



Smarter Cities Communities

Simplify IoT For Your Community



Cisco IoT Panelists



Chris Galo

Market Development
Manager



Melissa Swirski

Business Development
Manager



Konrad Reszka

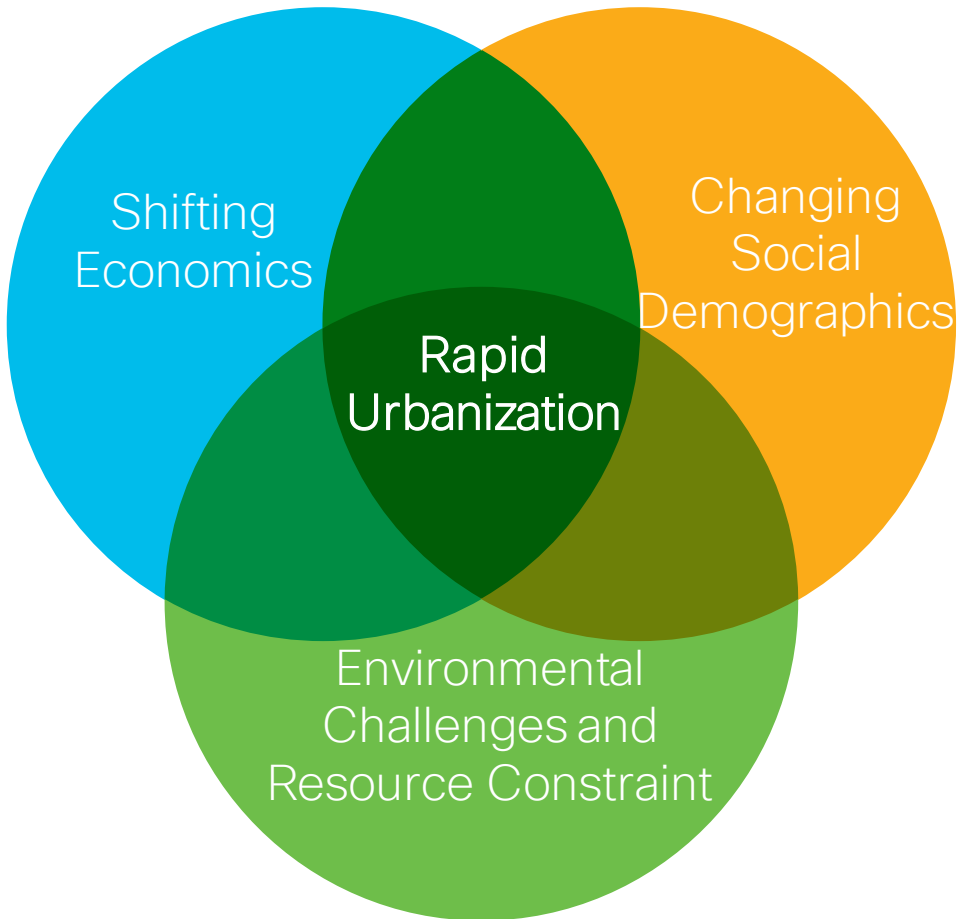
Systems Engineer

Agenda

- 1 Introduction
- 2 Kinetic for Cities
- 3 Foundational IoT Solutions
- 4 IoT Hardware Details

Cisco Kinetic for Cities

Global Trends Changing the Urban Landscape



Why Smart Cities?



Lighting

Up to **38%**

of overall municipal utility bill



Parking

30%

of traffic congestion is caused by drivers circling to find a space



Environment

\$1.7T

economic impact due to air pollution



Urban Mobility

\$300B

Annual cost of congestion for US drivers.
\$1400 per driver



Safety and Security

\$3.2T

annual cost of crime in the US, including both direct and indirect costs



Waste Management

60%

inefficiency in waste bin collection

Poll Question

Has your city started to define an IoT strategy?

- Yes, plans are being developed
- Yes, we have active projects
- No, not yet

Technology Challenges in Smart Cities Deployment



Vertically integrated sensors

No standardization across sensors

Lack of cross-domain data and information sharing

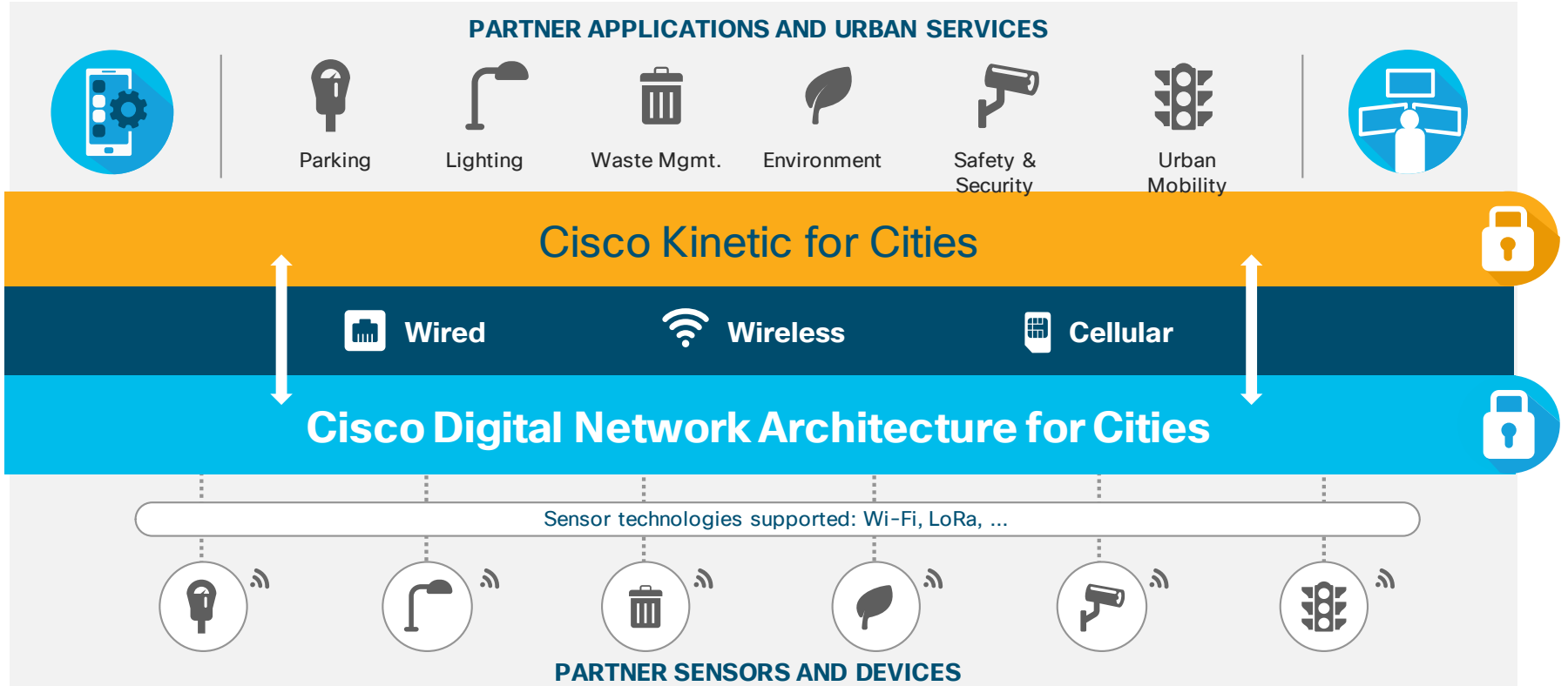
Fragmented application ecosystem

Cisco Kinetic for Cities

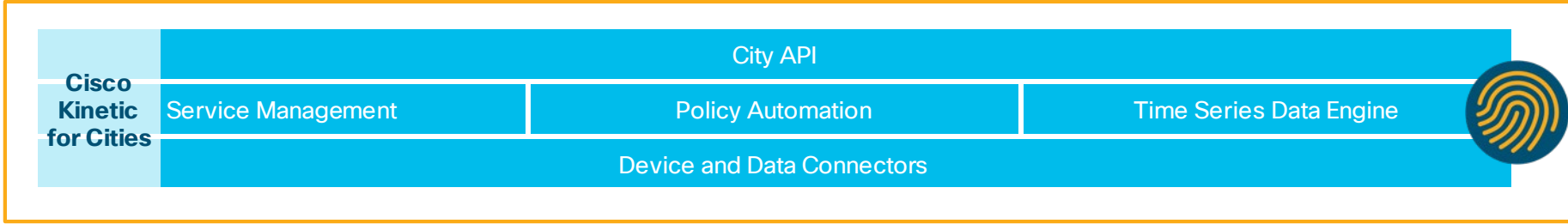


Manage your city
in the palm of your hand.

Cisco's Approach for Smart Cities



Cisco Kinetic for Cities – What Does it Do



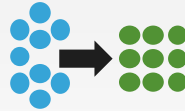
Data from any device



- Aggregate and normalize data across multiple sensors
- Digital Model for the City



Cross-domain information



- Enable cross-domain contextual control (ie. With outdoor lighting & crime)
- Process automation through policies

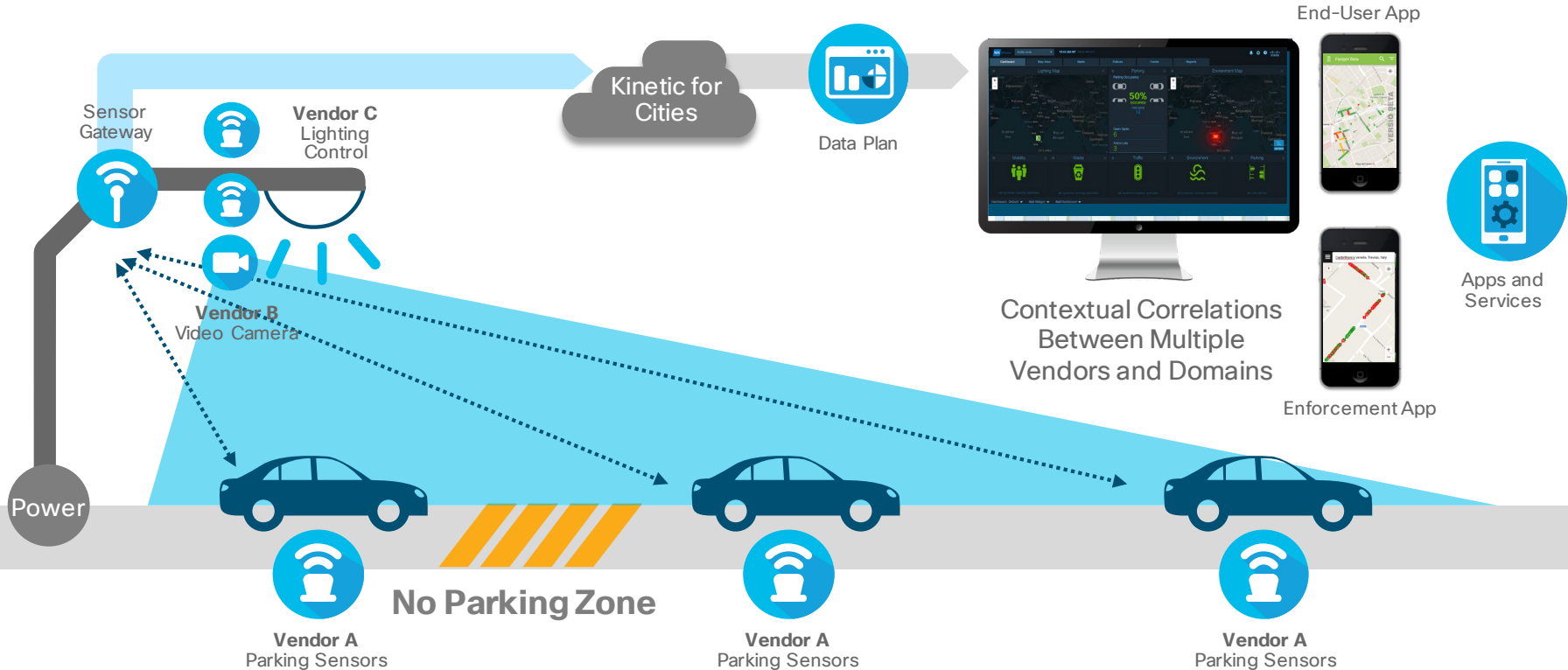


Open ecosystem

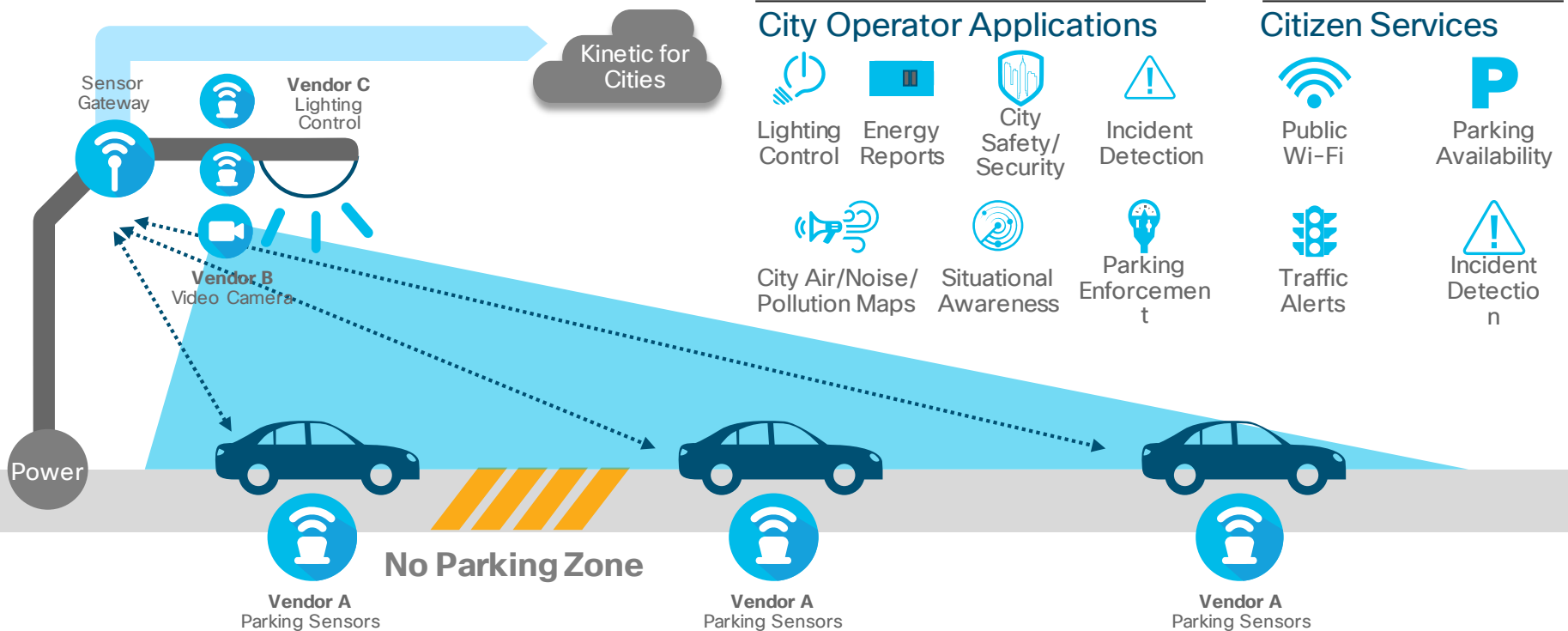


- Expose APIs for local and global ISVs Applications
- Secure Key Management and Role based access control

Across Myriad City Infrastructure Assets



Enabling Contextual Correlations Between Domains



Cisco Kinetic for Cities 4.0

Features and Capabilities

Domain Capabilities

Parking

Poor parked vehicle (PPV)

Real-time Parking

Occupancy Availability

Real-time turnover information

Parking Guidance (Reference)

Parking Enforcement (Reference)

Parking Policies:

- Fare
- Overstay
- No-parking zone
- Loading/Standing zone

Reports

- occupancy, session, turnover reports

Lighting

Scheduling Model (Cimcon)

Fault Model & Power Meter parameters (Cimcon)

Lighting Control:

- Change of status (On/Off/Dimming)
- Dimming Percentage
- Energy Use
- Power Status
- Visualization of Lights
- Schedule Definition – time based schedule

Reports

- Energy Usage Reports (Estimated)

Environment

Air Quality Index (AQI)

- Color Code
- Remarks

Provider based heat map visualization AQI/BAQI (Breezometer)

Moving Environment Sensing (PAQS)

Structural/Vibration Monitoring

Air Quality Sensing (older APIs)

Pollution Playback in dashboard to view playback

Reports

- AQI, CO2, SO2, Lux, Noise, CO, Temperature etc. reports

Urban Mobility

Travel time

Vehicle classification and counting (Calculation improvements)

Vehicle, Pedestrian direction Device dwell time and count

Pedestrian, Vehicle count and classification

Average speed

Congestion

Distribution of Incidents

Reports

- Vehicle, Pedestrian count
- Dwell time

**Features listed in light blue = New with 4.0*

Domain Capabilities & Dashboard



Safety and Security (New)

Command and Control

- Alert > Validate > Act

Alerts

- Intrusion/Object detection
- License Plate Recognition
- Facial Recognition
- Slip and Fall Detection
- Fire and Smoke
- Loitering
- Queue Alert
- Perimeter Alert – intrusion within defined perimeter
- Wrong way Alert
- Crowd Alert

Reports

- Incidents Report



Waste Management (New)

Bin Fill Level Monitoring

Bin Overflow Alert

Fire Alert

Visualization of collection routes

Tracking of Garbage Trucks

Reports

- Fill Level Trend
- Temperature/Battery Trend



Dashboard

Dashboard Personalization

Persistent Alerts and SOP Integration

Themes enhancement

Localization

Intuitive Dashboard view (Split view)

Search/Sort Sensors, Providers
Enhanced Reports (Slicing and Dicing)

Sensor, Street Layer Overlay

Polices and Events

Reports



Video (New)

Video wall capabilities
Ad-hoc camera views & controls

Customer Deployments

Midsize International City – Development Authority

Business Objectives

- Bridge Digital Divide
- Enable Citizen Engagement
- Improve Public Safety

Solutions

- Cisco Digital Network Architecture for Cities
- Cisco Kinetic for Cities Lighting, Parking, Environment monitoring, and Safety and Security
- Municipal Citizen App

Business Outcomes

- 2000 citizens on Wi-Fi everyday
- Improved government service delivery



The vision for the city is to digitally empower every citizen to enhance the quality of life, enable ease of doing business in the state and become an innovation and knowledge hub of the country. 'Digitization is a powerful platform to realise that vision. We envision the city as a role model for digital transformation for other states to follow. The city recognizes the effort of Cisco to help us lead in this transformation.

Municipal Chief Minister (City Manager)

Kansas City, Missouri

Improving production with communications and Insights

Business Objectives

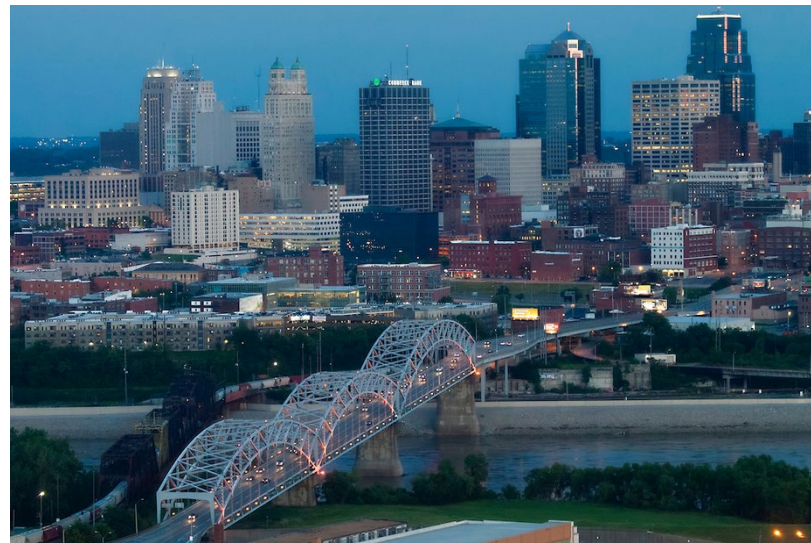
- Deliver a new generation of urban services for city agencies, citizens, and businesses
- Create scalable, repeatable, and self-sustainable framework

Solutions

- Cisco Digital Network Architecture for Cities, Cisco Kinetic for Cities, Cisco Kinetic for Cities Lighting with Cisco Kinetic for Cities Nodes, interactive digital kiosks, smart water initiatives
- An open data portal that gathers and shares information across a network of sensors and services.
- Partners: Sprint, Sensity, XAQT and others

Business Outcomes

- Thought leadership position as a smart city - Shortlisted for USDOT's Smart City challenge
- Target energy savings of 50% in lighting



“The Cisco Kinetic for Cities Lighting will improve the livability, connectivity, efficiency and economic vitality of Kansas City in ways we cannot yet even imagine, and for generations to come”

Sly James, Mayor
Kansas City, MO

Realizing the Benefits

Cisco Kinetic for Cities Key Differentiation



Platform Approach

- Vendor agnostic
- API's and information data models
- Event response paradigm
- Pay as-you-grow



Multiple Domains

- Use cases across
Lighting,
Parking,
Environment,
Waste Management
Urban Mobility ,
and Safety and Security



Security

- Secure, end-to-end architecture
- Data encryption
- Cloud security
- API management



Ecosystem

- Enabling application developers to provide differentiated Urban Services experiences for Cities and Citizens
- Integrated, certified sensor vendors with global reach



Network

- End-to-end solution validation with CVD
- Best-in-class Security

Creating Shared Value



CITY AGENCIES

Optimizes operations through real-time data intelligence and intra-agency collaboration; more citizen engagement.



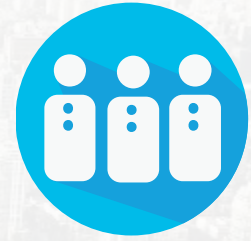
CITIZENS

Provides city services through visibility into real-time city data, including mobility, connectivity, safety and other key services for improving elements of daily life



BUSINESS

Drives new revenue streams and economic development by enhancing awareness of customer activity and behavior



DEVELOPERS AND VENDORS

Fuels application development of city data to help cities improve operational efficiencies, engage citizens and boost economic viability



Foundational IoT Solutions for Smarter and Connected Communities

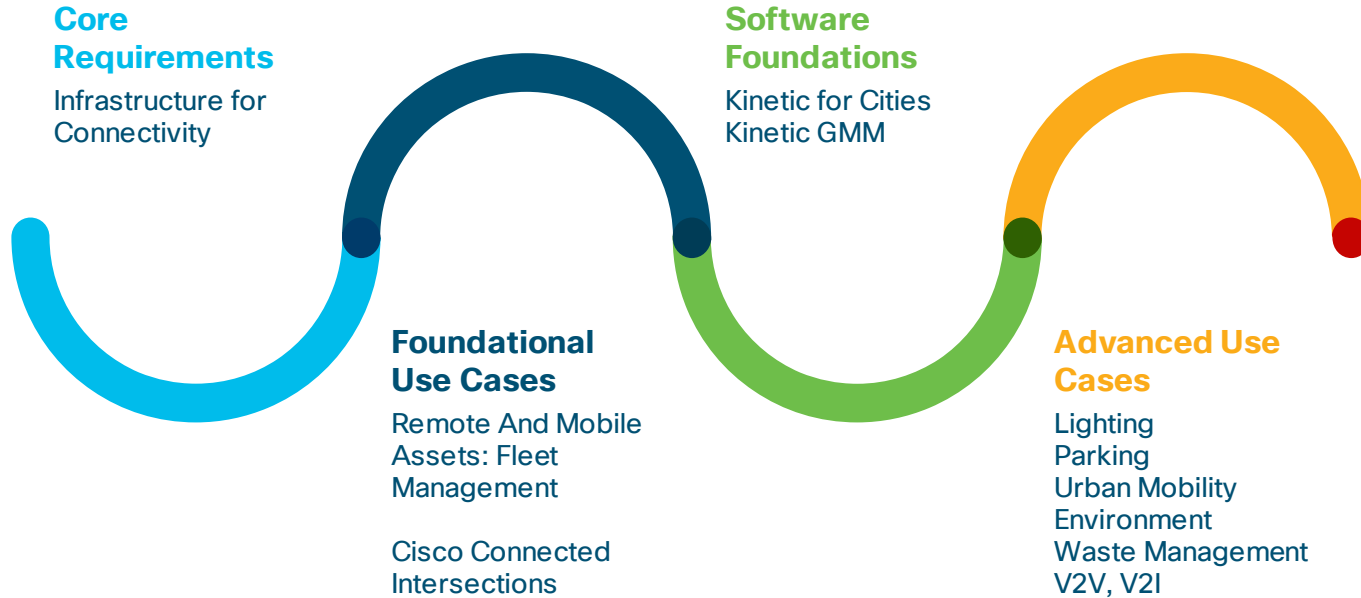
Public Sector Solutions

Melissa Swirski

Business Development Manager, IoT

May 2019

Smart & Connected Cities Journey



U.S. Fast Facts



- There are over 40,000 traffic related deaths every year that cost **\$413 billion**
- **6,000** pedestrian deaths each year
- **6 billion gallons** of wasted fuel
- **300,000+** signaled traffic intersections
 - 1 signalized intersection for every 1,000 citizens
- Much of the install base is nearing EoL and requires upgrades
- Federal **funding is available** for cities to upgrade infrastructure to smart intersections



Poll Question

Is your community concerned about funding an IoT initiative?

- Yes, we need to research alternatives
- No, we currently have funding

IoT Landscape

1

Extended Enterprise

- IT buyer
- Horizontal play



Airports



Roadways



Warehouses &
Distribution
Centers



Ports

2

Remote & Mobile Assets

- IT implements for OT outcomes
- Horizontal play



Fleet



Kiosks



Public Safety
Fleets



Intersections



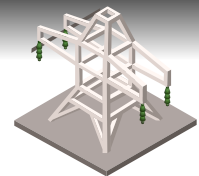
3

Industry Plays

- Validated use cases for OT/LoB
- Typically, vertical-specific



Factories



Utilities

Why Cisco Connected Intersections?

A Logical First Step To Becoming A Smarter Community



Decreased
Travel Time



Reduced
Accidents



Facilitate green tunnels
(fewer stops)



Leverage assets
already deployed
(decreased costs)



Improve
environmental impacts
(decrease in emissions)



Paves the way for
V2I and V2V
communications



Smart lighting, video
surveillance, environmental
sensors, and Wi-Fi

Use Case: Traffic Cabinet

Intersections, On Ramps, Roadway Corridors



Needs

- Improved Operation
- Improved Safety for motorists and pedestrians



Solution Capabilities

- Secure connectivity with simple deployment
- Remote diagnostics and troubleshooting
- Secure, reliable, redundant and high bandwidth Gigabit Ethernet connectivity and can be DIN-rail mounted in a field cabinet



Solution Benefits

- Comprehensive security
- Simple to deploy and manage
- High availability and reliability

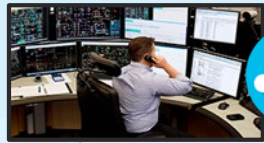
Poll Question

On a scale of 1-5, is traffic congestion a problem for your community?

- 5 - Traffic is a major issue
- 4 - Traffic is frequently congested
- 3 - Traffic is sometimes an issue
- 2 - Traffic is seldom an issue
- 1 - Traffic is never an issue

Use Case: Fleet Management

Police, EMS, DOT



Needs

- Reduce fuel costs, carbon footprint
- Increase access to applications
- Increase fleet uptime



Solution Capabilities

- Secure connectivity with simple deployment
- Remote diagnostics and troubleshooting
- Track speed, idle time, location
- Geo-Fencing alerts
- Optimize preventative maintenance
- Replacing multiple device SIMs with Wi-Fi hotspot
- Video surveillance



Solution Benefits

- Comprehensive security
- Simple to deploy and manage
- Vendor Agnostic
- Typical ROI is achieved in less than 1 year

Case Studies

Cary, NC

- Living Lab At Community Center
- 240 Connected Intersections

County In FL

- 120 Intersections

Large City In TX

- 1,400 Intersections
- 1,500 Police & Fire Vehicles

IoT Hardware Details

Konrad Reszka
Systems Engineer

Cisco IoT Portfolio



Energy



Transportation



Manufacturing



Public Sector

Industrial Switching



IE 1K,2K,3K,4K,5K,
CGS

IoT Gateways



IR809, 829, 819H

Industrial Routing



ASR 902/903,
CGR 1000, CGR 2000

Industrial Wireless



AP1552, AP1572,
IW3702

Embedded Networks



ESS, 5900 ESR
5921 SW ESR

LoRaWAN



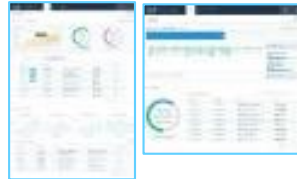
IXM-LPWA

Industrial Security



ISA 3000

Edge Computing



IOx
Fog Director

Management and Automation



Field Network Director
Industrial Network
Director

Kinetic



Edge & Fog Module
Data Control Module
Gateway Mgmt Module

Industrial Security Baseline

HARDWARE Mechanical & Sensors



Accelerometer
& Gyroscope



Input Alarm
for Digital Sensors



GPS Asset Tracking
& Geo Fencing



Sim Card
Locking Plate

HARDWARE Processors & Electronics



Trust Anchor Module
(ACT2 Chipset)



Fast Hardware
Based Encryption

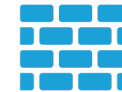


Digital Signage
Validation



Code Signage

SOFTWARE Applications & Resources



Application Level
Firewall



Secure Boot



Cisco Process
(CSDL, Vulnerability
Testing, PSIRT,
TALOS Group)



Hosted App
lifecycle security
with Cisco IOX*

IoT Gateways



IR 807

Features

- Compact
- Low power consumption
- Integration with SCADA
- Utility Certifications

Rugged

IP30  60° C
-40°

Positioning



Utilities



Roadside



Kiosk



IR 809

- Edge compute
- Integrates with SCADA
- GPS, Acc., Gyro
- Utility Certifications

IP30  60° C
-40°



Utilities



Oil & Gas



ATM



IR 829

- Single/Dual LTE
- Storage & Edge Compute
- Ignition Power Management
- PoE, mSATA
- GPS, Acc. & Gyro
- Industrial & Automotive Cert.

IP40  60° C
-40°



Public Safety



Mass Transit



Remote Asset

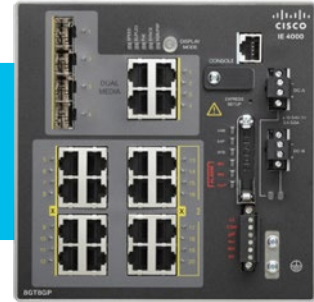
Industrial Ethernet Switches

IE-2000



- 100 Mbps
- PoE+
- IP30 and IP67 (waterproof) variants
- Config on SD Card for easy setup and replacement
- Dry Contact Alarms

IE-4000



- 1Gbps
- PoE+
- IP30
- Dying Gasp
- TrustSec SGT, MACSec

IE Power Supplies

- IE Switches, some IR Routers require an external power supply
- Variety of PS options are available from 50W – 170W
- AC and DC input options available



Cisco 4G LTE Outdoor Antennas

ANT-5-4G2WL2G1-O



- 5-in-1 Antenna
- 2G/3G/4G Cellular
- GPS
- 2.4 GHz and 5 GHz WiFi
- Vehicular roof mounted, qualified for shock and vibrate standards

ANT-3-4G2G1-O



- 3-in-1 Antenna
- 2G/3G/4G Cellular
- GPS
- Vehicular roof mounted, qualified for shock and vibrate standards

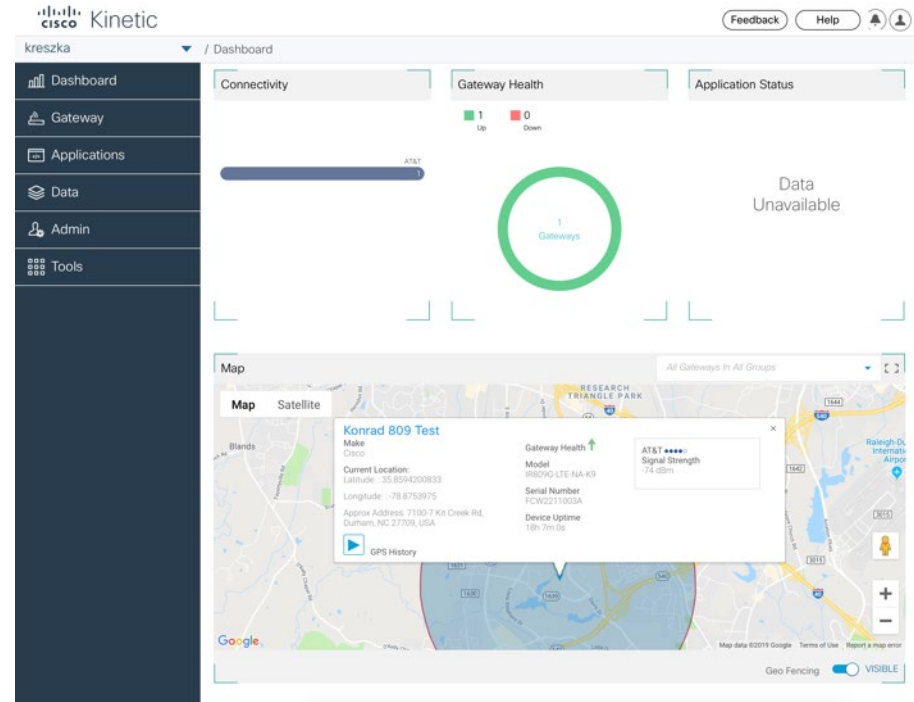
4G-LTE-ANTM-O-3



- Dual 4G LTE
- GPS

Kinetic GMM

- Gateway Management Module
- Automated gateway provisioning
- GPS tracking, history
- Geo fencing
- Alerts



RAMA Sample BoM

IR829	IR829 and Kinetic Essentials Cloud Bundle
KIN-ESS-CLOUD	Kinetic Essentials Cloud for Gateway Management
KIN-ESS-CLD-C	Kinetic Essentials Cloud for Gateway Management - Commit
KIN-ESS-CLD-O	Kinetic Essentials Cloud for Gateway Management - Overage
IOX-CLOUD	IOX App Management License
SVS-IOT-SUPT-BAS	Basic Support for IOT
IR829M-LTE-EA-BK9	829 Industrial ISR, LTE US,WiFi,POE,SSD connector,FCC
CON-SNT-IR829LKB	SNTC-8X5XNBD 829 Industrial ISR, LTE US,WiFi,POE,SSD
SL-IR800-SEC-K9	Security License for Cisco IR800 series routers
SL-IR800-IPB-K9	IP Base License for Cisco IR800 series routers
IR-SSD-BLANK	IR800 SSD Blank cover
SL-IR800-DATA-K9	Data License for Cisco IR800 series routers
IR-KINETIC-GMM	Enables gateway for Kinetic Gateway Management
CLOUD-MGMT-SWAP	Cloud Managed Cisco AP1530 Series Unified WiFi 8.1 Software
CLOUD-MGMT-S800	Cloud Managed Cisco IR800 Series UNIVERSAL
ANT-5-4G2WL2G1-O	5 in 1 outdoor antenna- 4G/LTE-2, WLAN-2, GPS-1
IR829-PWR125W-AC	PWRSPLY AC/DC for IR829
IR-PWR-G2A-NA	IR800 G2A Power Cords - North America

Connected Intersection Sample BoM

IE-2000-16PTC-G-L	POE on LAN Lite base. GE uplinks
CON-SNT-IE2001GL	SNTC-8X5XNBD POE on LAN Lite base. GE uplinks
SD-IE-1GB	IE 1GB SD Memory Card for IE2000, IE3010
PWR-IE170W-PC-AC=	IE family power supply 170W. AC to DC
IR807	IR807 and Kinetic Essentials Cloud Bundle
IR807G-LTE-NA-K9	807 Low-power Industrial ISR, 4G/LTE multimode for N.America
CON-SNT-IR807GLN	SNTC-8X5XNBD 807 Low-power Industrial ISR, 4G/LTE mul
IR-KINETIC-GMM	Enables gateway for Kinetic Gateway Management
FW-WP7500-LY	Additional FW for WP7500
SL-810-ADVSEC	810 Series Advance Security Software License
SL-810-AIS	810 Series Advance IP Services License
FW-WP7504-AT	FW for WP7504 AT&T
4G-LTE-ANTM-O-3-W	4G LTE 3 in 1 outdoor White antenna 700MHz-2600MHz bands
CLOUD-MGMT-S807	Cloud Managed Cisco IR807 UNIVERSAL
4G-CAB-LMR400-10	10-ft (3M) Ultra Low Loss LMR 400 Cable with TNC Connector
IR807-DINRAIL	Din Rail kit for the IR807
S807UK9-15803M	Cisco IR807 IOS UNIVERSAL
KIN-ESS-CLOUD	Kinetic Essentials Cloud for Gateway Management
KIN-ESS-CLD-C	Kinetic Essentials Cloud for Gateway Management - Commit
KIN-ESS-CLD-O	Kinetic Essentials Cloud for Gateway Management - Overage
IOX-CLOUD	IOX App Management License
SVS-IOT-SUPT-BAS	Basic Support for IOT
PWR-IE50W-AC=	IE3000/2000 AC Power Module (updated)

Questions?

Helpful Links & Resources

Cisco.com:

Search: Cities and Communities

Cisco Team:

Chris Galo, MDM
Melissa Swirski, BDM
Gio Soto, BDM
Konrad Reszka, IoT SE



What Is The Opportunity?

Untapped opportunity selling familiar architecture



Expand footprint with familiar IT Buyer



Open the door to the OT Buyer



Increase wallet share by 10-25%



Customer Persona: Elected & Appointed Officials

Who they are

- Mayor / City Manager / County Executive / City Council / County Legislature
- Lead initiatives for job creation and economic development, innovation, education, healthcare, public safety and environmental issues.

How their success is measured

- Accountability and responsiveness to the citizens' needs
- Foster local business growth and job creation
- Optimal use of available funds and expedient & responsible management of finances
- Programs and services to enhance citizens' quality of life
- Environmental stewardship into city planning

What they care about

- Making cities competitive and safe, cater to all classes of citizens; safer streets and neighborhoods
- Create a new digital epicenter
- Motivate new buying centers to join the digital revolution; provide an opportunity to private sector and make it part of the consortium
- Economic opportunity and improved digital access for citizens
- Improved citizen compliance
- Create interdepartmental partnerships
- Improved revenue from city services

Mayor Sheila Jackson





Customer Persona: City Department Heads

Who they are

- Head of Procurement / Transportation / Transit / Traffic / Economic Development Sustainability / Chief of Police / Sheriff / Head of Fire Department / Head of Parking Administration
- In pursuit of City's vision, plans, develops, maintains and manages the respective local government services
- Provides leadership for future by conducting research and development and by formulating plans, programs, guidelines, and standards.

Roles & Responsibilities

- Day-to-day management of department or agency
- Budget management
- Staff recruitment and retention

What they care about

- Timely provisioning of citizen services at high standards
- Optimal utilization of existing assets
- Covert old cost-center assets into revenue-generating assets
- Lower operating & maintenance costs
- Leveraging the available current & historical data to inform future budgeting decisions

How their success is measured

- Improve public trust through strong management practices that ensure services quality and leverage all available resources.
- Improve economic stability, employment and self-sufficiency
- Improve the status of vulnerable population
- Improve individual and public safety

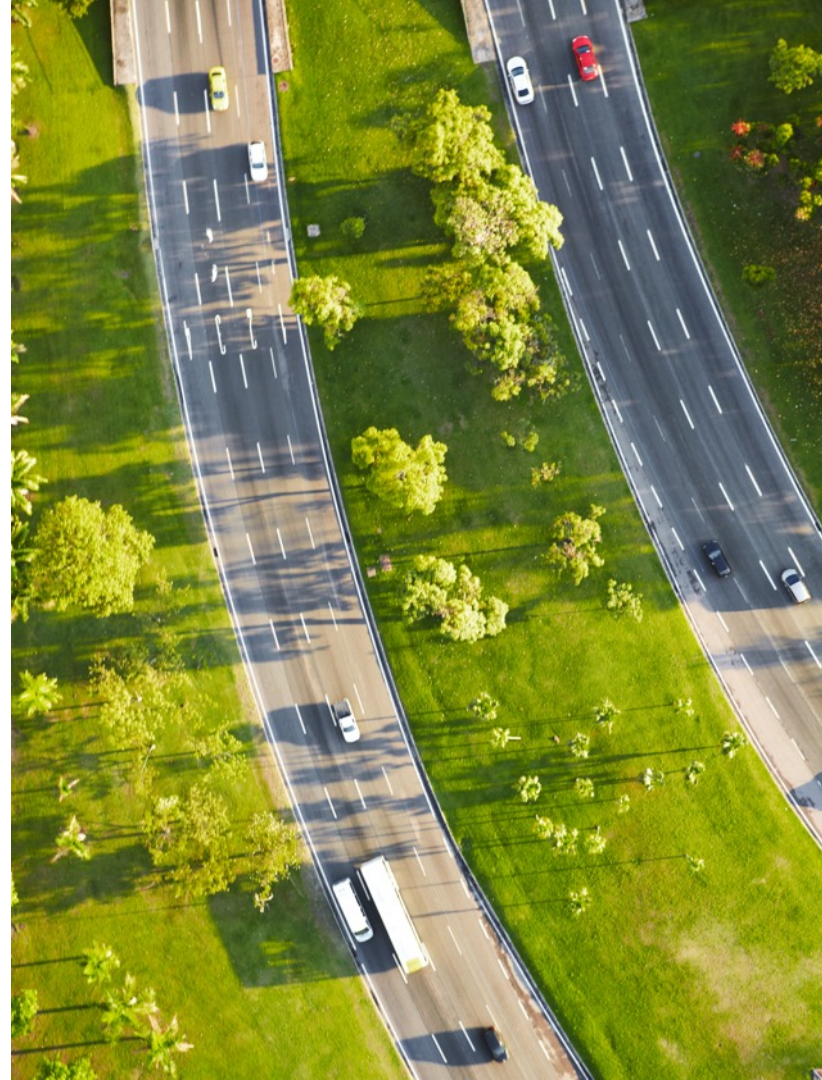
Getting the Conversation Started



- *What is your city doing to address outdoor connectivity?*
- *Outside of your IT team, who is interested in developing a strategy for a smarter community?*
- *How are your city's intersections managed today?*
- *How many intersections does your city have?*



- *How are you connecting, managing your police and fire vehicles?*
- *Do you own or lease these vehicles?*
- *Do the solutions you have today meet the department's requirements?*
- *How many EMS vehicles are in your fleet?*



Who to call on for Connected Intersections

State, Municipal, City DoT & Transit Agencies



Safety Engineer (DOT)

- Responsible for infrastructure and behavioral solutions that may improve safety
- Additional safety stakeholders may include: Police, EMS, and/or Fire Departments



Chief of Operations and ITS

- Traffic management
- Standardize network infrastructure
- Standardize real-time road status information platform



Chief Engineer

- System design, management, and primary adviser to CEO
- Strong industry relationships including relationships with consultants



Chief of Operations

- Manages Intelligent Transportation Systems division, including:
 - traffic electrical systems
- responsible for technology deployment on the highway network



CIO

- Support the business with technology
- Maintain cyber security
- Consolidate disparate networks
- Lower infrastructure TCO



District Engineer

- Run the business of the District, including transportation network and staff



Director of Planning and Programming

- Run the business of the DOT, including the transportation network and staff
- May be political, but expected to engage in high-profile projects



Deputy Directors for Planning & Data Mgmt

- Data and analytics
- Develop short- and long-range investment plans
- Regional coordination with MPOs and COGs

Private Sector and Stakeholders



Transportation Consultants

- On-call contracts – maintain billability
- Improve asset utilization
- Find new business models
- Consolidate disparate networks



OEM, Tier 1 Car, Bus, and Truck Manufacturers

- Incorporate V2V and V2I communications
- Increase passenger safety, comfort, and connectivity
- Reduce risk



Systems Integrators

- Reduce complexity and risk
- Stay on time and on budget
- Ensure regulatory compliance



Industry Associations

- AASHTO, ITE, ASCE
- Public and private sector organizations that “lobby” for transportation investment and standards



Buyers Personas

[Full profiles here](#)

Stakeholder	Elected Officials & Appointed Leaders	Chief Information Officer (CIO)	Agency & Department Heads	Emerging Leaders (i.e. Chief Digital Officer)
Insights	<p>Talk track – why meet with a technology company?</p> <ul style="list-style-type: none">➤ Nearly a third of urban leaders identify improving physical and digital infrastructure as a primary concern in order to provide residents with better public services and a better place to live.➤ Tailored value prop: Securely connecting everything is at the core of everything we do at Cisco. The network will be the platform for which innovation and change will be made possible.	<p>Talk track – championing the digital transformation agenda</p> <ul style="list-style-type: none">➤ The amount of connected things, people, and processes have grown exponentially and will only continue to explode. It will be imperative to manage, protect and learn from the volumes of data generated by that connectivity.➤ Tailored value prop: We can help ensure sovereignty over resident and community data, all while securing it across the entirety of the network.	<p>Talk track – keeping people and places safe</p> <ul style="list-style-type: none">➤ Evolving risks threaten the safety and security of communities all over the world. Meeting growing public safety challenges is not easy, but technology is force-multiplier for successful mission outcomes.➤ Tailored value prop: Cisco-enabled secure connectivity and collaboration allow your personnel unprecedented capability to serve the public from the scene of an incident, to the emergency vehicle, and back to the station.	<p>Talk track – Cisco's digital value v. competitors</p> <ul style="list-style-type: none">➤ Today's technology landscape is littered with companies offering products for innovation. But how can you be guaranteed that the money spent on digital infrastructure won't be wasted or become obsolete as new, better solutions enter the market?➤ Tailored value prop: The network will be the foundation and future of your digital vision. Cisco's Digital Network Architecture (Cisco DNA) is constantly learning, continually adapting, and consistently protecting, giving you the tools needed to achieve your digital aspirations now and for decades to come.