

Smart Columbus: The Projects and the Data

December 6, 2018



- Smart Cities Challenge
- Program Overview
- Projects
- Data
- What's Next





\$40 MILLION

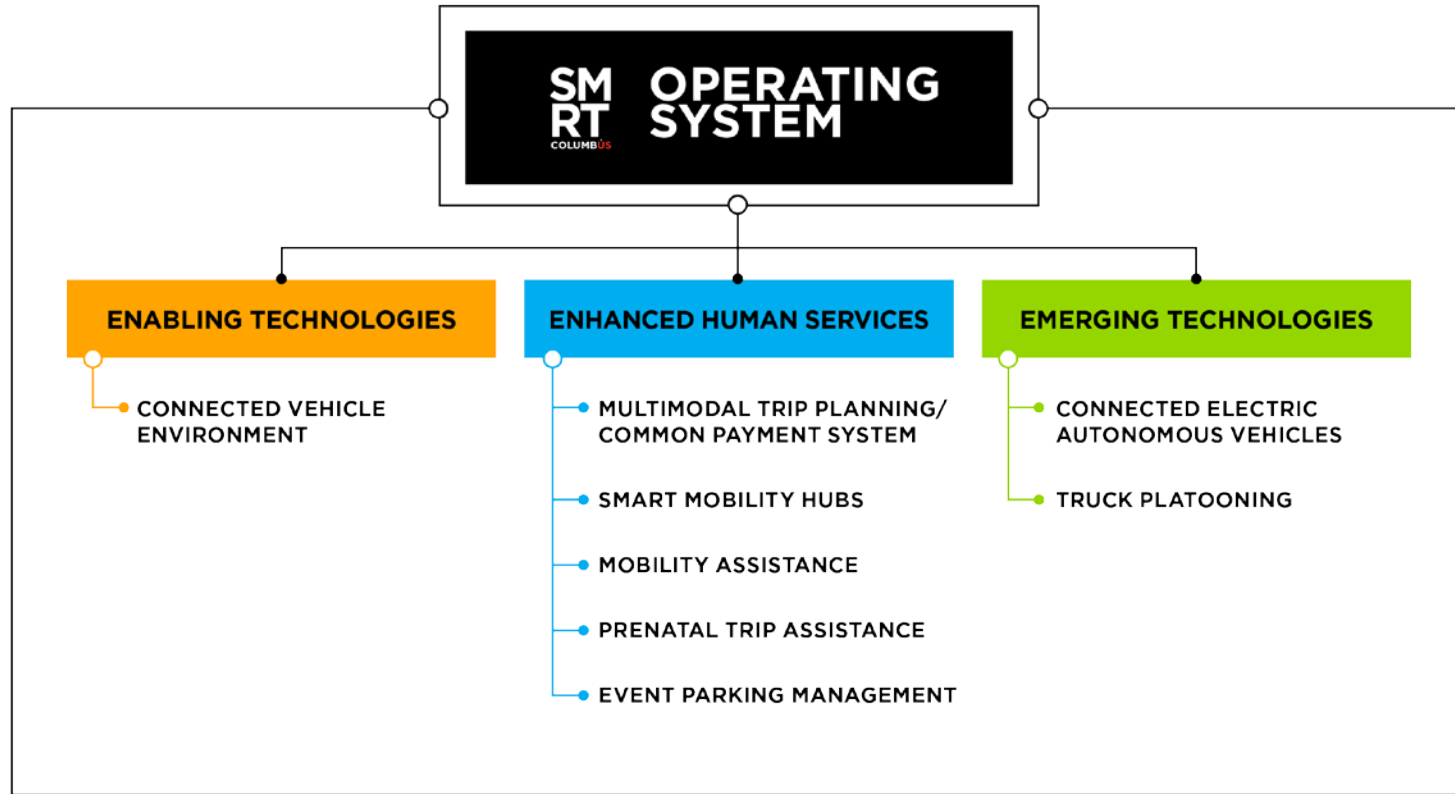
78 APPLIED • COLUMBUS WON

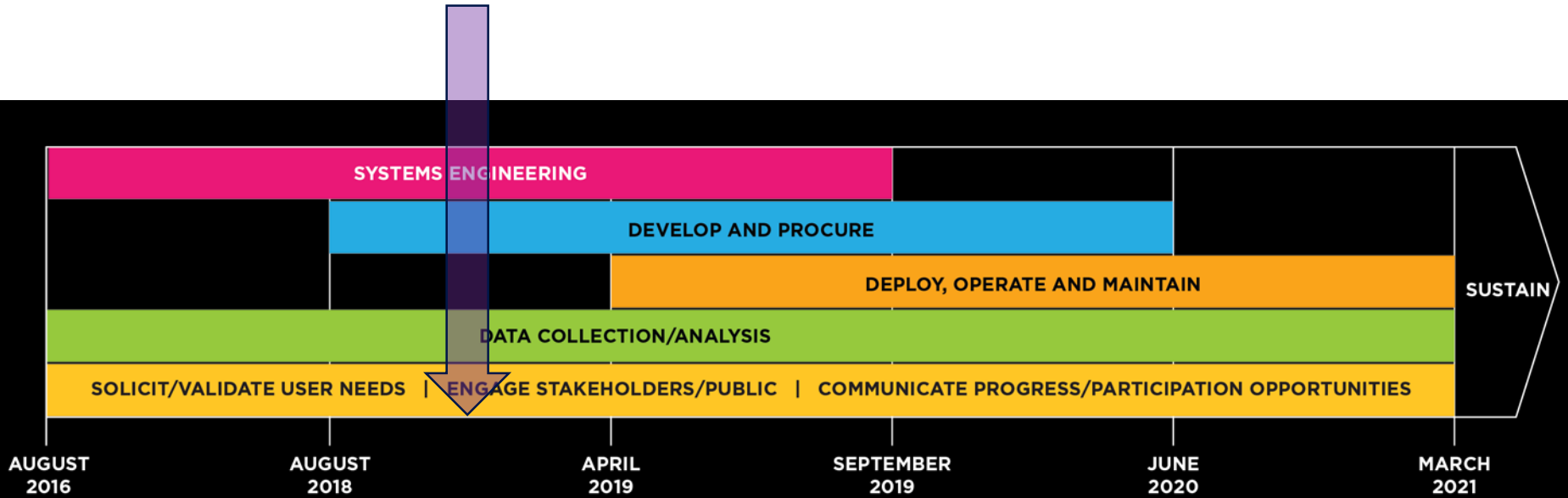


U.S. Department of Transportation

THE CITY OF
COLUMBUS
ANDREW J. GINTHER, MAYOR







ESSENTIALS OF THE OPERATING SYSTEM

Data Environment

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

Data Research Environment

- Social community
- Data discovery
- Visualization
- User dashboards

Security

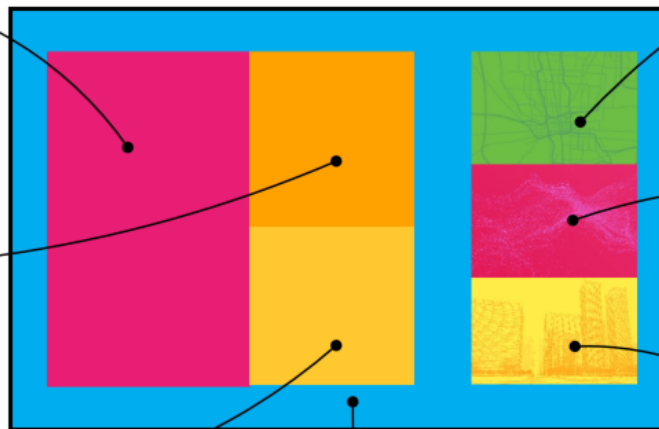
- Data encrypted in transit & at rest
- ID Access Management (IDAM)

Shared Services

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

Scalable Capacity

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



Data Lake

- Fast and slow storage capacity
- Only store what we must; leave data at native source (for security & storage mgmt.)

Analytics

- Core analysis tools
- Machine learning
- Artificial intelligence



THE PROJECTS

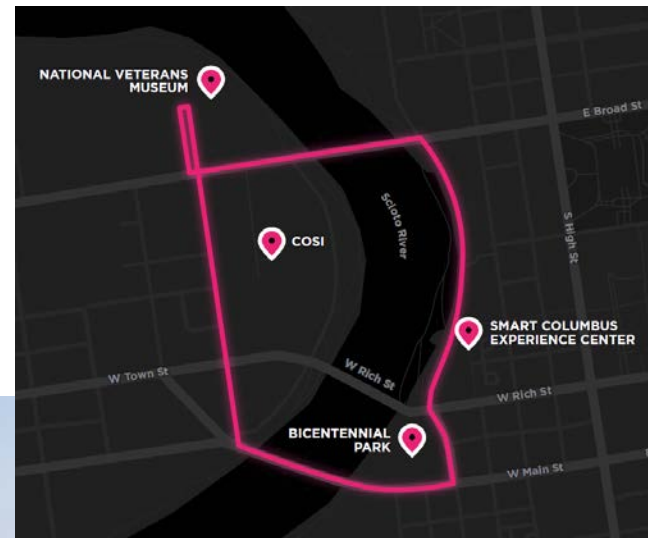


SMART CIRCUIT

- First AV deployment in Ohio
- Passenger service begins 12/10
- Serves public educational purpose and deployment learning for project team

CEAV Data

- Passenger survey
- AVL
- Passenger counts
- Battery performance
- Distance traveled



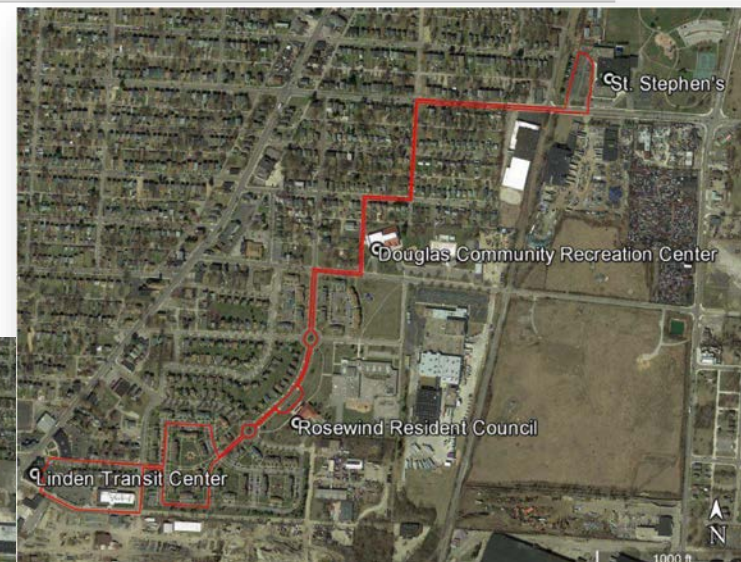


DEPLOYMENT #2

- Robust use case developed with community stakeholders
- Fill a transit gap and solve FMLM
- Connect to other modes of transportation

CEAV Data

- Passenger survey
- AVL
- Passenger counts
- Battery performance
- Distance traveled



MMTPA

- Selected Mtech to develop app based on OpenTripPlanner
- Application will be developed to link multiple modes into a single trip that user can select
- Utilize regional providers as well as national

CPS

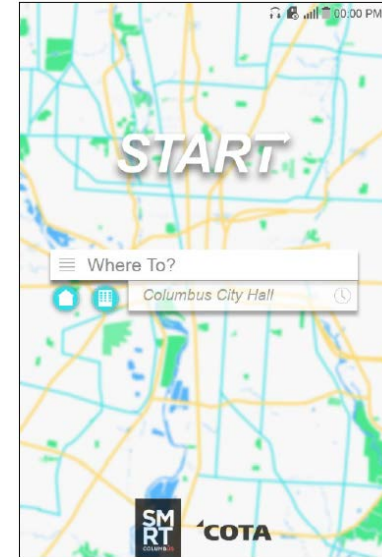
- Will be advertised next week
- First-of-its-kind common ledger system to allow for payments to be made to multiple providers with one click
- Account for the unbanked and underbanked



Data

- Number of executed transactions
- Mobility provider interview logs
- Customer surveys
- Changes in trip type (single mode vs. multimodal)
- Trip date and time
- Trip origin and destination
- Trip modes
- Increase in ridership by mode
- Number of trips booked through MMTPA
- Number of trips involving one or more mode shift
- Number of trips booked for each mobility provider
- Payment method by mode/service provider
- Payment amount
- Number of trips booked using CPS for payment

What do we do with the data?



SMH

- Locations
 - Columbus State Community College
 - Linden Transit Center
 - St. Stephen's Community Center
 - Columbus Metro Library – Linden Branch
 - Northern Lights Park & Ride
 - Easton Transit Center
- Amenities
 - Bike racks
 - Bike share
 - Car share
 - Kiosk/Wi-fi/USB charging/Emergency call button
 - Dockless parking area
 - Public transit
 - EV charging
 - Park and ride
 - Taxi/TNC pick-up/drop-off



2017 Infant Mortality Rates

Communities with high infant mortality rates may have higher medical care, education and workforce costs.

18,800

babies were born in Franklin County

6,658

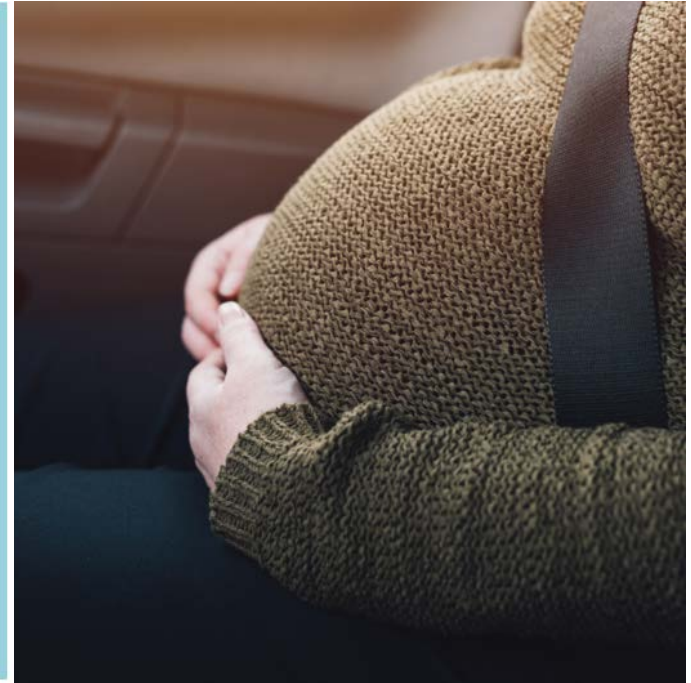
babies or 35% were born in CelebrateOne neighborhoods

155

babies died in Franklin County

79

babies or 51% died in CelebrateOne neighborhoods



PTA

- Recently selected vendor from RFP process
- Provide more reliable transportation to expectant mothers in the Linden neighborhood
- Track progress of expectant mothers from reporting birth through delivery

Data

- Time spent arranging a ride
- Time spent waiting on the A & B leg of trips
- Reliability of the service
- Journey time
- Safety/comfort of the vehicle
- Personal security
- Friendliness of staff arranging the trip / drivers
- Satisfaction survey



EPM

- Scope
 - 40,000+ spaces in parking garages
 - 30,000+ spaces in surface lots (estimated)
 - 4,300 parking meters
 - 130 loading zones
- Real-time information for parking availability
 - Predictive analytics for on-street meters
 - Actual availability / booking for garages and lots

Data

- Ungated parking facility
- Gated parking facility
- City parking meter system
- Probe vehicle data
- EPM Central System
- Personal Information device
- Common payment system information



CVE

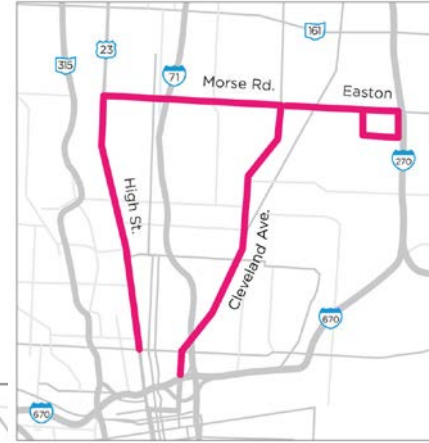
- Deployed in high crash locations
- Applications
 - Emergency electronic brake light
 - Forward collision warning
 - Lane change warning/Blind spot warning
 - Intersection movement assist
 - Red light violation warning
 - Reduce speed school zone
 - Transit signal priority
 - Emergency vehicle preemption
 - Freight signal priority
 - Intent to platoon priority
 - Vehicle data for traffic operations
 - Transit vehicle interaction event recording

Vehicle Type		Quantity
Light-Duty Vehicle	Private Vehicle	1019
	City Fleet Vehicle	200
	COTA Supervisor Vehicle	25
Emergency Vehicle	Fire Truck/EMS	30
	Police Cruiser	80
Heavy-Duty Vehicle	Platoon Truck	10
Transit Vehicle	CEAV	6
	COTA Transit Bus* (fixed-route)	350
	COTA Paratransit Bus	80
Total		1,800



Data

- Collision warning information
- Driver update information
- Host vehicle status
- Vehicle location and motion data
- Remote vehicle OBE
- Vehicle database
- Vehicle Basic Safety
- Signal Phase and Time (SPaT)
- MAP messages
- Vehicle control event

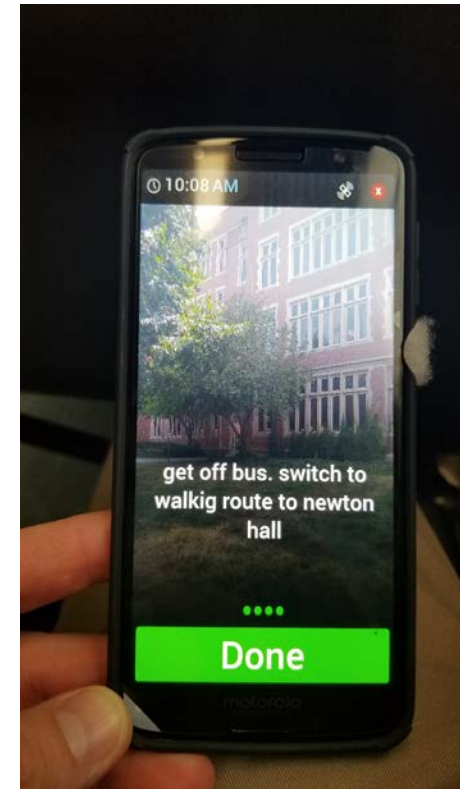


MAPCD

- Cognitive Disabilities include:
 - Autism
 - Down Syndrome
 - Traumatic Brain Injury
 - Dementia
 - Attention Deficit Disorder (ADD)
 - Dyslexia
 - Learning disabilities
- Selected WayFinder app by AbleLink

Data

- Starting a particular route
- Completing / pausing / resuming / canceling a route
- Loss / Reacquisition of GPS connection
- Leaving / reentering the travel corridor for the route
- Requests for assistance



QUESTIONS?



Michael Baker

INTERNATIONAL

We Make a Difference

Jeffrey J. Kupko, P.E., PTOE

jeffrey.kupko@mbakerintl.com

717-856-7907

