



Essentials of the Smart Columbus Operating System



SPEAKERS



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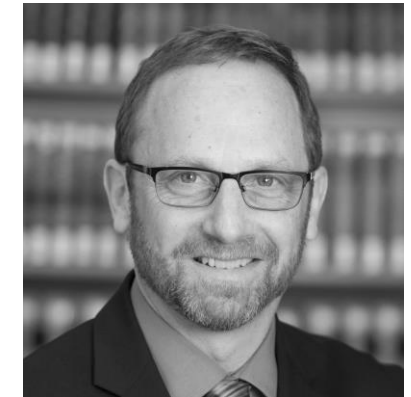
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TODAY'S AGENDA

01 | PURPOSE OF THIS WEBINAR

- Share concept development activities from Smart Columbus with stakeholders

02 | WEBINAR CONTENT

- Smart City Challenge Overview
- Smart Columbus Program Overview
- Smart Columbus Operating System | Product Vision and The Approach
- Smart Columbus Operating System | Architecture & Design, Development Approach
- Data Privacy
- Data Management
- Lessons Learned – So Far
- How to Stay Connected

03 | WEBINAR PROTOCOL

- All participant lines have been muted during the webinar in order to reduce background noise
- Questions are welcome via chatbox during the Q&A Section
- The webinar recording and presentation materials will be posted on the Smart Columbus website

\$40 MILLION

78 APPLIED • COLUMBUS WON



SMART CITY
CHALLENGE

THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR



U.S. Department of Transportation



SMART COLUMBUS OVERVIEW



COLUMBUS



SMART



VISION

To empower our residents to live their best lives through responsive, innovative and safe mobility solutions.



MISSION

To demonstrate how an intelligent transportation system and equitable access to transportation can have positive impacts on every day challenges faced by cities.

OUTCOMES



SAFETY



MOBILITY



OPPORTUNITY



ENVIRONMENT



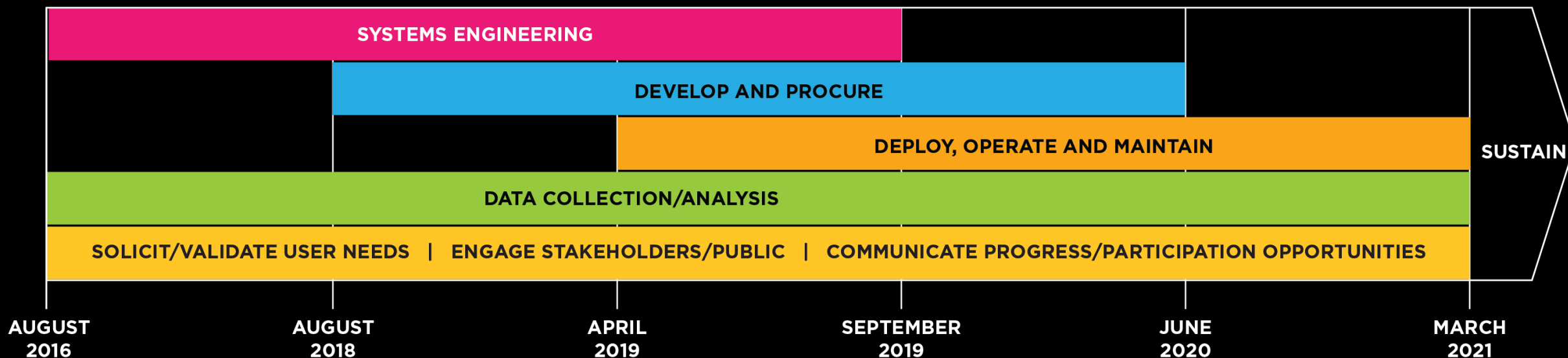
**AGENCY
EFFICIENCY**



**CUSTOMER
SATISFACTION**

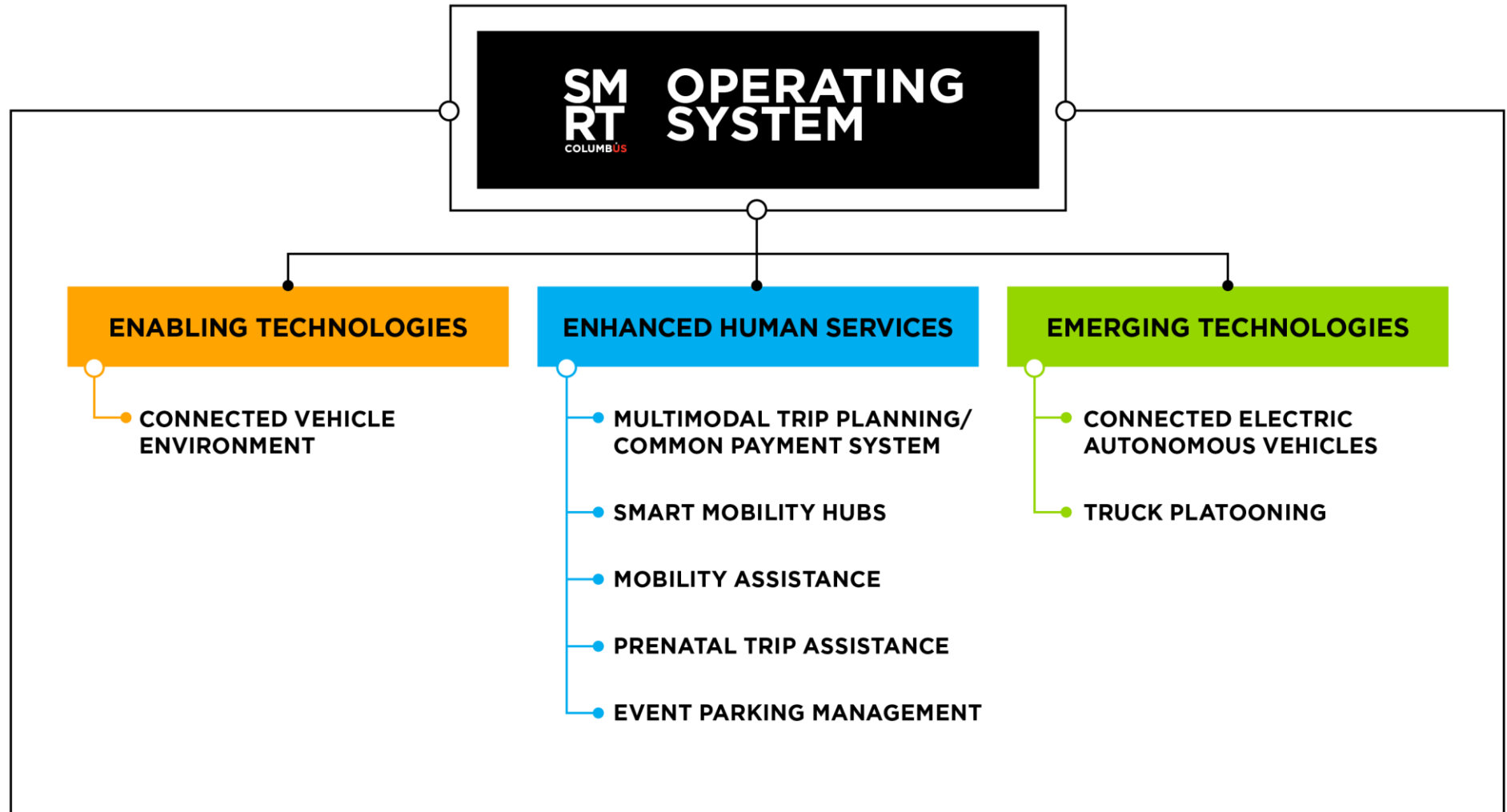
PROJECT PHASES AND TIMELINE

WHERE WE ARE GOING





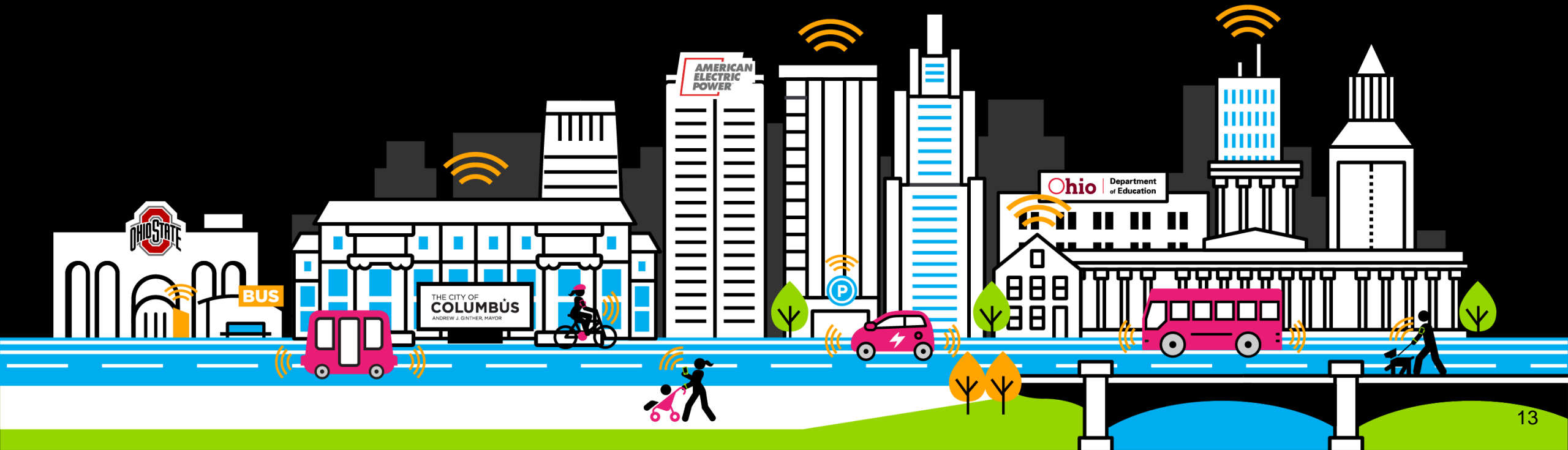
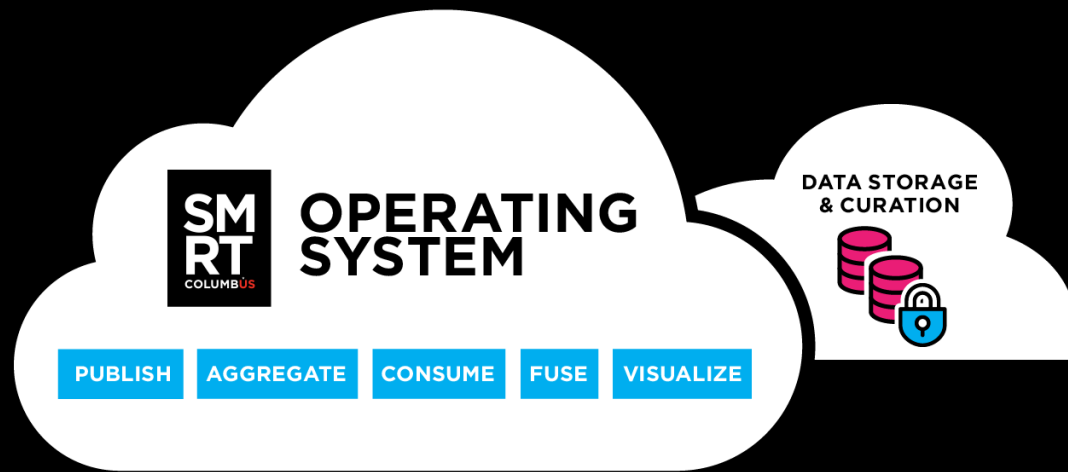
USDOT PORTFOLIO





Essentials of the
Smart Columbus
Operating System

THE PRODUCT VISION IT TAKES A VILLAGE



OPERATING SYSTEM BIG PICTURE

Data Inputs



Workers



Citizens



Public & Private
Systems

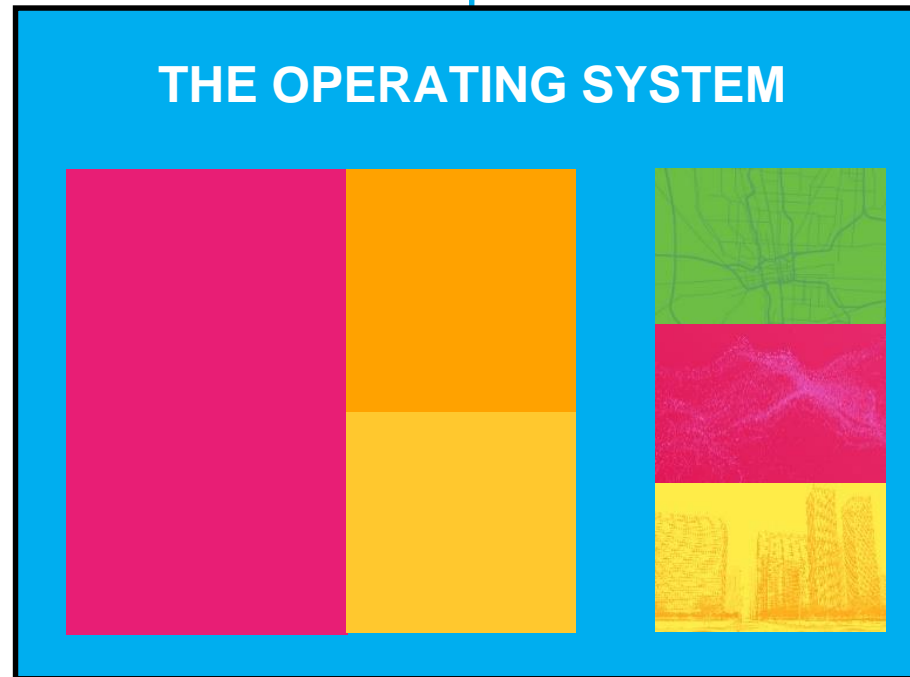


Devices & Things

Data Capture & Analysis



Data Scientist & Researchers



Application hosting and connectors
to other systems

Data Consumption



Public



Entrepreneur



Universities



Commercial
Partners



City



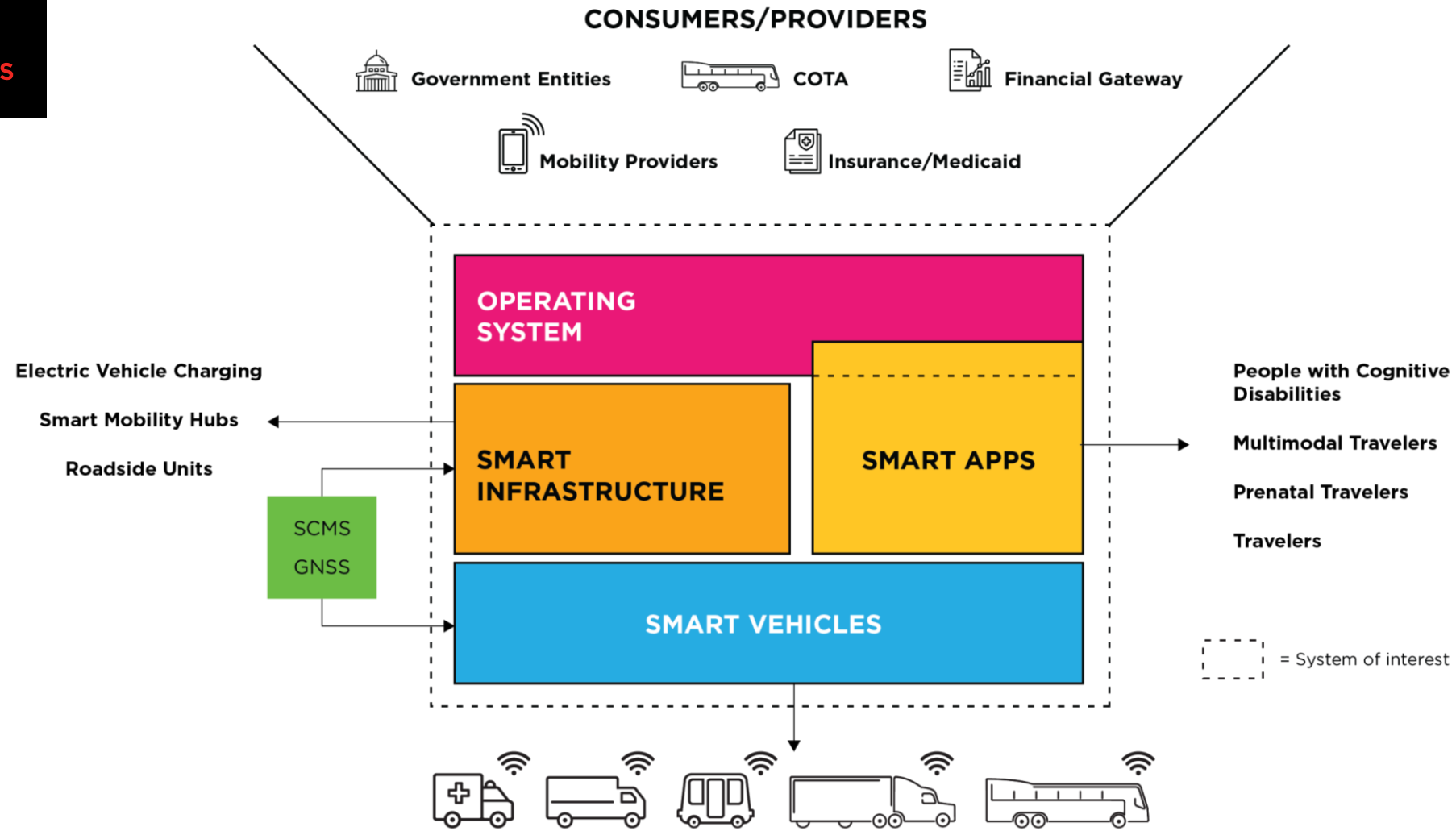
USDOT



Independent
Evaluators



A SYSTEM OF SYSTEMS



OUR APPROACH TO ESTABLISHING THE OPERATING SYSTEM

- We created a village comprised of volunteers from private, public, entrepreneurial and academic sectors.
 - Advisory Committee
 - Leadership & Executive Committees
 - Hackathons & Private Sector Engagement
 - ODOT
- Procurement of Talent



TECHNICAL WORKING GROUP (TWG)

Data

- Identify use cases for data to solve community challenges & continue to make the city smarter

Technical

- Architecture & Design Recommendations
- Best Practices
- Tech Strategies
- Licensing / IP

Policy

- Data Management
- Data Privacy
- Open Data & Data Sharing
- Liabilities

Sustainability

- Sustainability models
- Offsetting cost



Essentials of the
Smart Columbus
Operating
System

ARCHITECTURE, DESIGN & DEVELOPMENT APPROACH



Value Stories ensure the team focuses work on providing the most value first.



THIN SLICING

At every phase, we want to align on the current picture with shared understanding of the next picture.

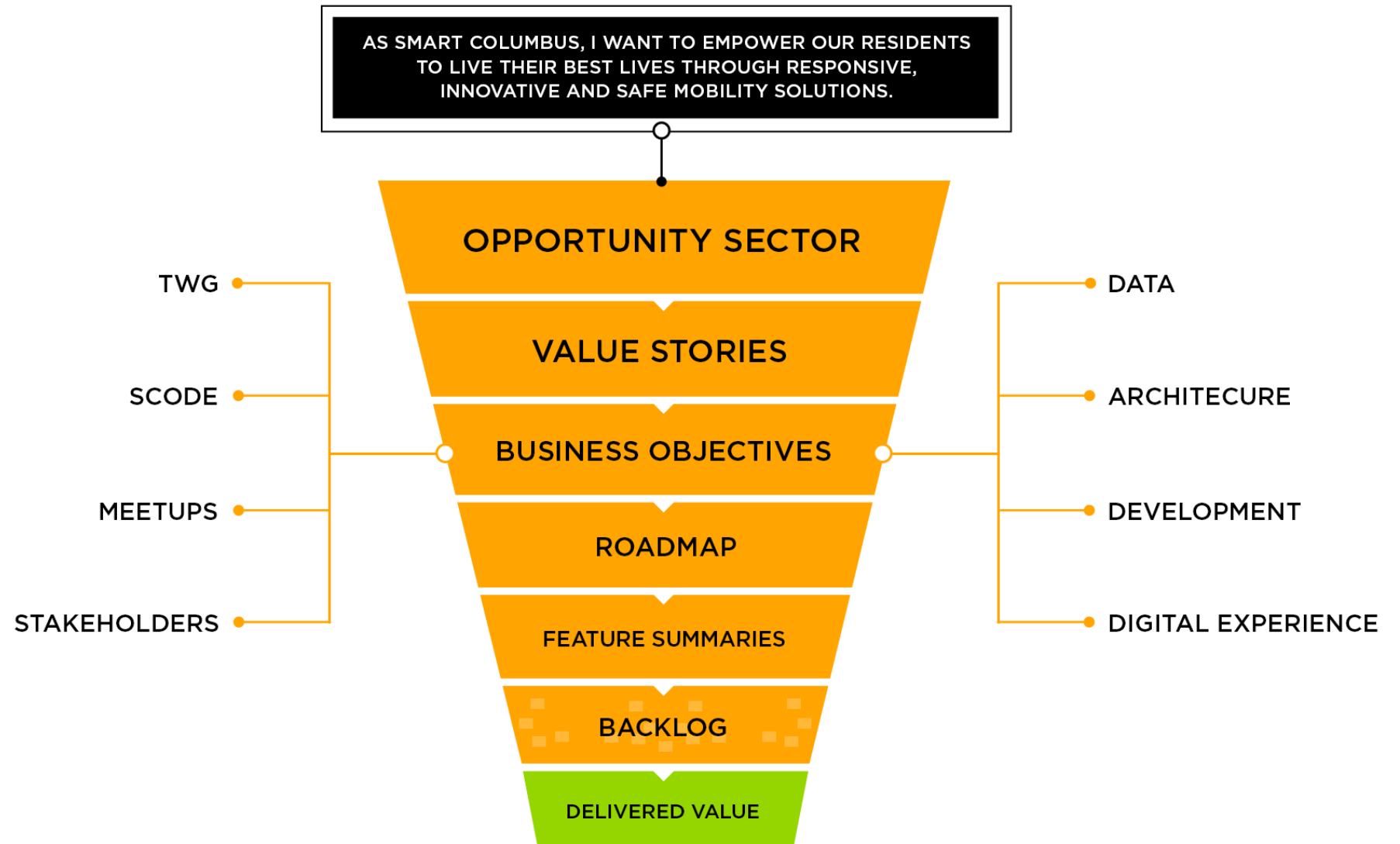
Not Just Incremental ... Building little bits at a time



Incremental AND Iterative

Building a rough version, validating it, and gradually improving it

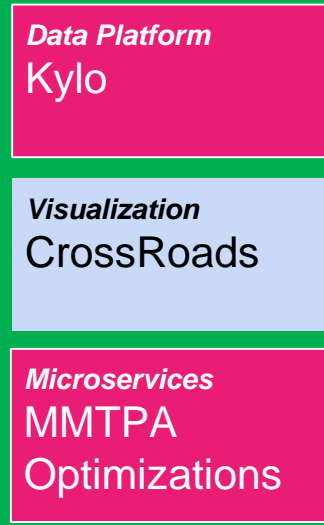
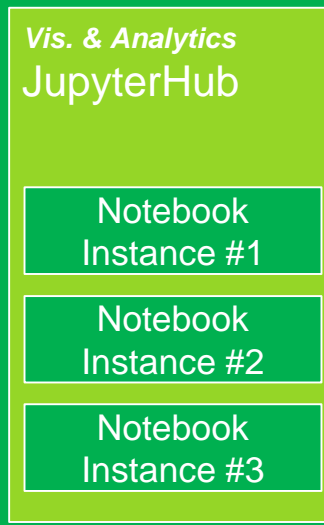
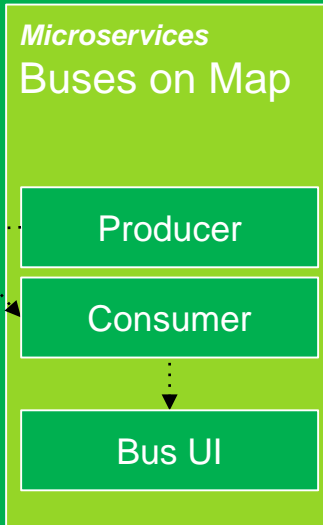
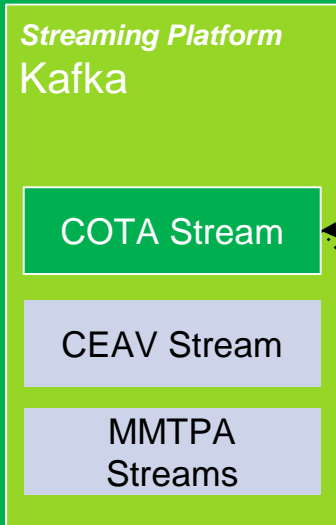




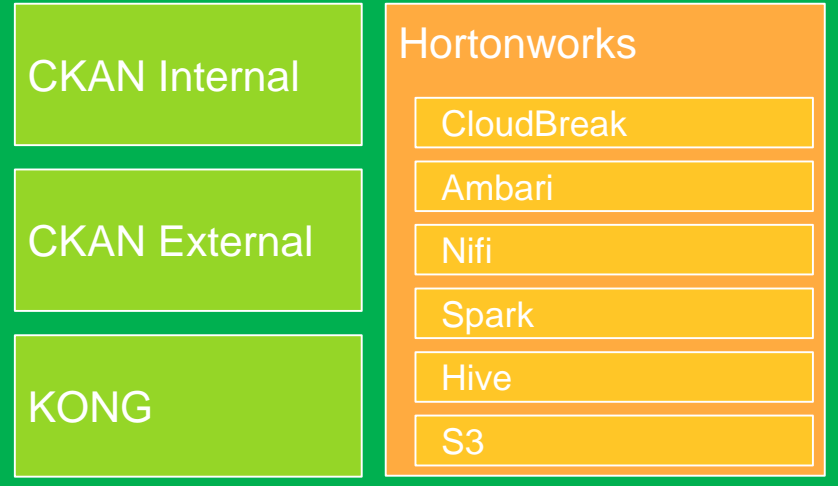
Computing Services

AWS

Computing Platform Kubernetes



Data Platform



Content Management



Key of Status: DEFINING PREPPING IN PROGRESS IN PRODUCTION NO LONGER REQUIRED

OPERATING SYSTEM DETAILS

ESSENTIALS OF THE OPERATING SYSTEM

Data Environment

- Data ingestion
- Streaming data
- Data tagging
- Data aggregation

Security

- Data encrypted in transit & at rest
- ID Access Management (IDAM)

Scalable Capacity

- Built with open source/open architecture
- Elasticity with AWS Cloud Services
- Microservices

Data Lake

- Fast and slow storage
 - Variety of data

Data Research Environment

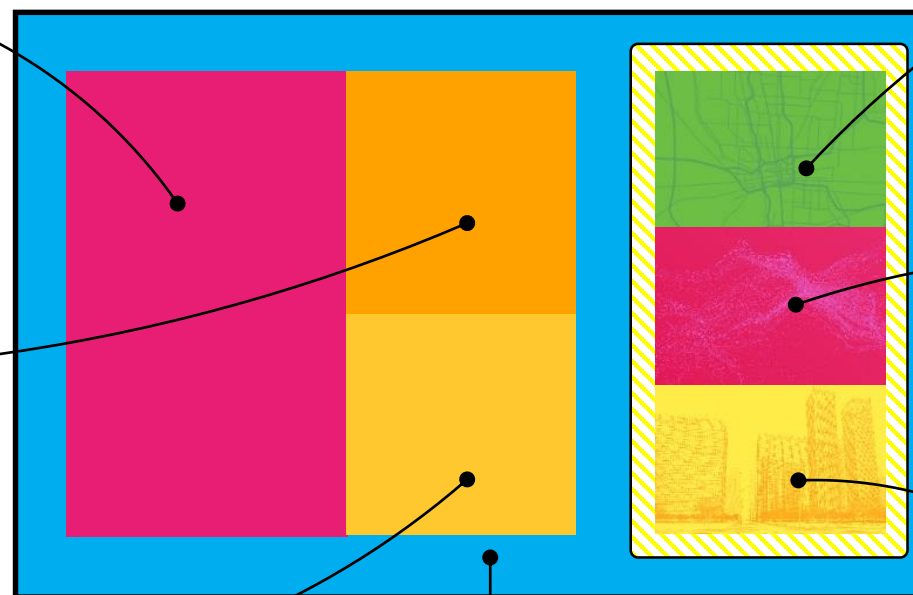
- Social community
- Data discovery
- Visualization
- User dashboards

Shared Services

- Application hosting
- Function sharing through microservices (real-time ML, route optimizer)

Analytics

- Core analysis tools
- Machine learning
- Artificial intelligence



OPERATING SYSTEM ROADMAP

Rolling 6 month view

PROGRAM MILESTONES

One KPI Per Project 10/2	CEAV–1st Streaming Shuttle 12/18	MMTPA Release 1 1/17	MMTPA Release 2 4/1	MMTPA Release 3 5/28
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OS PROD DATES

COTA Bus UI 10/2



FEATURES

KPI Support	Data Platform 2.0 <ul style="list-style-type: none"> ➤ Ingest ➤ Discover/use ➤ Streaming ➤ Migration 	MMTPA Data Integration	Machine Learning Support	Application Hosting	Data Discovery
Online Data Scientist Notebook			Centralized Account Management (IDAM)		Data / App Marketplace
			Service Security Model		Social
					Self-Service
					Re-Streaming



Essentials of the
Smart Columbus
Operating
System

DATA PRIVACY

HOW WILL SMART COLUMBUS PROTECT AND RESPECT PERSONAL DATA?

- Be transparent
- Provide choice
- Respect expectations





HOW WILL SMART COLUMBUS PROTECT AND RESPECT PERSONAL DATA?

- Minimize data
- Secure data
- Shield identity
- Be accountable



WHO WROTE THE DATA PRIVACY PLAN?

- The Village
 - Policy Track of the TWG
 - Experienced privacy professionals and academics
- Researched and incorporated best practices
- State of the art plan





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DATA MANAGEMENT

WHAT IS A DATA MANAGEMENT PLAN?

- A data management plan (DMP) is the overarching document providing guidelines on the treatment of data.



HOW DID WE DEVELOP THE DMP

- The Village
 - Policy Track of TWG
 - Experienced data professionals from local businesses



WHAT IS THE SMART COLUMBUS DMP?

- The DMP provides operational information for the use of the data within the Smart City Operating platform.
 - Utilizing best practices, the DMP offers standards on metadata management, data size, data acquisition, data access and data use.





Essentials of the
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Operating System

LESSONS LEARNED (SO FAR...) AND WHAT'S NEXT

OVERALL LESSONS LEARNED

- Agile is a cultural shift especially in government
- Always come back to the so what
- Center on the roadmap
- Managing in an agile world
- IT modernization is factor





PUBLIC COMMENTS

Public comment period open for the DPP and DMP :

- October 9th -17th
- Where to find it:
 - View the plans at: <https://smart.columbus.gov/projects>
 - Under "Department of Transportation Projects"
 - Direct link to DPP: <http://bit.ly/SCOSDPP>
 - Direct link to DMP: <http://bit.ly/SCOSDMP>
- How to comment:
 - Please email comments to: kldepenhart@columbus.gov
 - Subject line: SCOS /DMP / DPP Comments
 - Include your contact information
 - State whether or not you represent a vendor interest



WHERE WE GO FROM HERE



December Release



March Release

12/4

12/18

3/15

Data Platform 2.0

- Ingest
- Discover/use
- Migration

Streaming in Data
Platform 2.0

MMTPA Data
Integration

Machine Learning
Support

Centralized Account
Management (IDAM)

Service Security Model

smartcolumbusos.com



HOW TO STAY CONNECTED

USDOT SMART CITY CHALLENGE PROGRAM INQUIRES:

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SMART COLUMBUS INQUIRES:

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Project Manager
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Upcoming Smart Columbus Webinars:

- Smart Mobility Hubs
- Prenatal Trip Assistance
- Overview of Emerging Technologies:
Connected Electric Autonomous Vehicles and
Truck Platooning

Webinar recording and materials will be available at itsa.org and smart.columbus.gov



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SmartColumbus@columbus.gov

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QUESTIONS?

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