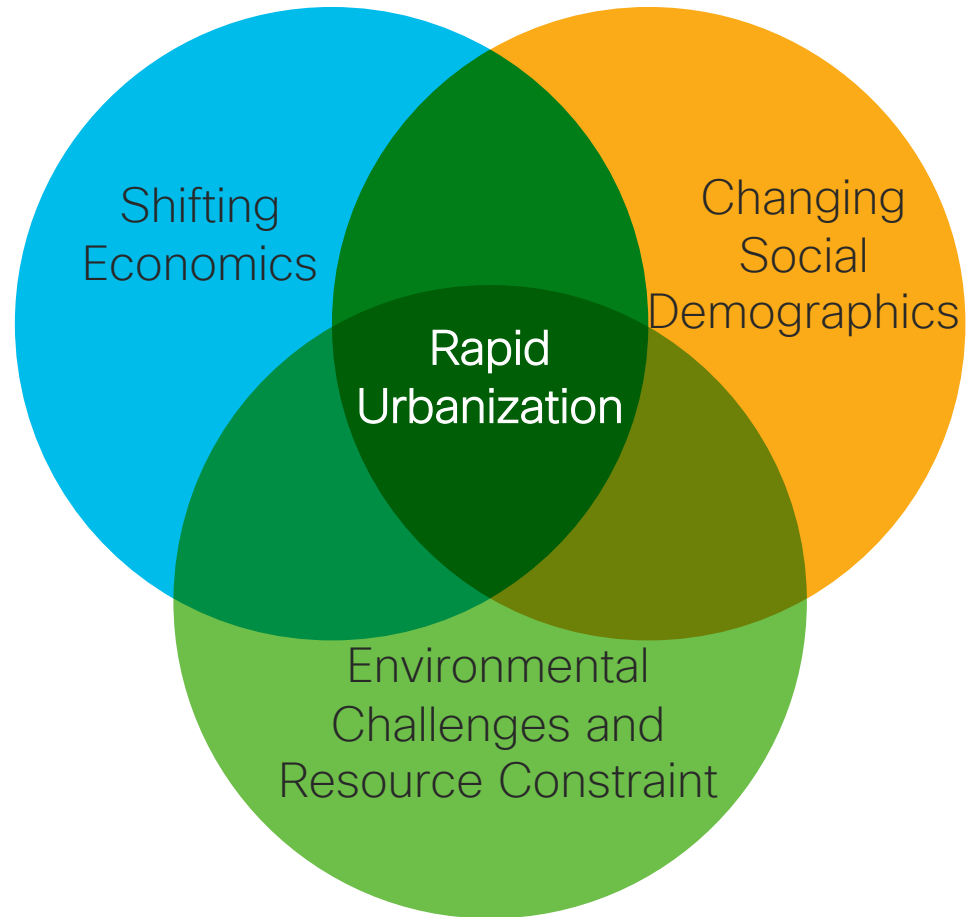# Brave New World! Cisco experience for developing Smart Cities

Nazim Latypayev

nlatypae@cisco.com

January 2019

Global Trends Changing the Urban Landscape

Shifting Economics

Changing Social Demographics

Rapid Urbanization

Environmental Challenges and Resource Constraint

# 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

# Cities Have Traditionally Addressed These Issues in Silos

**Safety and Security**

**Urban Mobility**

**Lighting**

**Environment**

**Parking**

**Waste Management**

Limited Sharing of
Infrastructure Costs and IT Resources

Limited Sharing of
Operational Insights

Missed Opportunities for
Synergies and Cost Efficiencies

This Fragmented Approach Is Inefficient,
Has Limited Effectiveness, Is Not Economical and Is Not Scalable

# Cities are Investing in Technology to Improve Urban Operations

**200 Million**
passenger journeys being connected in metros alone

**4 Billion**
streetlights need to get smarter

**1000**
cities investing into public safety connectivity solutions

**20 Billion**
parking spots need to get networked

**800K**
environmental sensors to be connected. >90% of world population living over AQI threshold

**1 Million**
Traffic Control Systems need to be networked to reduce traffic congestion

**100 Million**
points of data collection and control

By Harnessing the Power of Data…

# Cities Can Create a...

Service

Applications

FULLY CONNECTED COMMUNITY

Cisco Spark

Connecting Data

# Cisco Kinetic for Cities



Manage your city
in the palm of your hand.

# Cisco's Approach for Smart Cities



PARTNER APPLICATIONS AND URBAN SERVICES

Parking    Lighting    Waste Mgmt.    Environment    Safety & Security    Urban Mobility

Cisco Kinetic for Cities

Wired          Wireless          Cellular

Digital Network Architecture for Cities

Sensor technologies supported: Wi-Fi, LoRa, …

PARTNER SENSORS AND DEVICES
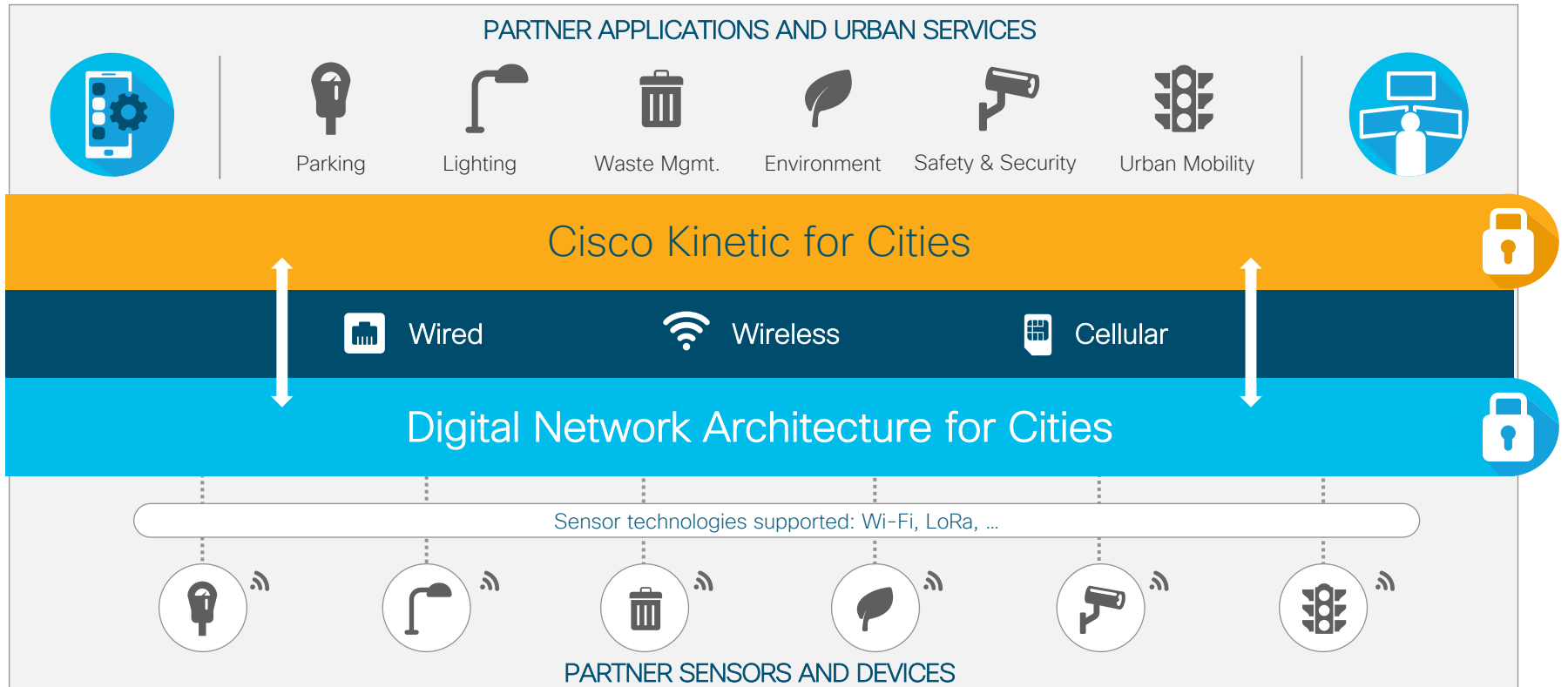
# Cisco Kinetic for Cities solution Architecture

**MOBILE APPS**

**KINETIC for CITIES DASHBOARD** monitoring/command control centers

## PARTNER APPLICATIONS AND URBAN SERVICES

| Transport Management | Water Management | Parking Management | Lighting Management | Waste Management | Environment | Safety and Security | Traffic Management |

## Cisco Kinetic for Cities

Wireless WAN (2G/3G/4G/ Wimax) DSRC/LMR

Public/Private WAN

Jasper

Actility

## Cisco Digital Network Architecture for Cities and Multisensor Network

## STREET

**CISCO and PARTNER SENSORS**

| Water | Parking | Street Lighting | Waste | Environment | Safety and Security | Traffic | People | Street Furniture |

# Cisco Kinetic for Cities – What it Does

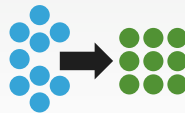| Cisco Kinetic for Cities | City API | | |
| --- | --- | --- | --- |
| | Service Management | Policy Automation | Time Series Data Engine |
| | Device and Data Connectors | | |
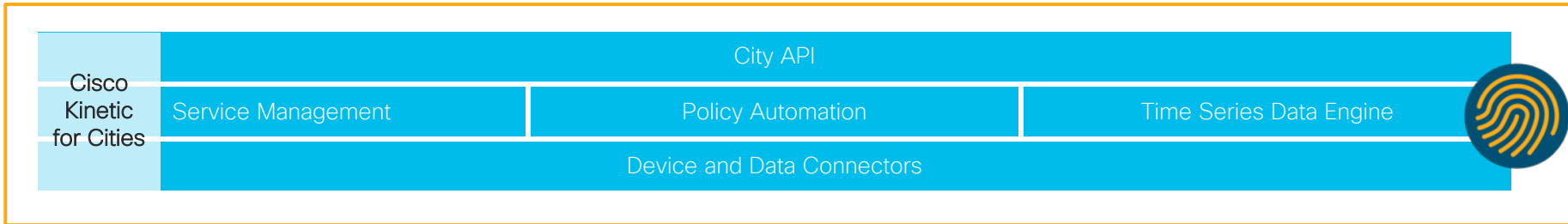
## Data from any device

- 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

Parking

# Parking Has Multiple Challenges

## CITY AGENCIES

Parking Revenue Loss

Severe Congestion (30% of Traffic)

Inefficient Resource Allocation
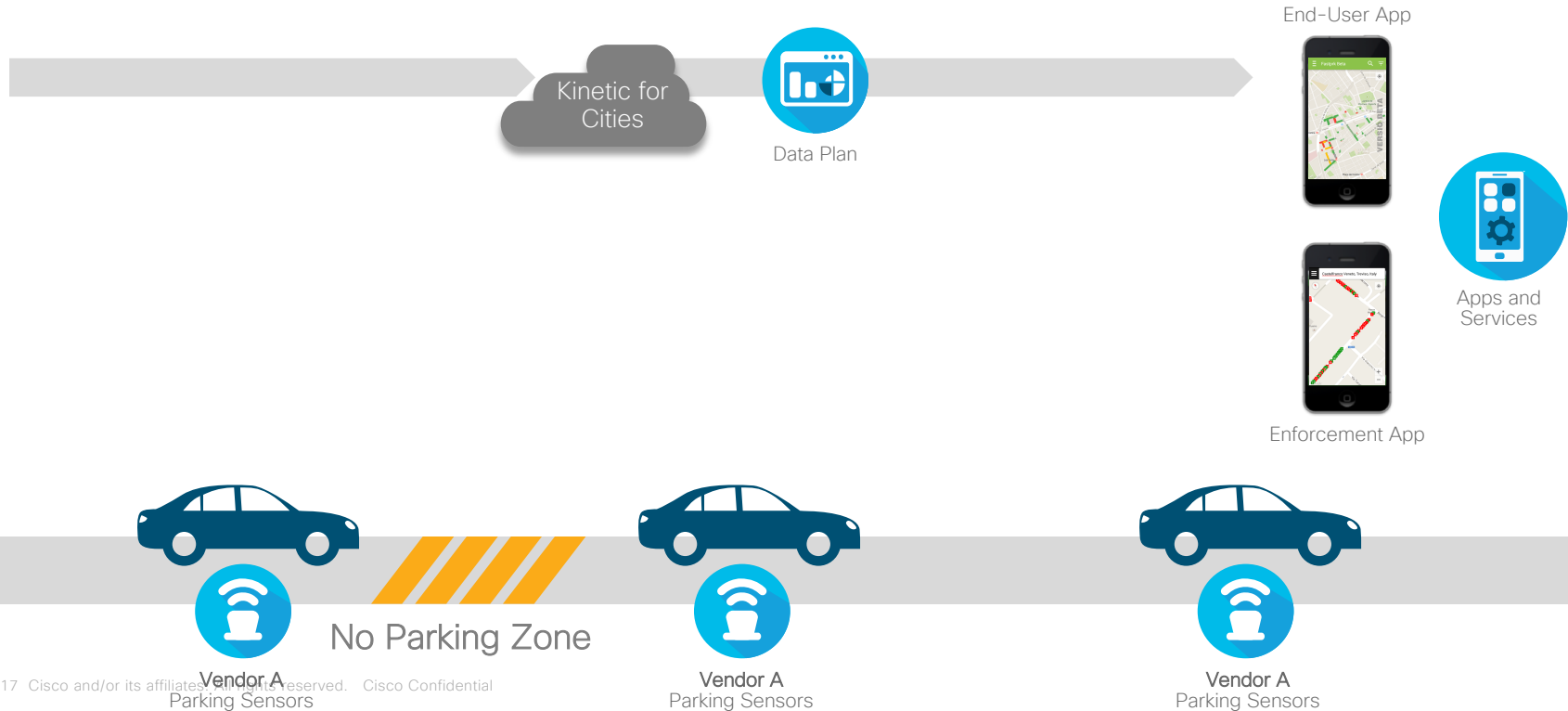
Damaging Environmental Impact

## CITIZENS

Significant Waste of Time

Economic Cost

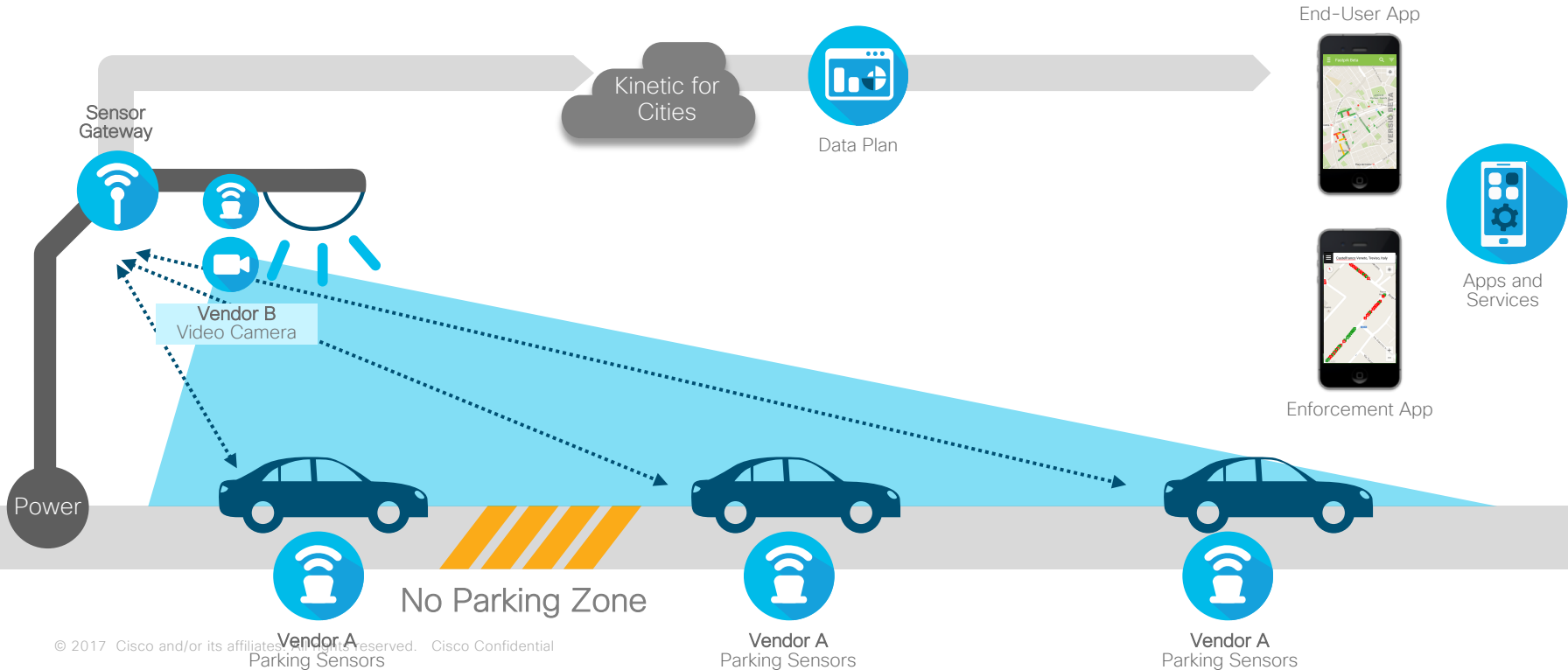Limited Payment Methods

Major Source of Frustration

## BUSINESS

Loss of Business Due to Lack of Parking

Customer Frustration

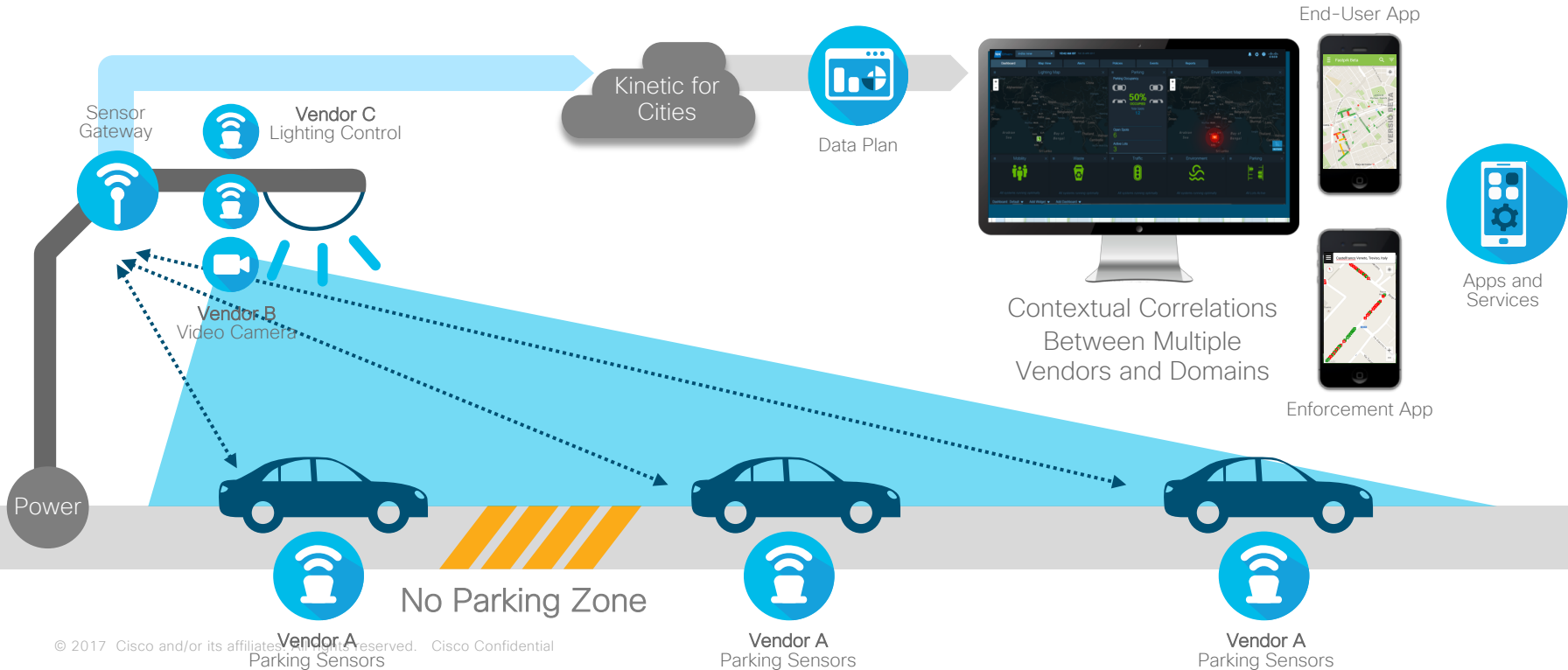Limited Ability to Influence (No Data)

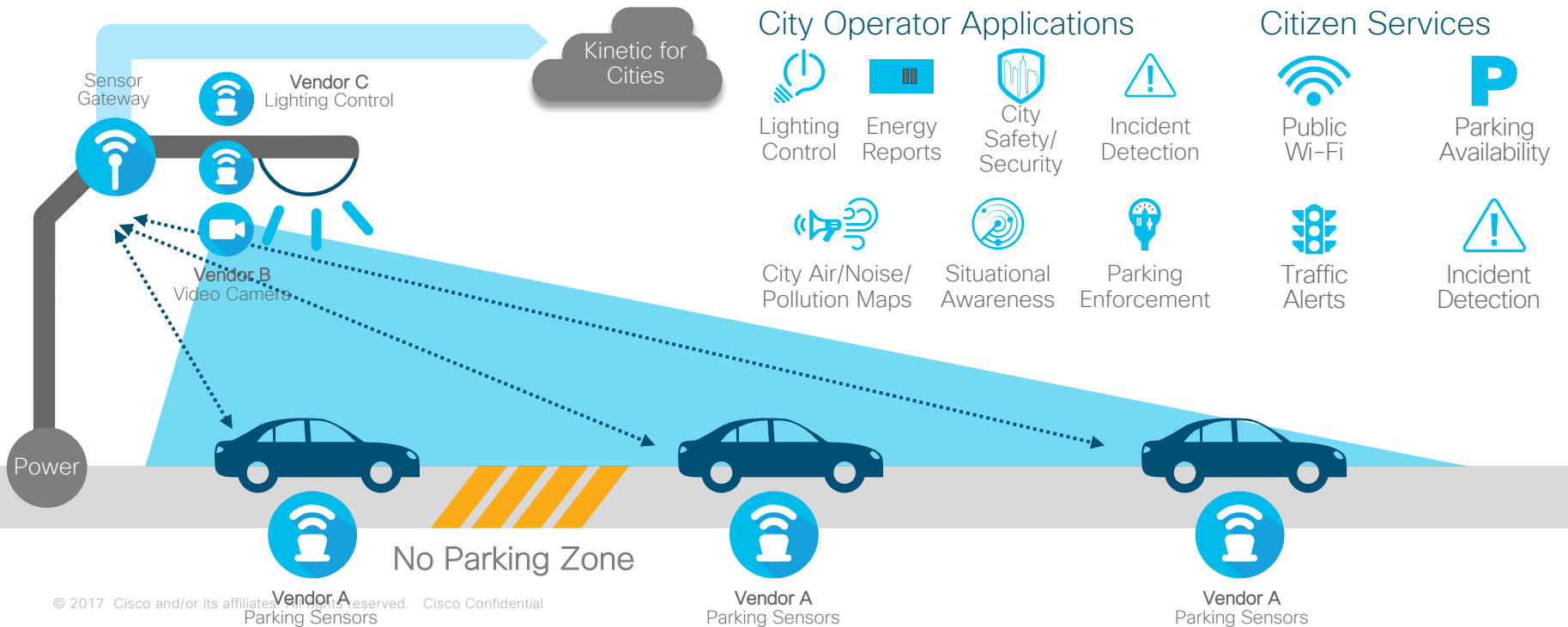# A Platform Approach Normalizes Data from One Sensor Type and Vendor…



End-User App

Data Plan

Kinetic for Cities

Apps and Services

Enforcement App

No Parking Zone

**Vendor A**
Parking Sensors

**Vendor A**
Parking Sensors

**Vendor A**
Parking Sensors

# to a Multi-Vendor Approach...



End-User App

Kinetic for Cities

Data Plan

Sensor Gateway

Vendor B
Video Camera

Apps and Services

Enforcement App

Power

No Parking Zone

**Vendor A**
Parking Sensors

**Vendor A**
Parking Sensors

**Vendor A**
Parking Sensors

# Across Myriad City Infrastructure Assets



Sensor Gateway

**Vendor C** Lighting Control

**Vendor B** Video Camera

Power

Kinetic for Cities

Data Plan

Contextual Correlations Between Multiple Vendors and Domains

End-User App

Apps and Services

Enforcement App

No Parking Zone

**Vendor A** Parking Sensors

**Vendor A** Parking Sensors

**Vendor A** Parking Sensors

# Enabling Contextual Correlations Between Domains



Kinetic for Cities

Sensor Gateway

Vendor C
Lighting Control

Vendor B
Video Camera

Power

No Parking Zone

Vendor A
Parking Sensors

Vendor A
Parking Sensors

Vendor A
Parking Sensors

## City Operator Applications

Lighting Control

Energy Reports

City Safety/ Security

Incident Detection

City Air/Noise/ Pollution Maps

Situational Awareness

Parking Enforcement

## Citizen Services

Public Wi-Fi

Parking Availability

Traffic Alerts

Incident Detection

# Cisco Kinetics for Cities – Digitizing City Operations

Lighting App

...... Parking App

Ex. Turn lights OFF when no cars detected in a Parking lot

API Management
Cross Domain API

API ...... API

- Parking Space State
- Parking Spot State
- Parking Rate
- ...

Lighting Data Model ...... Parking Data Model

Connectors ...... Connectors

Expose APIs for local and global ISVs
Secure key Management and Role Based Access Control

Aggregate and normalize data across multiple sensors
Enable cross-domain contextual control

Pre-integrated sensor connectors via secured connection

# Lighting

# Smart lighting solution transition

**Legacy Lighting**

- Higher Asset Lifecycle costs
- Lower Life Span
- Huge Maintenance Cost

**LED**

- 50% + Energy Savings
- Lower Lifecycle Cost
- 10+ Years Life span
- Reduced Maintenance Cost

**Networked LED**

- 20-30% incremental energy savings
- 50% R&M savings
- Continuous, accurate status and alerts.

**Converged Lighting Infrastructure**

- Occupancy based real time control
- Better quality of service, analytics and additional apps through REST APIs.
- Other Adaptive Light Control Use Cases
- Gateway to Multi-Sensing Use Cases

# Legacy lighting

Waste of real estate

---

Bad for the environment

---

Hard to maintain

---

Inefficient

---

Expensive

# Why Kinetic for Cities lighting?



ELECTRICITY PRICES BY COUNTRY, WORLD MARKETS

$US per kWh

Time

— France — Germany — Hungary — Ireland
— South Korea — United Kingdom — United States
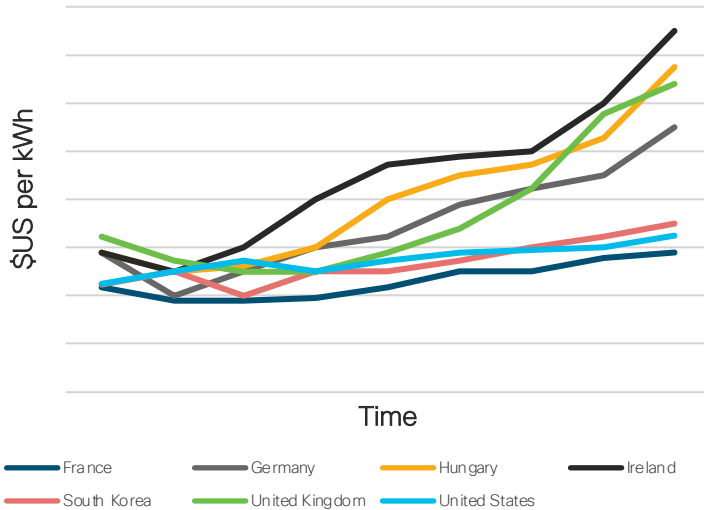


LED UNIT SALES AND PRICING

Unit sales in 000's

USD cost per unit

Time

— LED Lamp Unit Sales — LED Lamp Cost per Unit
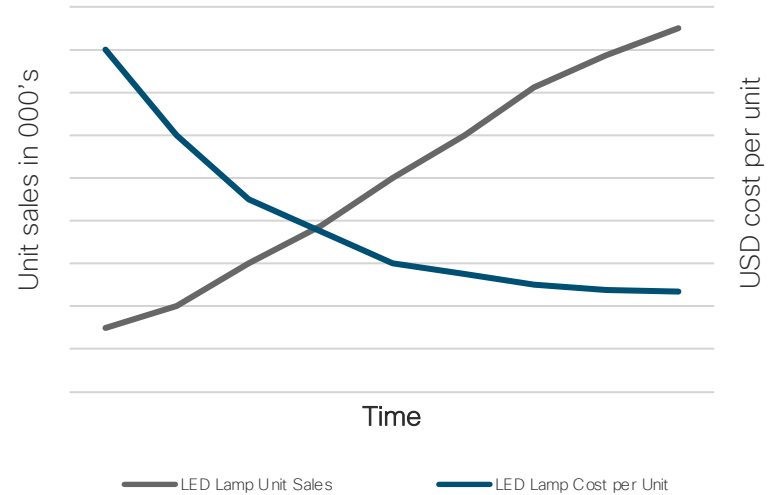
(Source: Energy Information Administration; International Energy Agency)

# Kinetic for Cities Lighting: Use cases



Visibility to all the Lights in the City
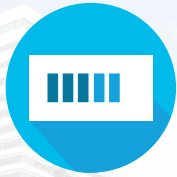
Metering

Scheduling Services

Group Control

Real Time Control

Fault Detection

Strobe
(Cross Vertical)

Fault / Potential Security Alert
(Cross Vertical)

Traffic and Weather Based Lighting Adaptation

Accident Based Lighting Adaptation

Intelligent Light Poles with Dynamic Signage

# Safety and Security

# Cost of Crime

## $3.2 TRILLION

Annual Cost of Crime in the US, Including Both Direct and Indirect Costs.*

* "The Cost of Crime" by David A. Anderson, Centre College's Paul G. Blazer Professor of Economics, Foundations and Trends in Microeconomics, Vol. 7: No. 3, published in 2012.

## The Cisco Kinetic for Cities Safety Solution

- Monitors location conditions

- Detects incidents early

- Responds to incidents effectively

- Uncovers criminal trends and patterns

# Key Stakeholders

## Public safety related agencies

Police Departments, Emergency Response, Sheriff's Offices, Fusion Centers, Homeland Security, Fire Departments

## Critical Infrastructure

Airport, Ports, Railway Stations, Museums, Hospitals, Utilities and Power Generation

## Businesses

Malls/Shopping Centers, Banks, Manufacturing, Retail Showrooms, Hospitality, Data Centers, Private Security Agencies,Campus

# Waste Management

# Introduction

| | |
|---|---|
| **1** | Solid waste management is increasingly becoming a critical issue for municipal authorities across the globe |
| **2** | Solid waste is a large source of methane, a powerful GHG that is particularly impactful in the short-term |
| **3** | Uncollected solid waste contributes to flooding, air pollution, and public health impacts such as respiratory ailments, diarrhea and dengue fever. |
| **4** | Collection costs represent 80 to 90% of the municipal solid waste management budget |
| **5** | In Developed Countries, More than 70% of containers are being picked up with very low fill levels |

*Src: World Bank, 2012*

# Waste Management Challenges

Unknown Waste Collection Patterns

Increased cost in Waste Collection and Maintaining Landfills

No Actionable Advice

Unpleasant Citizen Experience

Public Health Risk due to Overflowing, Unmanaged Waste Bins

Urban Decision Makers do not have Information to Drive Urban Development

Cities Cannot Track Generation and Disposal of Waste

# Built in to Cisco Kinetic for Cities Platform

## Cisco Kinetic For Cities

Aggregate and normalize data across myriad fill level sensors

Waste & Fleet management Digital Models for the City

Secured APIs for local and global ISVs Applications
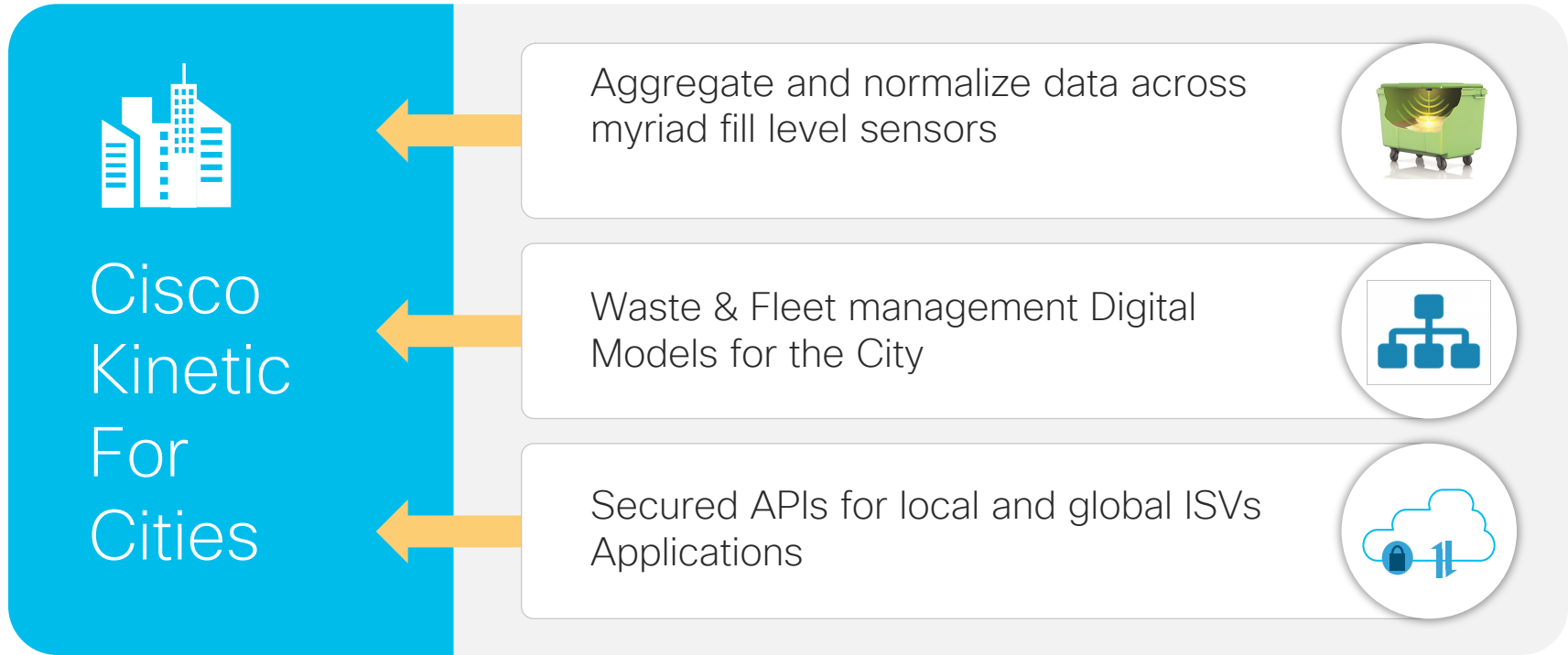
# Cisco Kinetic for Cities Waste Management: Capabilities

Visibility of all Waste bins (Sensors)

Fire Alert

Route Optimization of collection vehicles

Monitoring of waste collection vehicles

Fallen Bin Alert

Preventive Maintenance

Reports

Real-time tracking of vehicles

Weight of Waste generated

Note: Model supports over 60 attributes, However integration may not have all features supported based on API Capabilities of Partners

# How it All Works Together

# Cisco Kinetic for Cities Dashboard - A Single Pane for City Operations



CISCO

📍 Doll

07:32 AM
Saturday, September 17

Dashboard   Map view   Policies   Events   Reports

**Parking Occupancy**

29%
OCCUPIED

Open Spots
36

CO   NO₂   Temperature

**Carbon Monoxide**
☐ <=10 ppm   ☐ >10 ppm

11.1

-56.63   CO

Label : 2
Provider : Leapcraft

W

**Lighting**

Health: 100% - Excellent

*All systems running optimally*

**Parking**

Health: 100% - Excellent

*All systems running optimally*

**Urban Mobility**

Health: 100% - Excellent

*All systems running optimally*

**Environment**

Health: 50% - Poor

*All systems running optimally*

**Safety & Security**

Health: 100% - Excellent

*All systems running optimally*

**Waste Management**

Health: 58% - Poor

*All systems running optimally*

# Cisco Kinetic for Cities Dashboard: A Single Pane Across Use Cases

Jaipur ▼

**07:13 AM CEST**  SAT 25 NOV 2017

⊕ ENG ∨    🔔    ⚙    ❓    Kinetic For Cities

| **Dashboard** | Map View | Alerts | Policies | Events | Reports | SOP |

| Environment ✕ | Lighting ✕ | Parking ✕ | Traffic ✕ | Mobility ✕ | Safety & Security ✕ |

Health: 67% - Fair
*All systems running optimally*

Health: 71% - Fair
*1455 of 2031 lights active*

Health: 100% - Excellent
*All Lots Active*

Health: 100% - Excellent
*All systems running optimally*

Health: 100% - Excellent
*All systems running optimally*

Health: 100% - Excellent
*All systems running optimally*

## Environment Map ✕    Lighting Map ✕    Parking Map

Environment −

| AQI | CO | CO₂ | SO₂ | O₃ | NO₂ | PM₂₅ | PM₁₀ |

| Temperature | Humidity | Noise | Lux |

Air Quality Index

152

HEATMAP

Dashboard: Default ▼    Add Widget ▼    Add Dashboard ▼

# Customer Deployments

# Public WiFi in Almaty, Kazakhstan

**Concept:**

WiFi+ CMX:

- Increase attractiveness of pedestrian zones in the city;
- Platform for advertisement and feedback from the citizens;
- Big data for City Administration office analysis
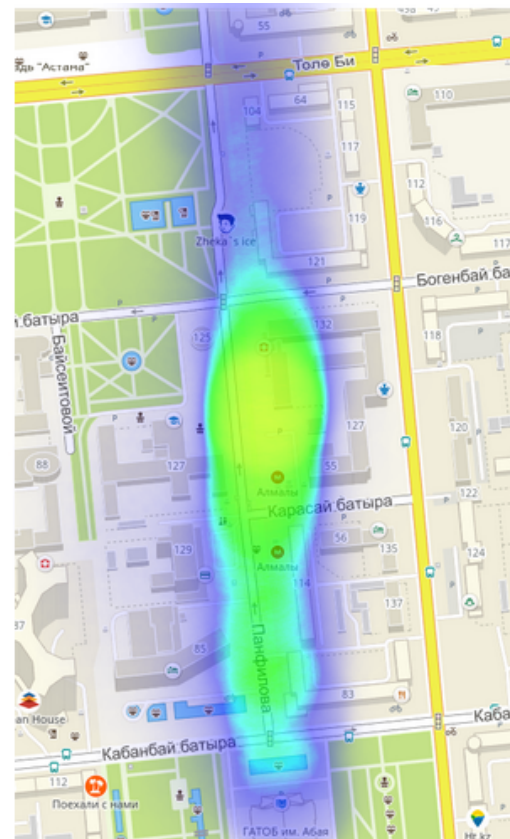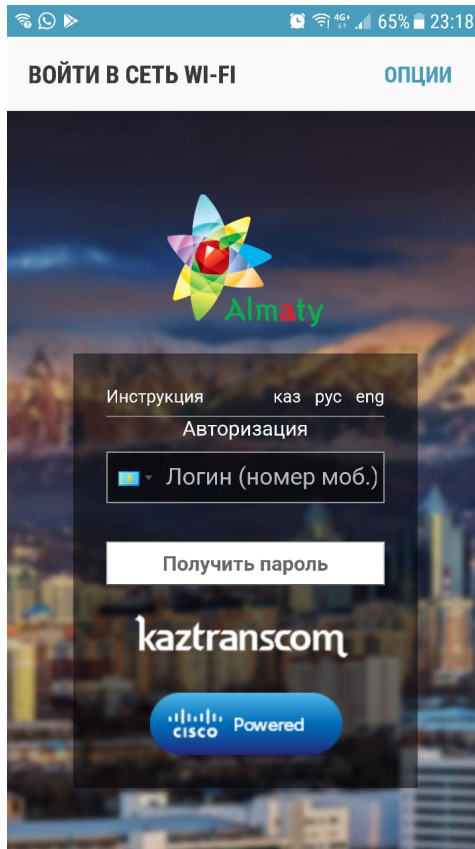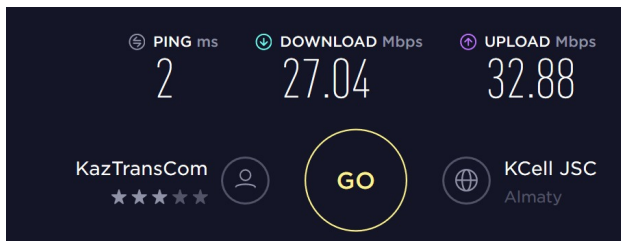
# Parking, Almaty, Kazakhstan
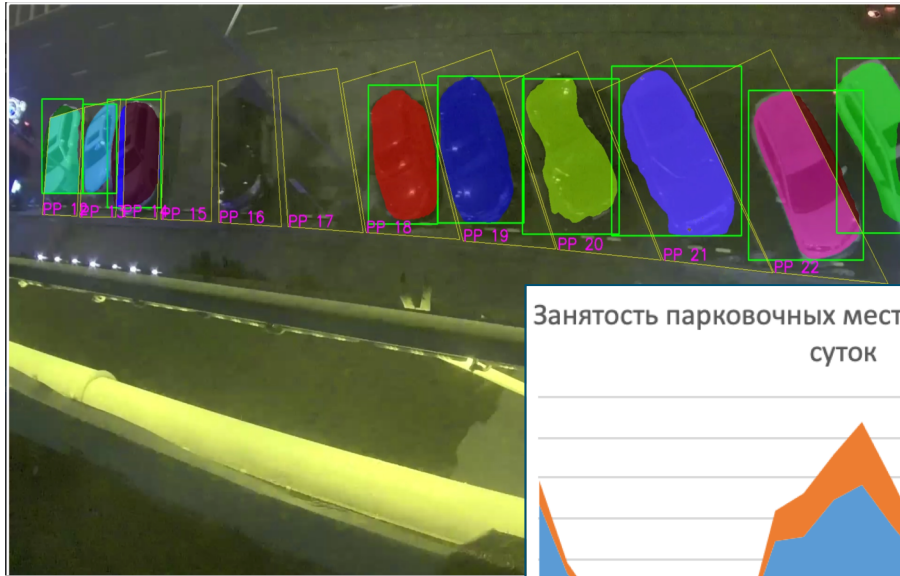


Статистика загрузки парковочных мест за период

Занятость парковочных мест в разрезе времени суток
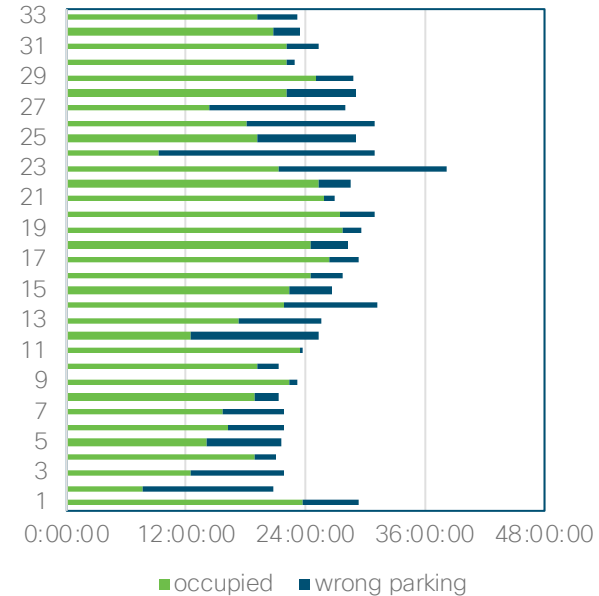
# Remote Services for Citizens

# Remote Services for Citizens

# Measuring City Health

Measure NO, $NO_2$, $SO_2$, $O_3$, PM 1, PM 10, PM 25, C, Rh, Db

Sample Air Every 2 Minutes

Easy Installation using Existing Power Sources (5w)

Benchmark with high accuracy against Air Quality Monitoring Stations
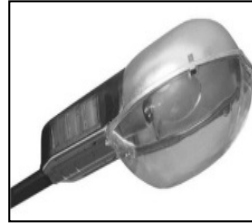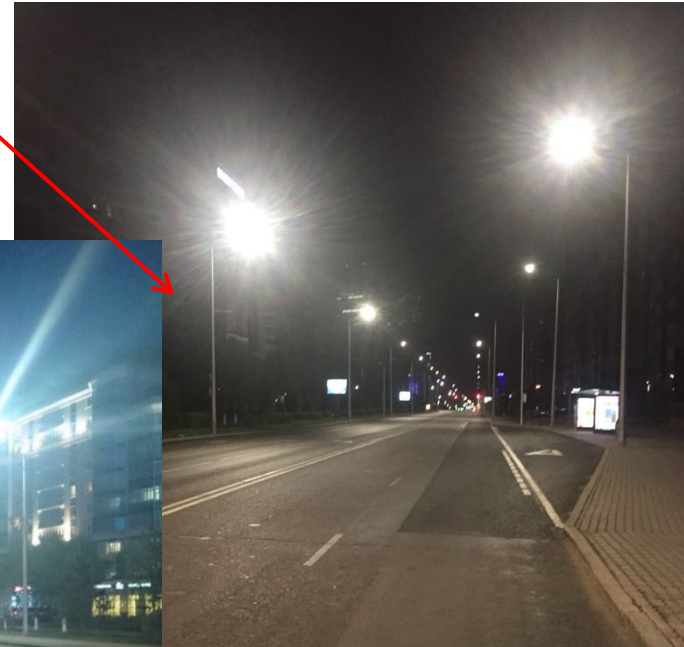
# Creating City Environment Heat maps



Source: https://airkaz.org/
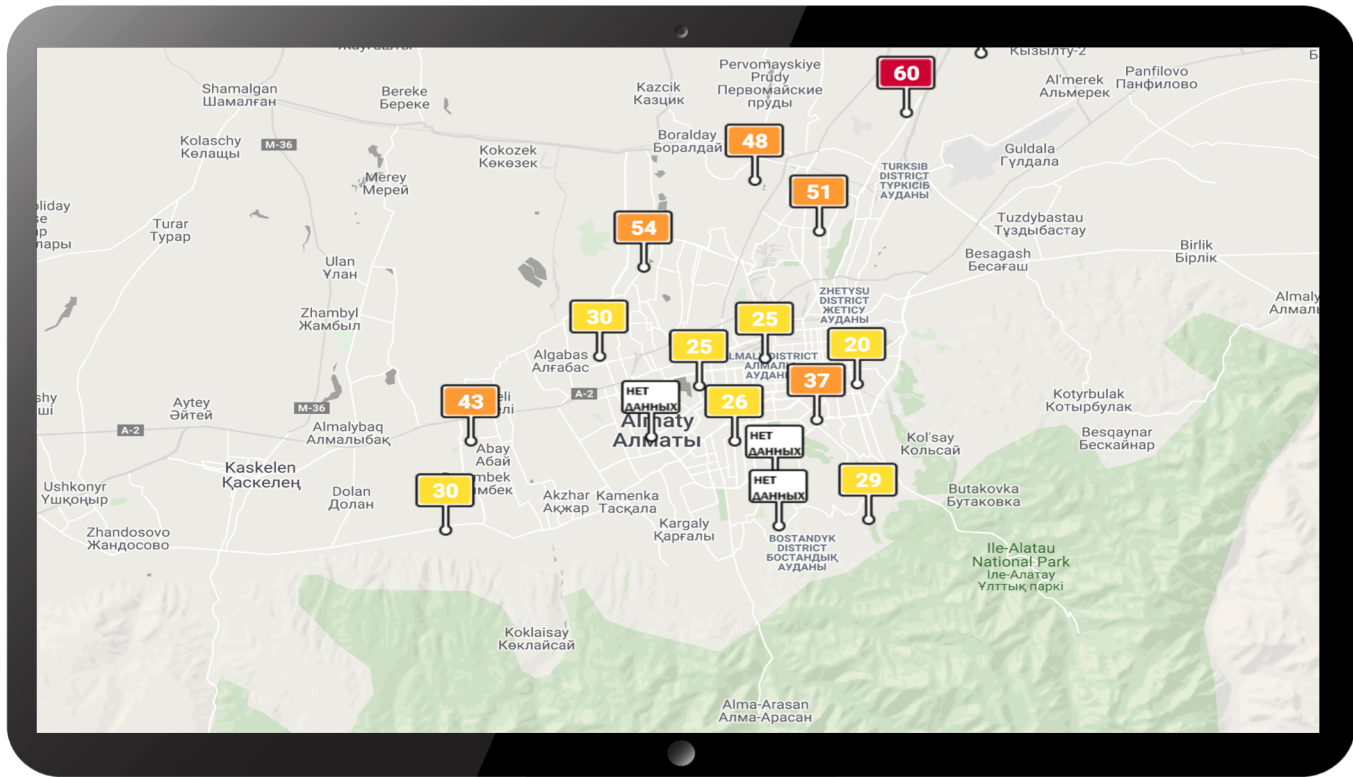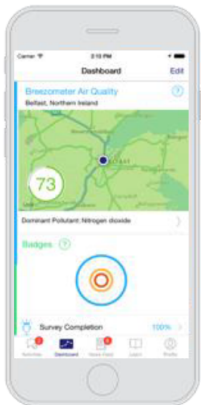
# Smart Lighting
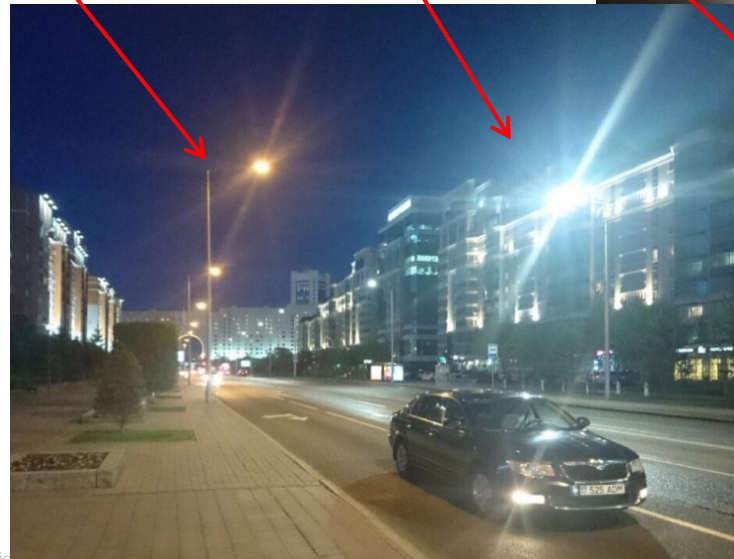
## Project concept:
smart lighting as a base for smart city

**200** controllable luminaries Philips

**4** Digital Control cabinets

**4** Cisco routers with LoRa modems

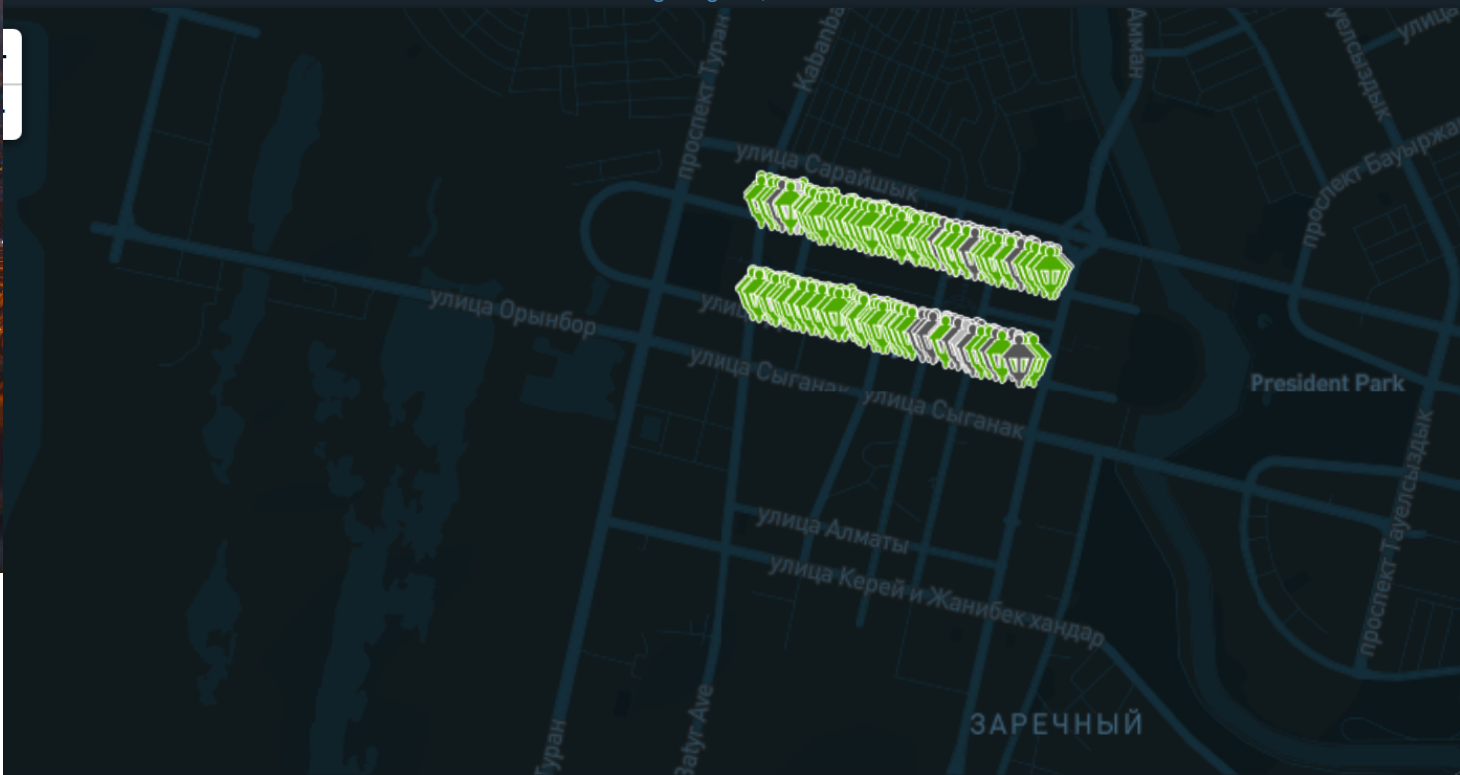**204** Nodes in Cisco CKC

OLD

NEW

Dashboard | Map View | Alerts | Policies | Events | Reports

## Lighting Map

### Lighting

**Lighting Status**

## 94%
**CONNECTED**

Lights On
## 131

Total Lights
## 187

Light Groups
## 0

### Lighting

*176 of 187 lights active*

# 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

# Cisco Kinetic for Cities Partner Ecosystem

**Cisco DevNet provides access to API's, sandbox and documentation**

| Parking | Lighting | Urban Mobility<br>Traffic, Transit, Crowd | Environment | Safety and Security | Waste Management |
|---|---|---|---|---|---|

CIMCON Lighting, Inc. — Controls Simplified

TVILIGHT — EMPOWERING INTELLIGENCE

CivicSmart

FLASHNET

sensity

WORLD SENSING

BreezoMeter

n3n — VISUALIZE 1st

leapcraft™

KiwiSecurity — AUTOMATING VIDEO SURVEILLANCE

iOmniscient — High IQ Analytics

PARADOX ENGINEERING — MinebeaMitsumi Group

More...

| Certified Urban Services | Certified Applications | Certified Sensors |
|---|---|---|

CISCO

Over **70** Partners integrated

CISCO Compatible

# Creating Shared Value

**CITY AGENCIES**

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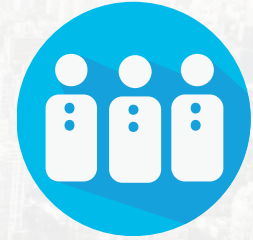
**CITIZENS**

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

# Resources:

- Website: cs.co/cities
- Blogs: blogs.cisco.com/government
- Digital Transformation Map: cisco.com/go/digitalmap
- Cities Digital Value at Stake: cs.co/digitalcity
- Follow the conversation: @CiscoGovt
- YouTube Playlist: https://www.youtube.com/playlist?list=PLEE1CB50148EBA975
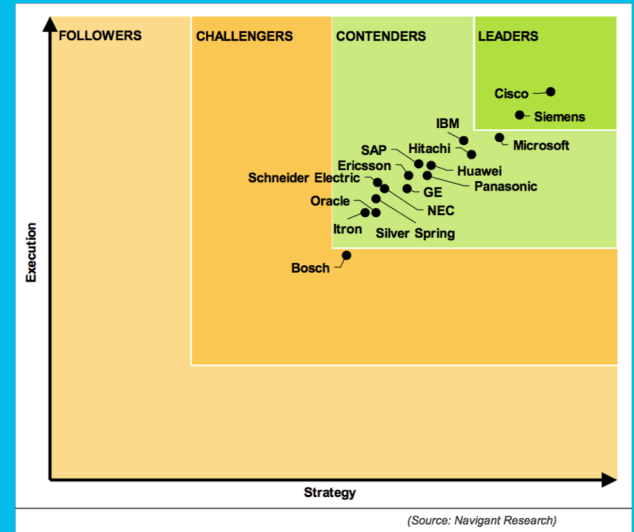
# Cisco Kinetic for Cities Market Leadership



## Success around the world... with more each day!

## Cisco Kinetic for Cities
# Ranks #1
## among Smart Cities Suppliers !



| FOLLOWERS | CHALLENGERS | CONTENDERS | LEADERS |
|---|---|---|---|

Cisco
IBM — Siemens
SAP Hitachi — Microsoft
Ericsson Huawei
Schneider Electric Panasonic
Oracle GE
Itron NEC
Silver Spring
Bosch

Execution

Strategy

*(Source: Navigant Research)*

https://www.cisco.com/c/m/en_us/solutions/industries/smart-connected-communities/digital-transformation-map.html

# 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, $CO_2$, $SO_2$, 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 green = 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

*Features listed in green = New with 4.0*

Cisco Kinetic for Cities Video

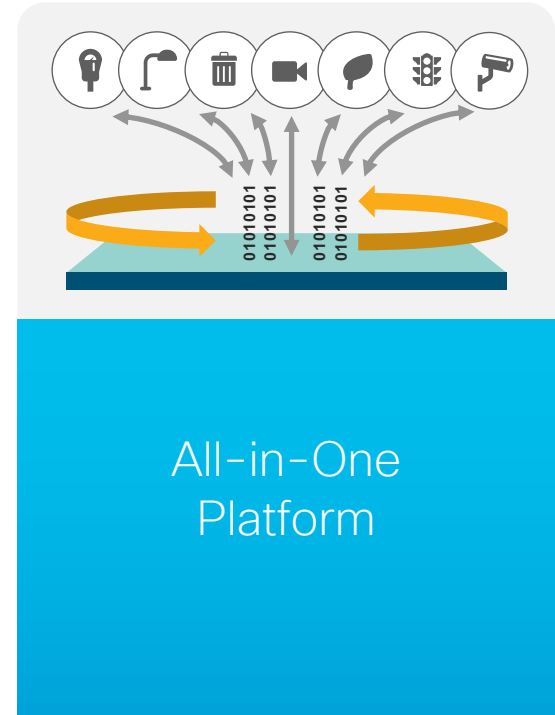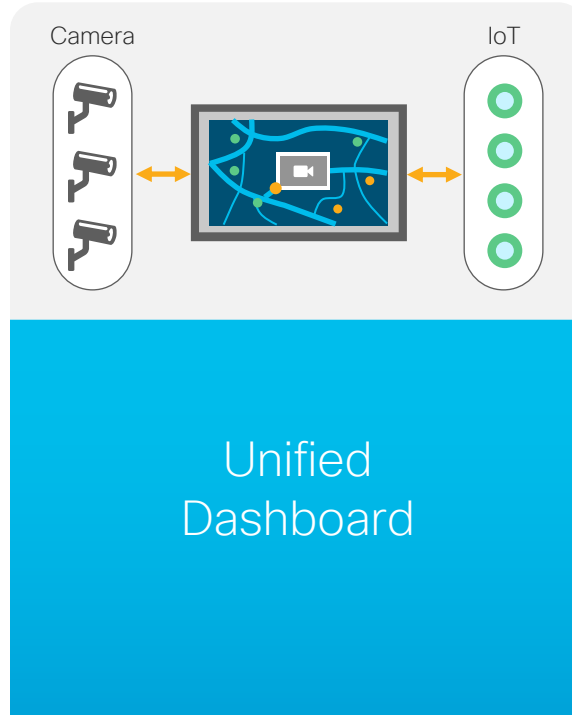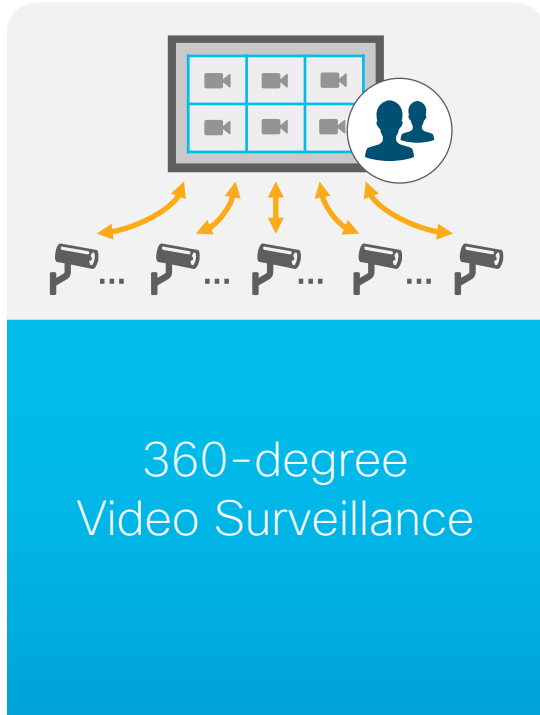# Smart City/Operator – Challenges



Few of the challenges are listed below:

Receiving important camera streams from multiple VSM's to a single operator console

Ability to search and locate for specific camera in an array of camera's deployed across city.
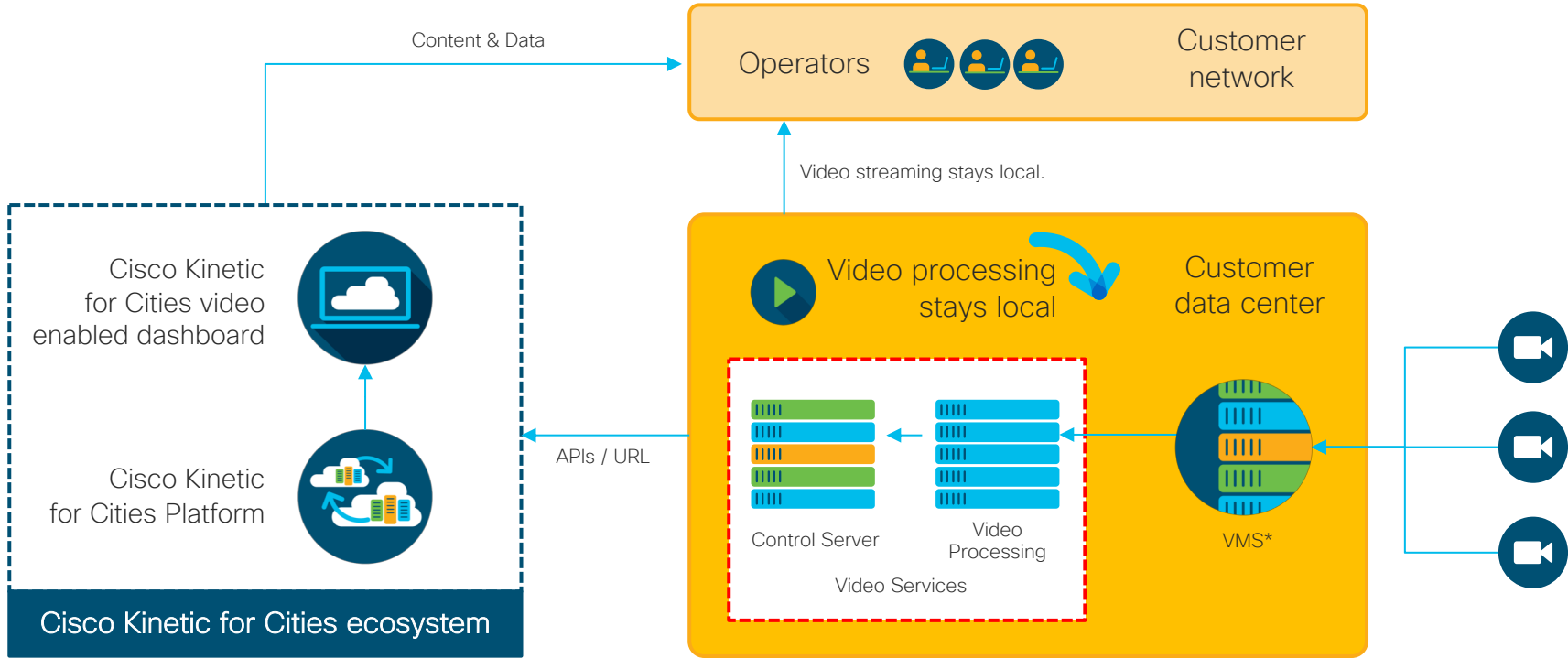
Correlating IOT data with Video cameras for informed decisions.
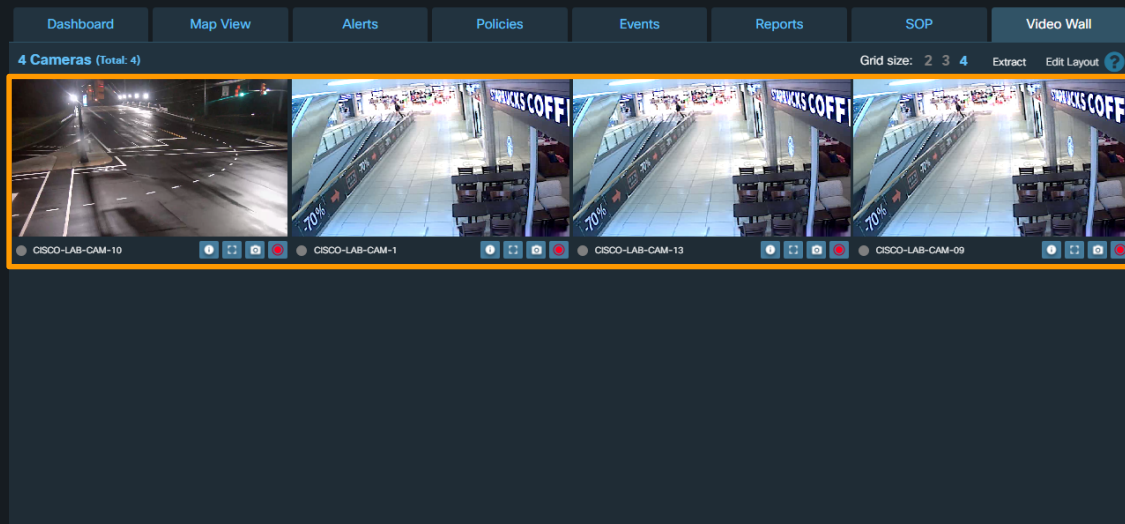
# Cisco's Solution



## 360-degree Video Surveillance

## Unified Dashboard

## All-in-One Platform

# Cisco Kinetic for Cities Video Solution High level Architecture



Content & Data

Operators | Customer network

Video streaming stays local.

Cisco Kinetic for Cities video enabled dashboard

Cisco Kinetic for Cities Platform

Cisco Kinetic for Cities ecosystem

APIs / URL

Video processing stays local | Customer data center

Control Server

Video Processing

Video Services

VMS*

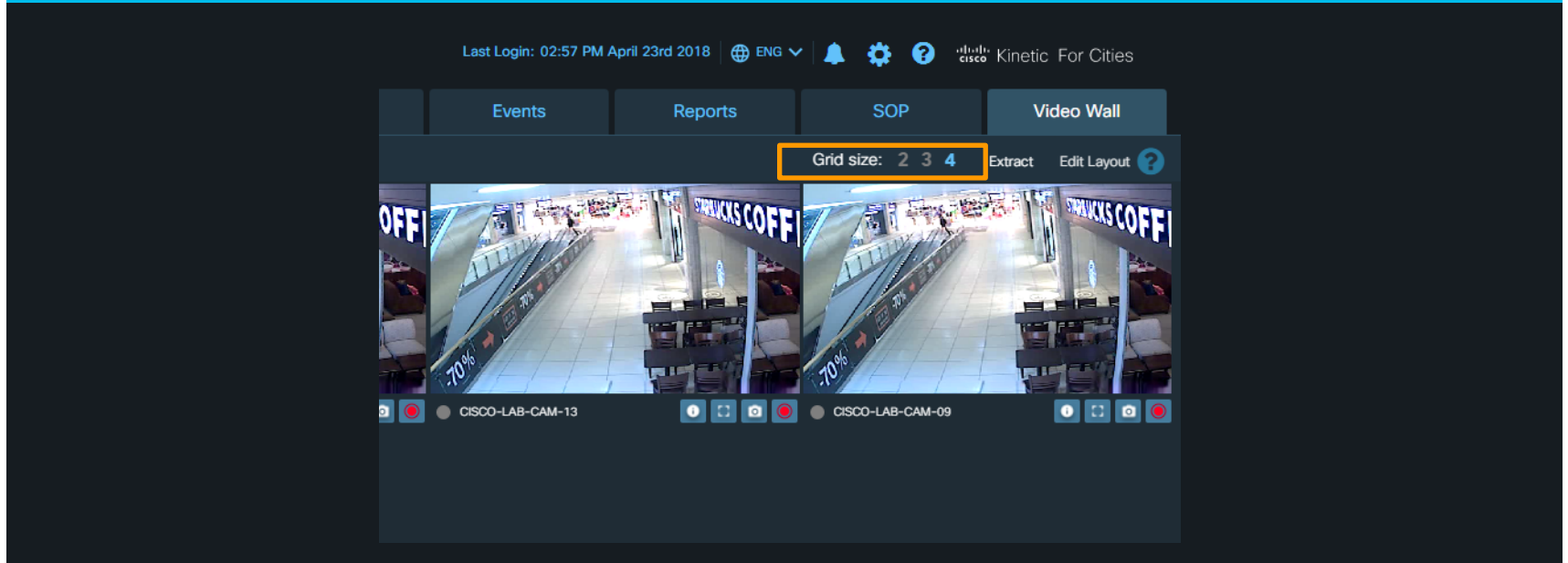* There could be multiple VSM from different vendors or could be Cisco VSOM

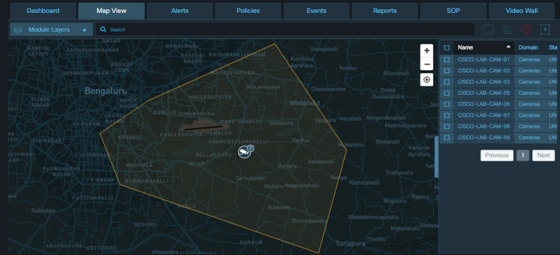# Video wall features



Video wall – Grid View

# Video wall features



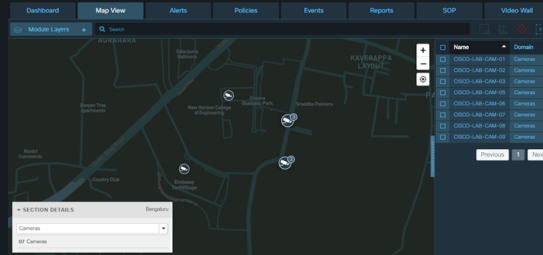Grid size selection based on operators comfort for viewing camera

# Video wall features

Geo tagged camera in Map View for easy correlation between the view and its location



Cluster view

Geo tagged Camera icons

Live video in Map View

# Video wall features

Camera controls for easy management
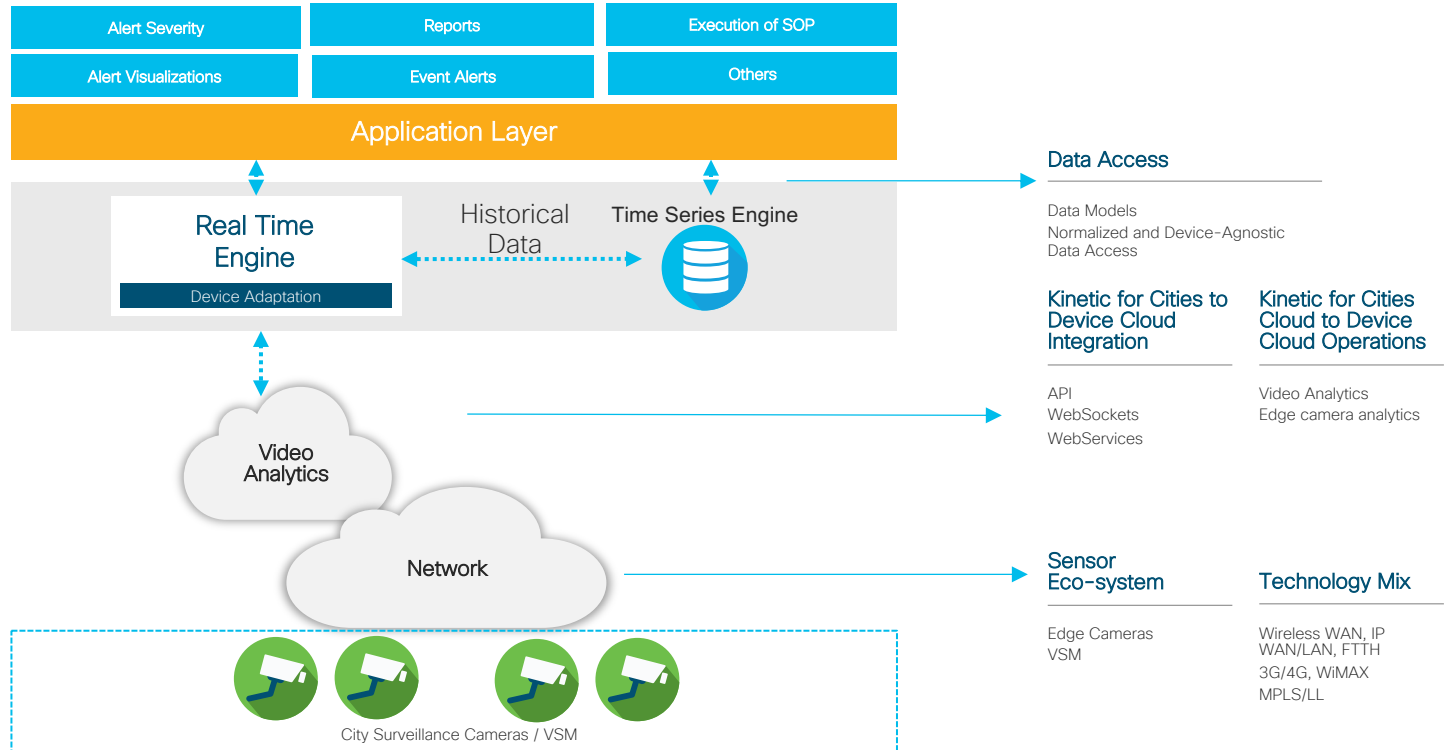Ad-hoc recording for capturing suspicious activity or events

# Cisco Kinetic for Cities Safety and Security Solution

# Cisco Kinetic for Cities Safety and Security Solution Architecture

| Alert Severity | Reports | Execution of SOP |
|---|---|---|
| Alert Visualizations | Event Alerts | Others |

**Application Layer**

**Real Time Engine**

Device Adaptation

Historical Data

**Time Series Engine**

Video Analytics

Network

City Surveillance Cameras / VSM

### Data Access

Data Models
Normalized and Device-Agnostic
Data Access

### Kinetic for Cities to Device Cloud Integration

API
WebSockets
WebServices

### Kinetic for Cities Cloud to Device Cloud Operations

Video Analytics
Edge camera analytics

### Sensor Eco-system

Edge Cameras
VSM

### Technology Mix

Wireless WAN, IP
WAN/LAN, FTTH
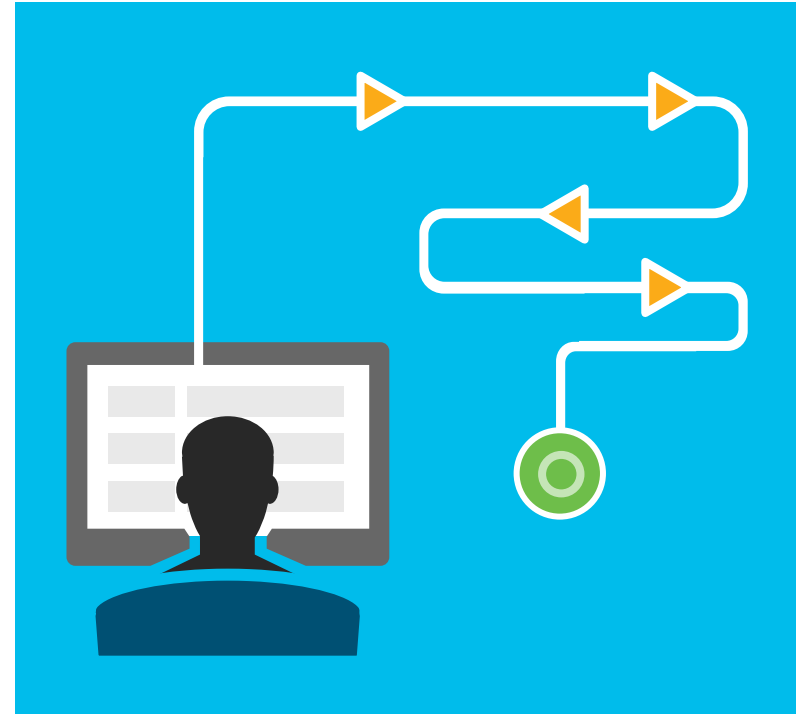3G/4G, WiMAX
MPLS/LL

# Standard Operating Procedure (SOP)

# Standard Operating Procedure (SOP)

- Standard Operating Procedure or SOP helps to lay down guidelines and procedures for preventing and dealing with different situations that arise in Cities.

- Cisco Kinetic for Cities Dashboard allows unlimited SOPs to be created and mapped to different types of incidents so that the mappings are persistent.

# Typical SOP Endpoints



Alert → Type / Severity / Branches → SOP → E-Mail, Automated SMS, Automated call

SOPs
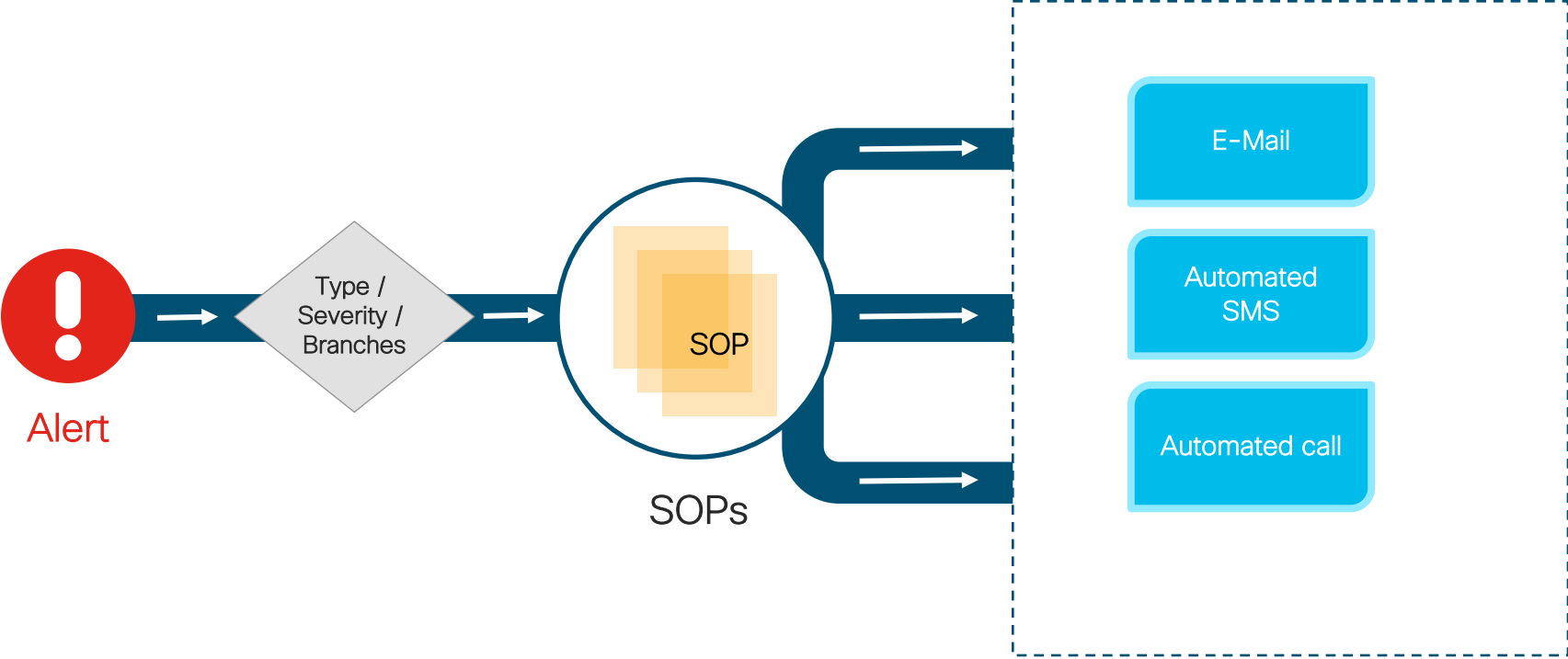
# Standard Operating Procedure – Take Action!

The SOP gives the capability to define the following activity types:

**Manual** *Activity* **( 1** An activity that is done manually by the owner and carry out sequential steps automatically e.g. Sending email alert, automated call to Departments

**If–Then–Else** *Activity* **( 2** A conditional activity that allows branching based on specific criteria. Either enter or select values for Then and Else. E.g. Based on Severity of Incidents, call different authorities, escalation paths when needed

**Notification** *Activity* **( 3** An activity that displays a notification window that contains an email template for the activity owner to complete, and then sends an email notification. E.g. Sending email alert when a threshold gets exceeded

\*Cisco Kinetic for Cities Solution supports SOP's for alerts in Safety and Security (SnS) and Environment Domains. There is also support for SOP's for couple of alerts each in Parking (No parking and Poorly Parked) and Traffic (Speeding and Wrong Way)

# SOP: Standard Guidelines and Procedure for Complex Routine Operations

# Situational Awareness + Take Control

**Alert**
- Real Time Notification
- Visible on Map View

**Validate**
- Recorded clipping
- Image snapshot

**Take Action**
- Dismiss
- Prioritize
- Execute SOP
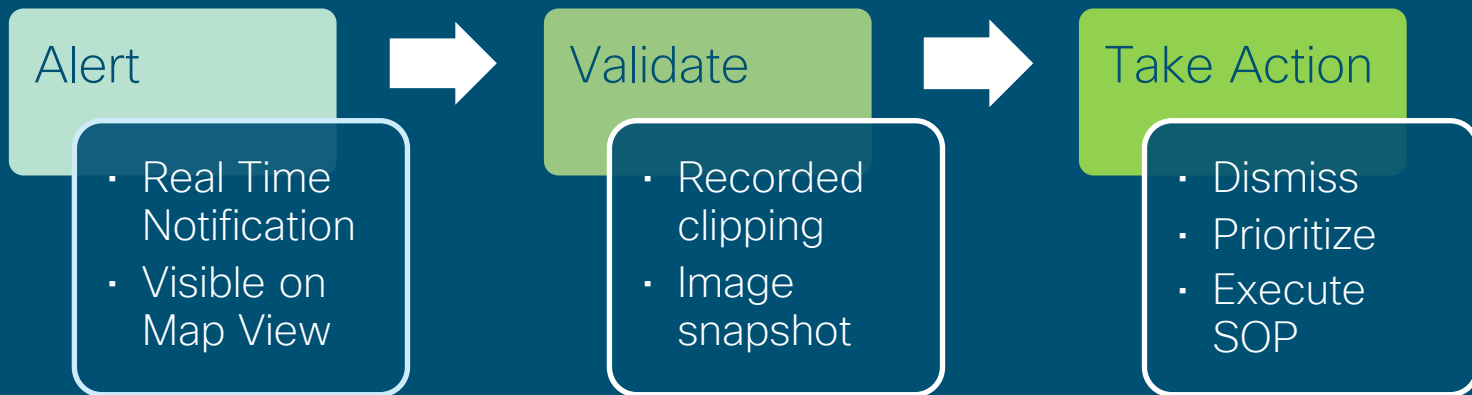
# Safety and Security Alerts
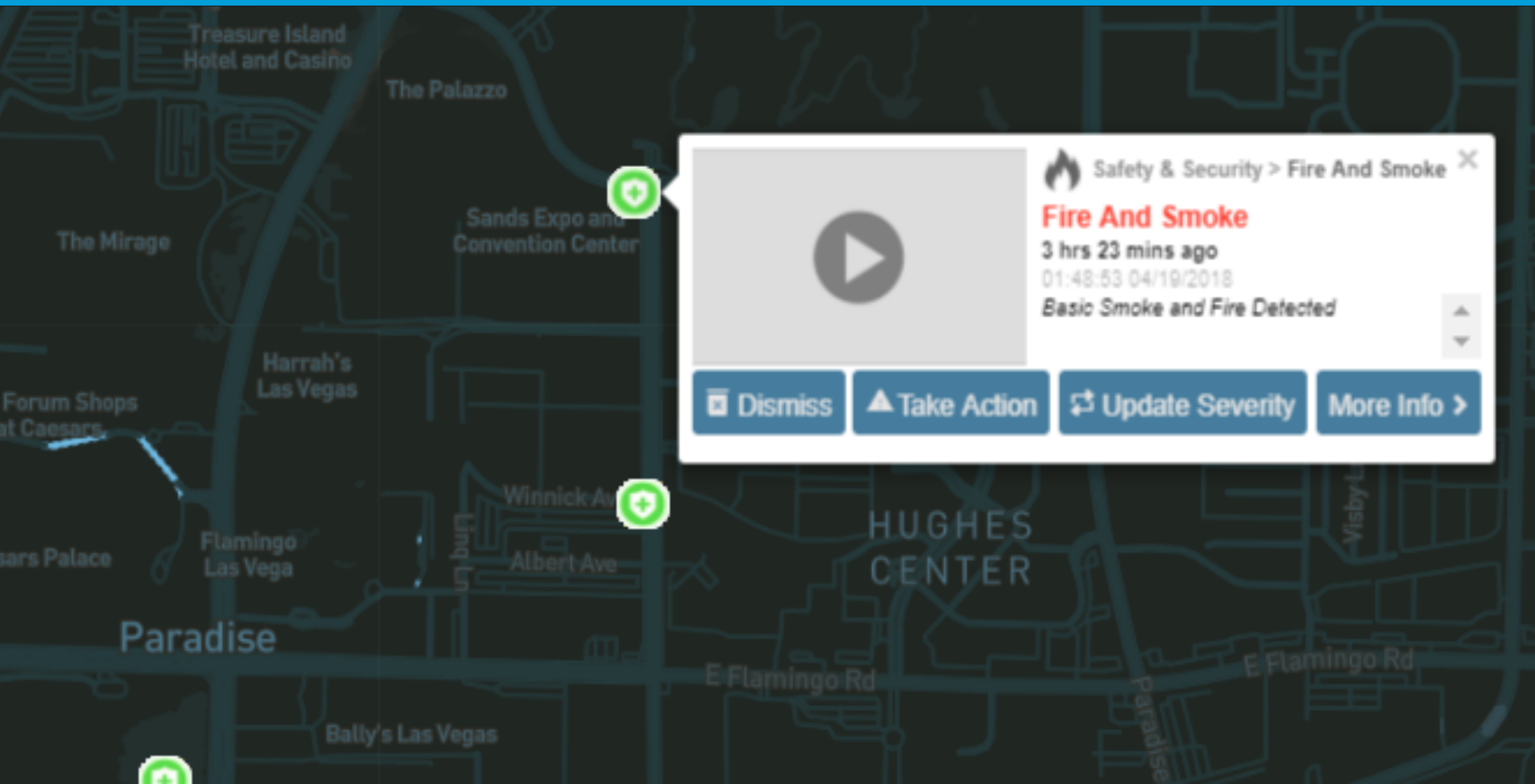


Safety & Security > Fire And Smoke

**Fire And Smoke**

**3 hrs 23 mins ago**
01:48:53 04/19/2018

*Basic Smoke and Fire Detected*

Dismiss | Take Action | Update Severity | More Info >

# Cisco Kinetic for Cities Waste Management Solution Architecture



| Route Optimization | Reports | Cross Vertical Alerts |
|---|---|---|
| Bin Visualizations | Event Alerts | Others |

**Application Layer**

**Real Time Engine**
Device Adaptation

Historical Data

**Time Series Engine**

Waste management

Fleet

Other Device Clouds (environment, etc.)

Network Transport

Connected Waste bins

Connected Garbage Trucks

**Device-Agnostic**

Device Provisioning
Device Control

Policy Management
Composite APIs

Alert/Notifications

**Data Access**

Data Models
Normalized and Device-Agnostic
Data Access

**Kinetic for Cities to Device Cloud Integration**

REST API
WebSockets
WebServices

**Kinetic for Cities Cloud to Device Cloud Operations**

Device Provisioning
Policy Management
Authorization and Access Control
Device Control
Data Collection
Alerts and Notifications

**Proprietary Device Operations**

Device Provisioning
Device Control
Data Collection
Alerts and Notifications

**Technology Mix**

CoAP, MQTT, LoRa,802.15.4 ZigBee, WiHART

# Cisco Kinetic for Cities Partner Ecosystem

| Parking | Lighting | Waste Management | Environment | Urban Mobility | Safety and Security |
|---|---|---|---|---|---|
| Smart Parking Ltd | Sensity | B H Technologies | PAQS (Airdata) | Sensity | Iomniscient |
| Sensity | Tvilight | Mobiquest | Auriga | World Sensing (Bitcarrier) | Kiwi |
| Civicsmart | Flashnet | Smartbin | Leapcraft | Kiwi | |
| Metro Infrasys | Cimcon | Sayme | Breezometer | Cisco CMX | |
| Urbiotica | Nipun | Wellness | SmartSense | Meraki CMX | |
| Cleverciti | Paradox | Big Belly | Clarity | Ecocounter | |
| Paradox | Unilight (ITEF) | Victor Stanley | Oizom | Trinity | |
| Kiyunsys | Icegateway | Samtech | Airosense | Iomniscient | |
| Mobilisis | Mayflower | Trinity | Ability | Vinotion | |
| World Sensing (FastPrk) | Infinium | Bioenable | Libelium | Zipcars | |
| Frog | Itron | Greensystech | Icegateway | | |
| TSK | | WasteControl | Nemec | | |
| PParke | | | Powermode | | |
| Parkdots | | | MeCompany | | |
| Parkres | | | AurAssure | | |
| Nexpa | | | | | |
| Swarco | | | | | |

Last Updated : December 2018

# Accelerate Adoption with Starter Solutions

## Lighting

**Value proposition**

Cities: Lower opex (energy reduction and fault detection)

Citizens: Improve safety

**Starter Solution**

## Parking

**Value proposition**

Cities: Improve space availability and generate revenue

Citizen: Readily find parking

**Starter Solution**

## Environment

**Value proposition**

Cities: Lower cost of monitoring, drive air quality compliance

Citizens: Visibility to local air quality data

**Starter Solution**

## Urban Mobility
### Traffic and Crowd

**Value proposition**

Allows traffic and crowd analysis for congestion monitoring and visibility

**Starter Solution**

## Waste Management

**Value proposition**

Cities: Improved efficiency in tracking generation and disposal of waste

Citizens: Cleaner, safer neighborhoods

**Starter Solution**

## Safety & Security

**Value proposition**

Reduce crime (deterrence)

Increase collaboration (common incident views across agencies)

**Starter Solution**

# Cisco Kinetic for Cities Starter Solutions

- Start fast, grow over time
- Pre-selected technology partners & fixed components
- 2 weeks after physical install to tangible business value
- Hardware/SW/Services, Cisco and 3rd party, in a single package