Internet of Things (IoT) Strategy Smart Cities & Service Improvements Committee Update
5th April 2018

Our Approach & Progress To-date
We've combined research and engagement with CSJ staff to get here

TODAY: SCSI Committee Update

Sept 2017 ———— **Jan 2018** ———— **Fall**

CURRENT STATE RESEARCH	PEER CITY RESEARCH	DESIGN INPUTS BY STAFF	SAN JOSE IOT DEEP DIVE DELIVERABLES
13x Innovation Cabinet interviews across 11 departments	**6x Comparator city interviews**	**Innovation Cabinet Workshops**	*Finalize IoT strategy and transformation roadmap*
San José Smart City vision	**12x Comparator city benchmarks**	**4x Architectures workshops**	*Return to SCSI for Final Approval*
City Manager enterprise priorities			
San José research on existing use cases and assets	**NYC IoT Principles**	**8x IoT Guiding Principles**	

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IoT = Internet of Things

IoT refers to:

Sensors receiving and sending data over the internet to talk to each other and do things

IoT in the San Jose context

Key
= Not started

= Piloted or deployed somewhere in City

Illustrative depiction

Smart streetlights that **automatically dim** and alert when out

Traffic light prioritization to aid **transit and public safety vehicles**

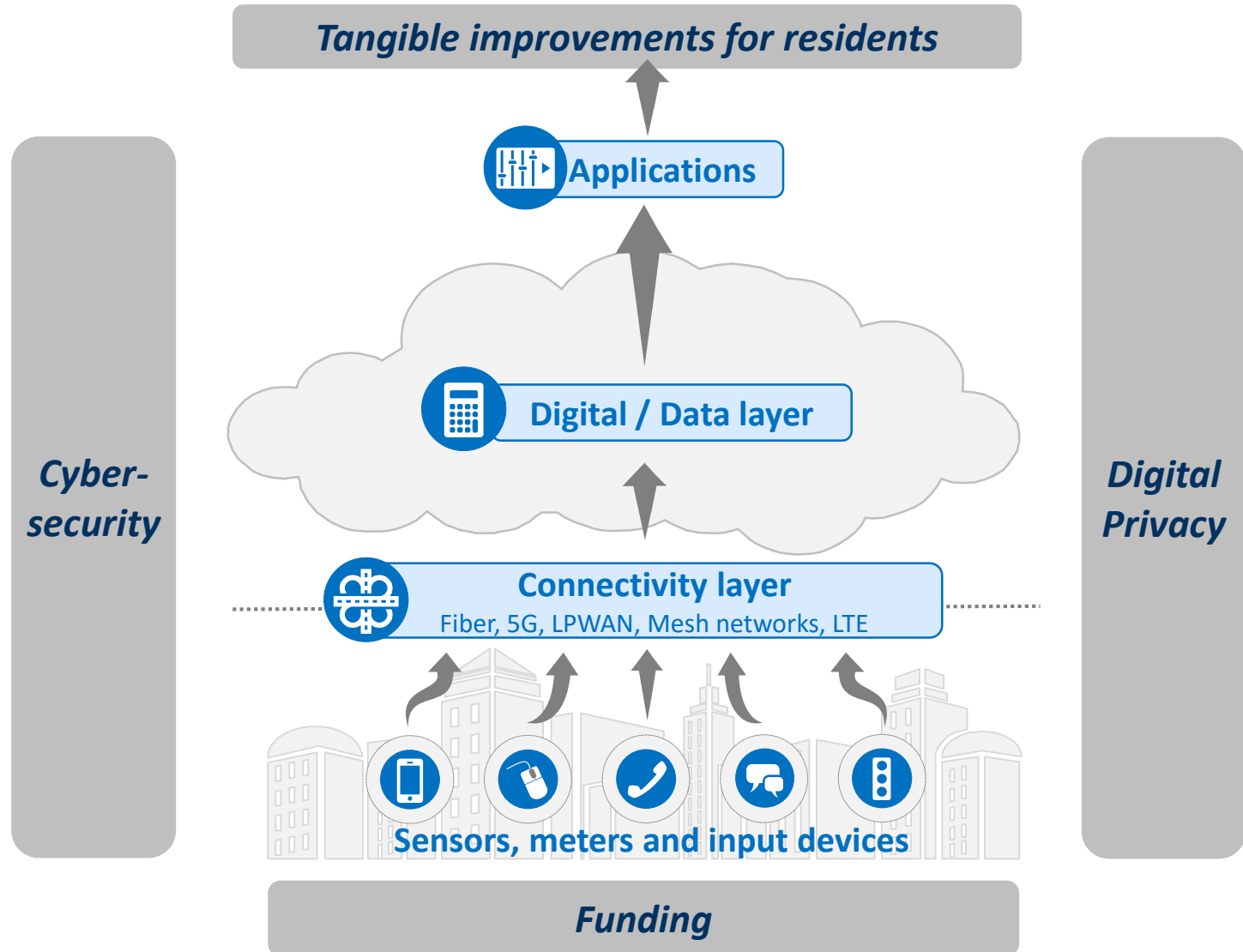Buildings that **reduce energy use** during peak load periods

Autonomous vehicles to **reduce traffic deaths**

Manhole covers that **alert during sewage overflows**

Water pipes that can **locate leaks** (SJWC)

San Jose has deployed IoT point solutions; the next step is maturing these deployments at scale

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We are already doing IoT, but we can improve

We are already doing IoT...

...but we could be doing it better.

IoT is immature everywhere....

...but there are pockets of success to look to.

And we need to act now or risk being relegated to a reactive stance

No city has mastered IoT at scale yet, but San José can learn from others to create its foundation, and scale

IoT applications
Case studies from other cities

Smart Waste Bins

Dun Laoghaire, Ireland

- 400 smart waste bins for €2.3m

- Use Wi-Fi to notify the city when they are 85% full

- Reduced Dun Laoghaire number of bins collected by 85% and fleet operating costs by 75%.

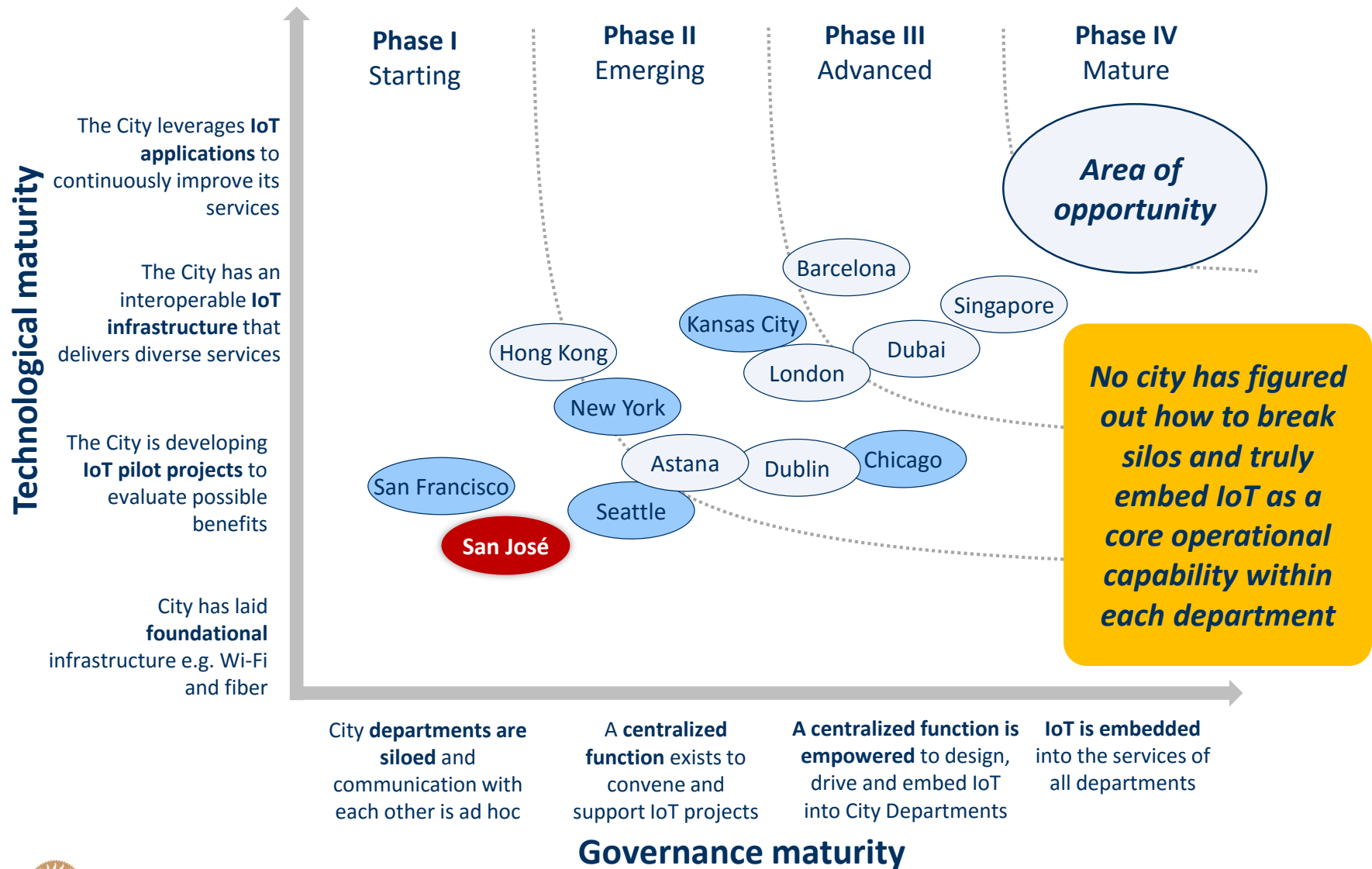### Predictive Road Maintenance

Kansas City, MO

- KCMO overlaid multiple datasets (geo-local, transport, weather, traffic etc.) and introduced an algorithm to predict road maintenance issues such as potholes.

- Reduced highway maintenance by 50%.

How does San José compare with other cities?

Different cities are at different stages of maturation

Technological maturity

Phase I — Starting
Phase II — Emerging
Phase III — Advanced
Phase IV — Mature

The City leverages **IoT applications** to continuously improve its services

The City has an interoperable **IoT infrastructure** that delivers diverse services

The City is developing **IoT pilot projects** to evaluate possible benefits

City has laid **foundational** infrastructure e.g. Wi-Fi and fiber

Area of opportunity

No city has figured out how to break silos and truly embed IoT as a core operational capability within each department

Cities plotted: Barcelona, Singapore, Kansas City, Dubai, London, Hong Kong, New York, Astana, Dublin, Chicago, San Francisco, Seattle, **San José**

Governance maturity

City **departments are siloed** and communication with each other is ad hoc

A **centralized function** exists to convene and support IoT projects

A **centralized function is empowered** to design, drive and embed IoT into City Departments

IoT is embedded into the services of all departments

Setting San José's IoT Guiding Principles

These are designed to capture our imagination and drive ambition

4 BENEFIT AREA	8 IoT GUIDING PRINCIPLES TO REALIZE THOSE BENEFITS
SAFETY	**1** Ensure people's safety
	2 Safeguard people's digital privacy
EFFICIENCY	**3** Evolve a platform-centric approach
	4 Leverage data and analytics
EFFECTIVENESS	**5** Develop people-centric solutions
	6 Use cases with systemic benefits
INNOVATION	**7** Cultivate a partner ecosystem
	8 Become a learning city

This positive framing will ensure that benefits are our north star as we design our IoT Strategy

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IoT delivers benefits to San José residents
And helps the city deliver on its promises

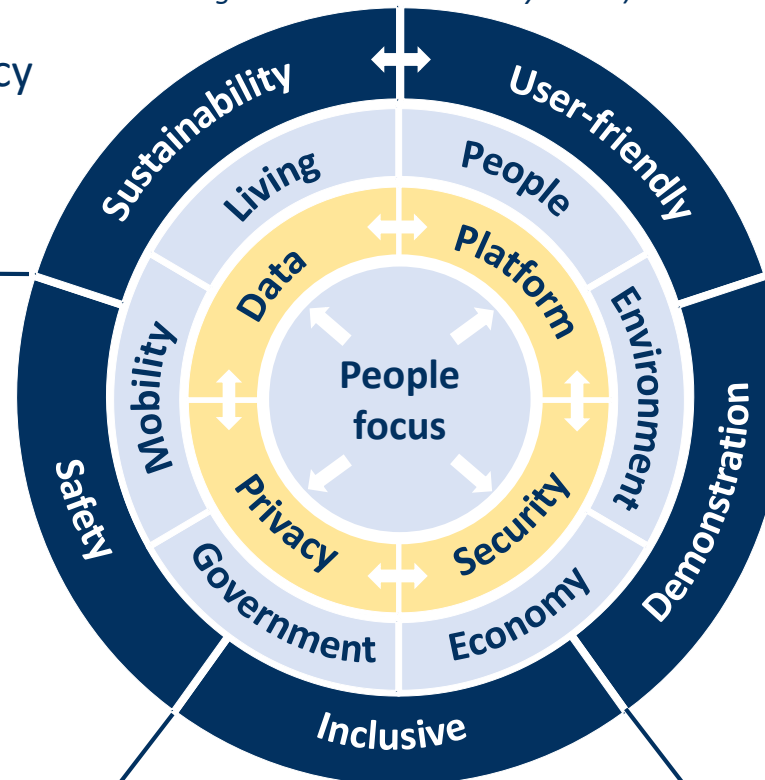**IoT and Smart City benefits**
(team interpretation, based on Boyd Cohen model, integrated with SJ Smart City Vision)

Unlock energy efficiency and scale renewable electrification

Delight residents and businesses with digital services and information

Prevent hazards and improve emergency response times

Deliver brand promise as Capital of Silicon Valley

Expand services in digitally excluded communities

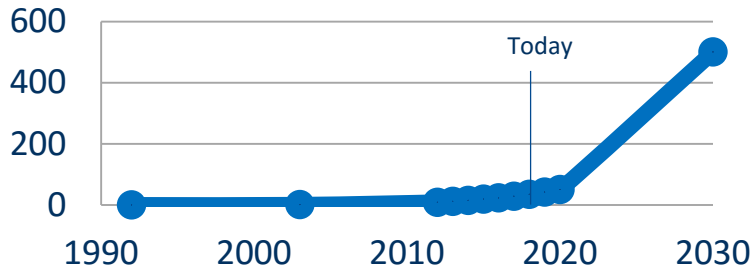**IoT is a critical enabler of San José's Smart City Vision**

The time for San José to act is now

Proliferation of connected devices and other forces

Technology is at a tipping point

Global connected device growth (billions)

Data sources: Cisco, IHS Markit Ltd., Ericsson

Realize cost savings while improving our services

- Avoid waste and duplication
- Predict/pre-empt issues
- Efficiently allocate resources

Heightened community interest in IoT topics

- Digital privacy
- Avoid high-profile, negative experiences of working with IoT solutions

Our brand promise as the Capital of Silicon Valley

- Live our Smart City Vision
- Practicing our culture of constructive experimentation
- Attract talent and investment

This Strategy will help City of San José prepare for a new digitally connected and data-driven world

We are not yet ready to handle lots of IoT

CHALLENGE

DATA fragmented across multiple systems

Lack formal approach to **DIGITAL PRIVACY**

New **CYBERSECURITY** risks

INTEGRATING DATA is complex

SOFTWARE MATURITY varies

Current deployments are **AD HOC**

DESIGN CONSIDERATIONS

Expand **DATA STRATEGY**

Establish **UNITED FRONT** on digital privacy
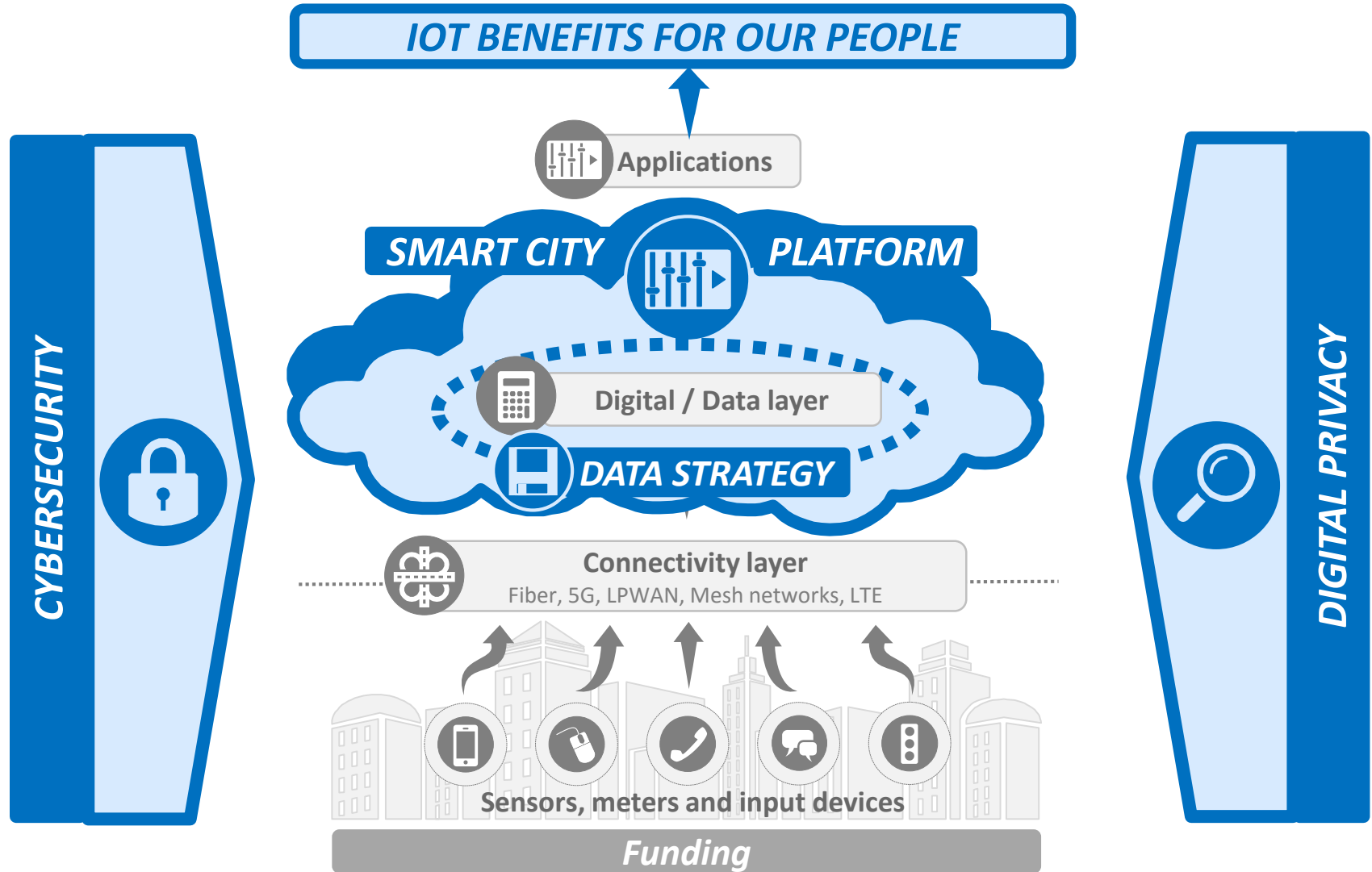
Introduce **BASIC SAFEGUARDS**

Look for **PLATFORM PARTNERS**

EXPERIMENT WITH USE CASES

BUILD ON EXISTING COLLABORATIONS

Incorporating these considerations will set us up for IoT success

We need some foundational building blocks to prepare

IOT BENEFITS FOR OUR PEOPLE

Applications

SMART CITY **PLATFORM**

Digital / Data layer

DATA STRATEGY

Connectivity layer
Fiber, 5G, LPWAN, Mesh networks, LTE

CYBERSECURITY

DIGITAL PRIVACY

Sensors, meters and input devices

Funding

These four building blocks need to be in place for IoT approach to succeed

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City of San José IoT Strategy
People-centric & Benefits-driven IoT

OPTIMIZE AROUND IoT BENEFITS

- SAFETY
- EFFICIENCY
- EFFECTIVENESS
- INNOVATION

3 PILOT AND SCALE

DEPLOY IOT ACROSS PRIORITY USE CASE DOMAINS

| PUBLIC SAFETY | MOBILITY | FACILITIES MANAGEMENT | ENVIRONMENT |

2 ENGAGE ALL STAKEHOLDERS

COLLABORATIVE AND DATA-DRIVEN CULTURE

PUBLIC AGENCIES ✕ GLOBAL PARTNERS ✕ LOCAL START-UPS ✕ COMMUNITY

CITY OF SAN JOSE STAFF

1 GET THE BASICS RIGHT

- CYBERSECURITY
- DIGITAL PRIVACY
- SMART CITY PLATFORM
- DATA STRATEGY

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City of San José IoT Strategy

Example use cases demonstrate the Strategy in action

OPTIMIZE AROUND IoT BENEFITS

Safer streets

Shorter commutes

More money for other needs

Improved community & partner collaboration

3

PILOT AND SCALE

DEPLOY IOT ACROSS PRIORITY USE CASE DOMAINS

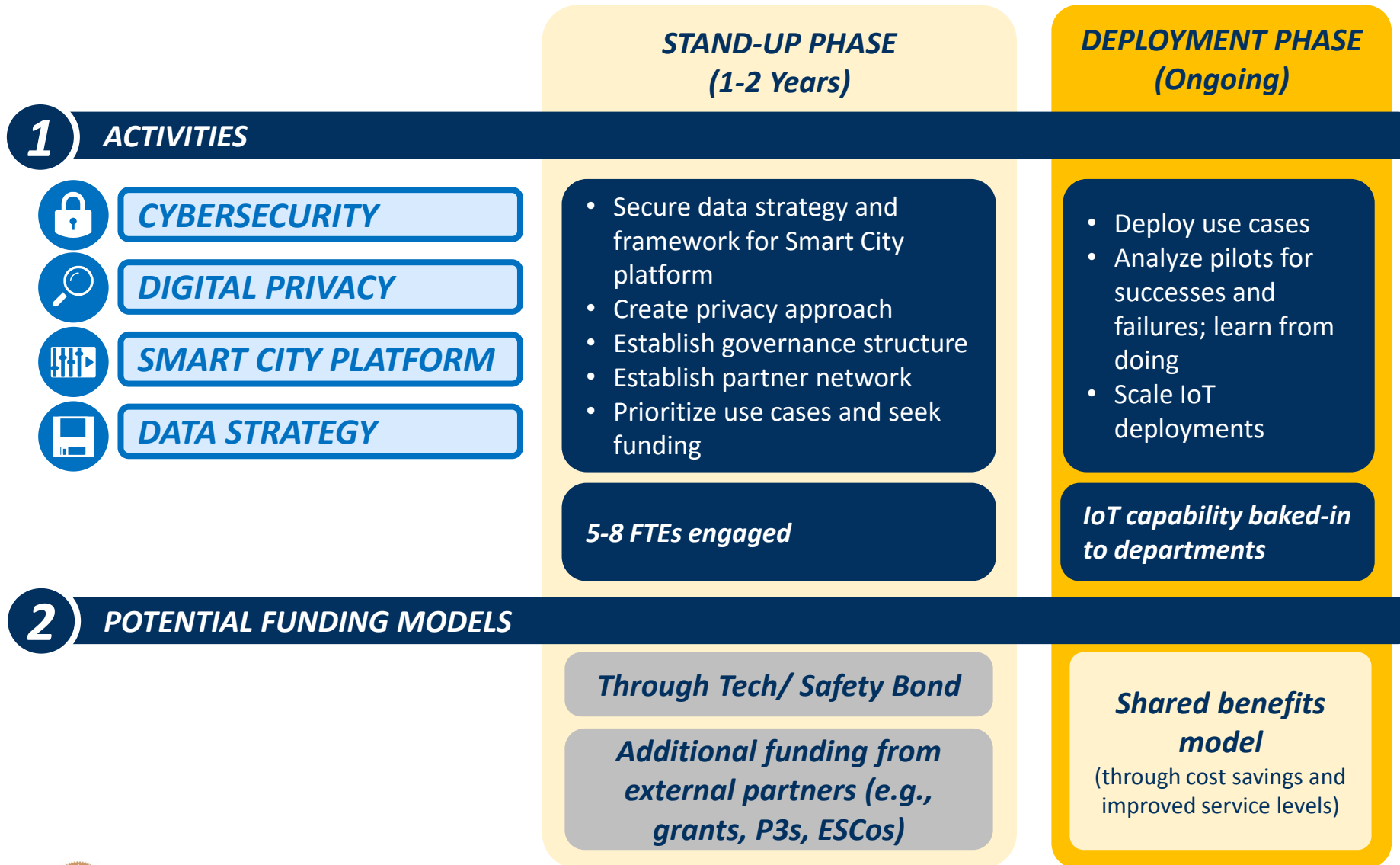|	PUBLIC SAFETY	MOBILITY	FACILITIES MANAGEMENT	ENVIRONMENT
Expected outcomes	Incident prevention	Reduced congestion	Route optimization	Higher recycling volumes
Illustrative use case	LED streetlights	Traffic counters	Asset inventory monitoring	Smart waste bins

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Sustained Focus on Building IoT Capabilities

5-8 FTEs are engaged to build our foundational capabilities

	STAND-UP PHASE (1-2 Years)	**DEPLOYMENT PHASE (Ongoing)**

1 ACTIVITIES

- CYBERSECURITY
- DIGITAL PRIVACY
- SMART CITY PLATFORM
- DATA STRATEGY

STAND-UP PHASE
- Secure data strategy and framework for Smart City platform
- Create privacy approach
- Establish governance structure
- Establish partner network
- Prioritize use cases and seek funding

5-8 FTEs engaged

DEPLOYMENT PHASE
- Deploy use cases
- Analyze pilots for successes and failures; learn from doing
- Scale IoT deployments

IoT capability baked-in to departments

2 POTENTIAL FUNDING MODELS

Through Tech/ Safety Bond

Additional funding from external partners (e.g., grants, P3s, ESCos)

Shared benefits model
(through cost savings and improved service levels)

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City of San José IoT Strategy
Discussion

OPTIMIZE AROUND IoT BENEFITS

- SAFETY
- EFFICIENCY
- EFFECTIVENESS
- INNOVATION

3 — PILOT AND SCALE

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PUBLIC SAFETY	MOBILITY	FACILITIES MANAGEMENT	ENVIRONMENT

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CITY OF SAN JOSE STAFF

1 — GET THE BASICS RIGHT

- 🔒 CYBERSECURITY
- 🔍 DIGITAL PRIVACY
- 🎚 SMART CITY PLATFORM
- 💾 DATA STRATEGY

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