



# Smart City Hackathon

Powered by



# Welcome!

@SmartCbus  
#smartcbus  
#hackSCOS

wifi:  
Fintech71 5G or 2G

pw:  
GhostFin71



Welcome, welcome, welcome to whatever this is.

A circular portrait of John Oliver, a man with dark hair and glasses, wearing a grey suit and a blue plaid shirt. He is smiling slightly and looking towards the camera. The background is a blurred studio set.

welcome,  
welcome,  
welcome!

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# Hi, I'm Jay Clouse



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MATT CHIMES  
MARKET INTELLIGENCE  
ASSOCIATE - REV1 VENTURES



LAUREN D'SOUZA  
LEAD GEN MANAGER -  
CROSSCHX



SANDHYA ELANGO  
GRAPHIC DESIGNER -  
OSU COLLEGE OF NURSING

we are here to  
**build something awesome.**



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# SEARCH OUR OPEN DATASETS

The Smart Columbus Operating System features an Open Data Platform, which provides anytime access to the city's latest mobility data.

We challenge and encourage you to use our data to solve mobility challenges in innovative ways.

Search Datasets...



THE POWER OF DATA



DATA



DATA STORIES

# our goals for the weekend...

1. Leverage available data to solve problems
2. Find new insights within the data
3. Help us identify other problems and opportunities
4. Help us to learn and improve the tool
5. Make friends
6. Have fun



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# tonight's agenda...

1. Welcome + introduction
2. Opening remarks
3. Overview of Smart Columbus
4. Overview of the Smart Columbus Operating System
5. Introduction of Featured Use Cases
6. Open pitches
7. Team formation
8. Dig in!



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we have **a lot** to get through.



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what is a “**Smart City**”?



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**\$50 MILLION**  
78 APPLIED • COLUMBUS WON



THE CITY OF  
**COLUMBUS**  
ANDREW J. GINTHER, MAYOR



U.S. Department of Transportation

# Council President Pro Tem **Michael Stinziano**



#SmartCbus



Director, Smart Columbus  
**Jordan Davis**



## VISION STATEMENT

Our goal for the future

**TO BE THE MODEL FOR  
CONNECTED CITIES OF  
THE FUTURE**

## MISSION STATEMENT

What we want to do now

**TO ACCELERATE HUMAN  
PROGRESS THROUGH  
OPEN MOBILITY**

## PURPOSE STATEMENT

What we want to do now

**WE ARE LEADING COLUMBUS  
TO THE FUTURE, AND  
ENSURING YOUR PLACE IN IT**

**SM  
RT  
COLUMBUS**



## QUALITY OF LIFE

- Connect people to employment and opportunity: including improving access to healthcare and fresh food
- Increase personal **mobility efficiency**
- **Attract and retain talent** with a desirable lifestyle
- **Alleviate the daily stresses** of traffic and congestion

## WHY?

- The industry change is coming
- Expected population growth of 1 million people
- One of the most economically segregated cities in the nation
- Regional sprawl

## ECONOMIC GROWTH

- Future-proof our economy by **attracting and creating new jobs** in emerging industries
- Prepare our existing **workforce** for the future
- **Pivot** existing industries to own the future.
- Incorporate “smart thinking” into real estate development



**\$40 Million  
Cash**

**Led by  
City of Columbus**

**Four Years  
August 2016 -  
August 2020**



**\$10 Million  
Cash**

**Jointly Executed by  
City of Columbus &  
Columbus Partnership**

**Three Years  
April 2017 -  
April 2020**

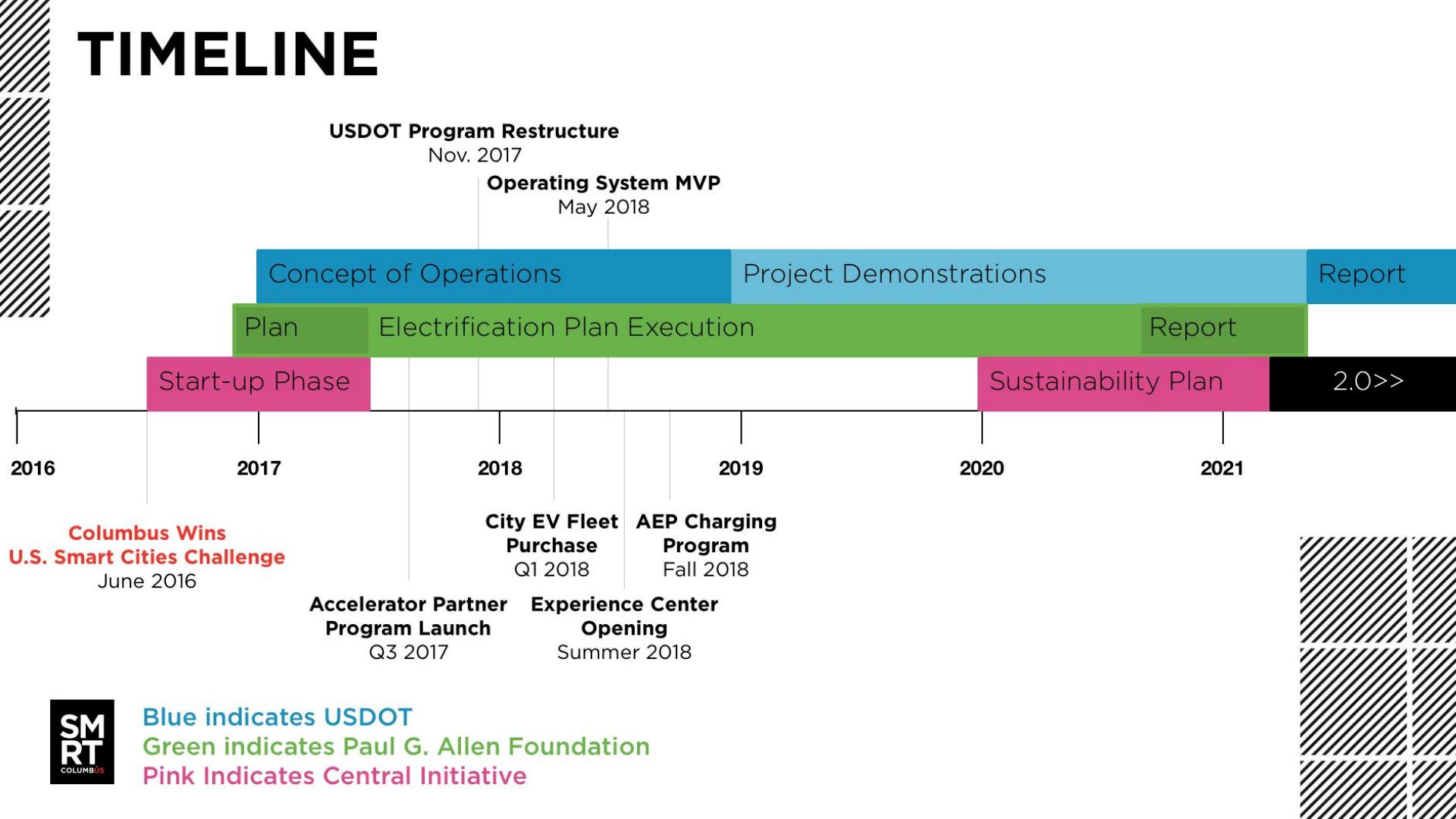
**Columbus  
Acceleration  
Fund**

**\$12 Million  
Cash  
\$500 Million  
Program  
Investments**

**Coordinated by  
Columbus Partnership**

**Ongoing  
\$1 Billion Goal by  
December 2020**

# TIMELINE



**THINK BEYOND**  
**WHAT VALUE MIGHT WE  
CREATE BY LEVERAGING THE  
TRANSFORMATIONAL  
POTENTIAL OF DATA?**

# Technical PM to Smart City **Brian King**



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## OPERATING SYSTEM

PUBLISH AGGREGATE CONSUME FUSE VISUALIZE

DATA STORAGE & CURATION





# OPERATING SYSTEM

## ENABLING TECHNOLOGIES

- CONNECTED VEHICLE ENVIRONMENT

## ENHANCED HUMAN SERVICES

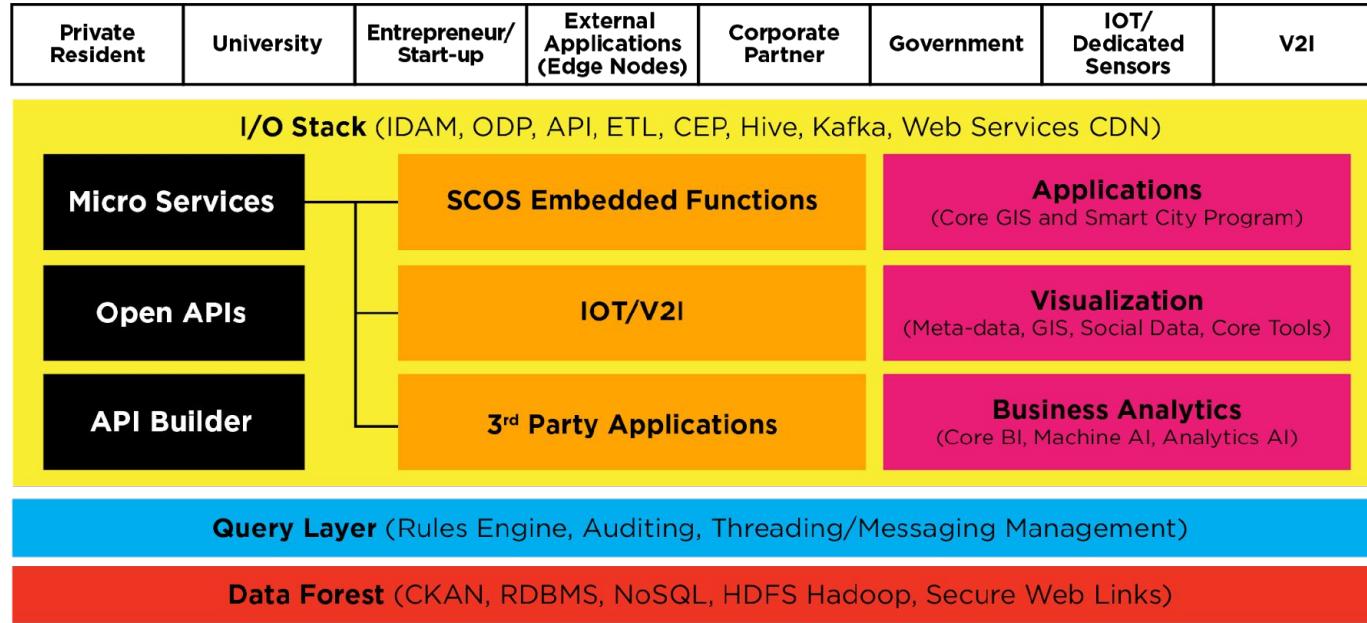
- MULTIMODAL TRIP PLANNING/COMMON PAYMENT SYSTEM
- SMART MOBILITY HUBS
- MOBILITY ASSISTANCE
- PRENATAL TRIP ASSISTANCE
- EVENT PARKING MANAGEMENT

## EMERGING TECHNOLOGIES

- CONNECTED ELECTRIC AUTONOMOUS VEHICLES
- TRUCK PLATOONING

## PROGRAM MANAGEMENT TOOLS & DELIVERABLES

# SM RT COLUMBUS OPERATING SYSTEM



Data Encryption TLS (At-rest, In-transit)

Security Management

## LAYERS

Governance

System

Logic

Control

Service

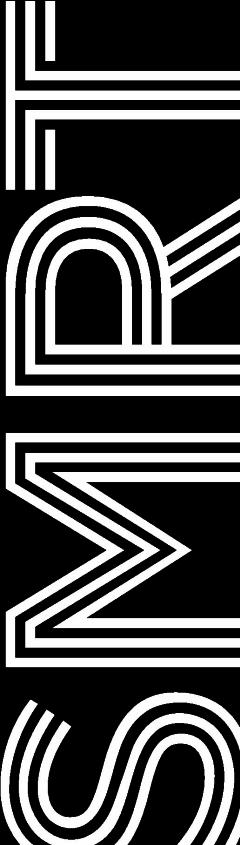
MicroServices

Transaction

Data

# SCOS TIMELINE

MARCH – APRIL 2018	MAY – JUNE 2018	JULY– DEC 2018	JAN-MAR 2019
<ul style="list-style-type: none"><li>• Open Data Portal Launch 4/3</li><li>• Harvesting Static Data Feeds</li><li>• DevOps Started</li><li>• Metadata &amp; Security Design</li><li>• Use Case Development</li></ul>	<ul style="list-style-type: none"><li>• Hackathon May 18-20</li><li>• DevOps Implemented</li><li>• Design Plans for Metadata and Security</li><li>• Streaming Data</li><li>• Onboard Pillar</li></ul>	<ul style="list-style-type: none"><li>• Core Big Data Architecture Built</li><li>• Microservices</li><li>• Visualization</li><li>• IoT Gateway</li><li>• Master Data Management</li><li>• ID Access Management</li></ul>	<ul style="list-style-type: none"><li>• First data from SC Projects; Mobility Assistance &amp; Prenatal</li></ul>



# SUSTAINABILITY

## THE COLUMBUS WAY!



- Open Data | What is the City's plan for Open Data?
- Data Modernization | legacy system compliancy and refinement of current data
- Liability | when data is found by a user to not be accurate – who is accountable?
- Governance | Business Processes for User Account Management & Monitoring, Security
- Productization | Maintaining the SCOS will have ongoing costs. A business model to allow for charging to access or publish data is needed to cover costs and serve as revenue engine.

so how will this work?



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# Goals for tonight:

- Become familiar with the Featured Use Cases
- Pitch your own smart city / data-related ideas
- Form teams for the weekend around a problem you care about
- Begin familiarizing yourself with the Smart Columbus Operating System (SCOS)



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# Weekend Roadmap

## Tonight

Use Cases

Pitching

Form teams

Exchange  
Contact info

Brain Dump

Weekend  
Deliverables

# Weekend Roadmap

Saturday

Use Case  
workshops

SCOS Workshop

Start Building

Mentors

Customer  
Validation

Iterate

Keep Building

# Weekend Roadmap

Sunday

Team  
Registration

Build

Build

Build

Build  
Presentation

Pitch Practice

Tech Check

Final  
Presentations!

by the way, this wouldn't be  
possible without our **sponsors**.



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FINTECH 7/



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# THE OHIO STATE UNIVERSITY

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# pililar



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# Judging Criteria

# User Validation

Does your solution align  
with a real problem?

Have you identified a  
target user?

Who did you talk to?

# Technical execution and design

## Factors:

- Creativity
- Insightfulness
- Technical difficulty
- Functionality
- Intuitiveness

# Business Model

What is the impact this can  
create?

How can this sustain itself or  
make money?

# Featured Use Cases



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# Columbus Parking Services

Rama Boyapati

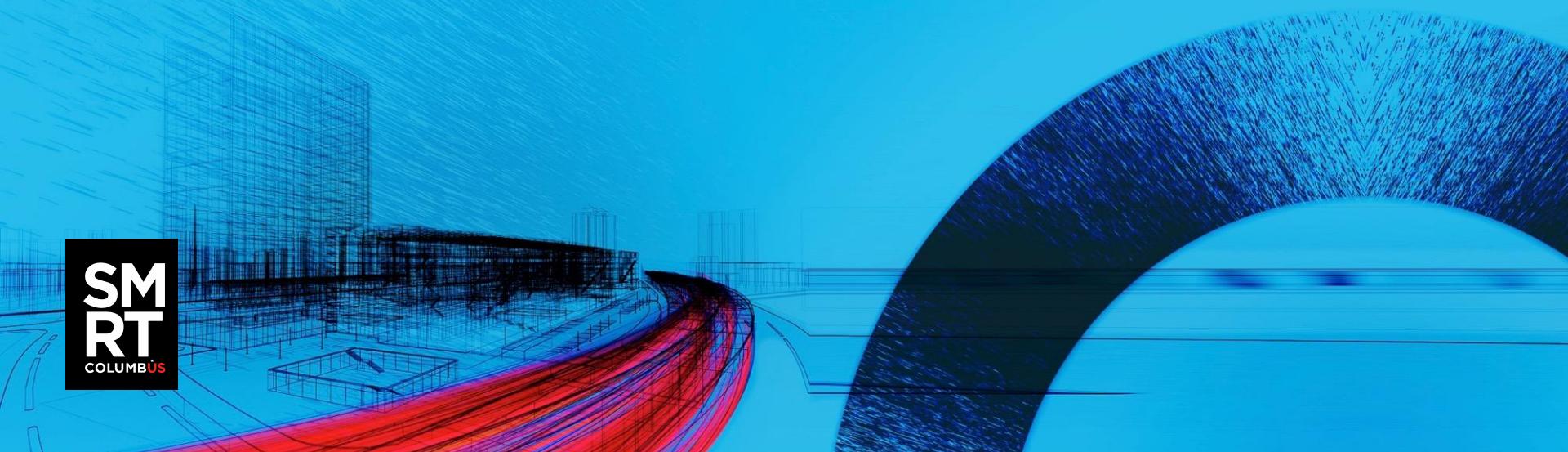


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# Enhanced Data Analytics and Visualization for Columbus Parking Services

- Context
- Problem statement
- Opportunity!
- What success looks like



# Context – Current Scenario

- Currently, Columbus parking services is executing a manual approach of depiction and analysis of real time and historic data for identifying the performance statistics at the city level
- Current analytics techniques offer limited guidance in making data-driven decisions
- Currently, \$3.5 Mn of citations account for unpaid citations
- In 2018, 27.5% of all appealed citations have been dismissed

# **Problem Statement**

*Pioneer user-friendly solutions to enhance the capabilities of Columbus Parking Services in providing better parking solutions and addressing the current violations*

# Opportunity

## DATA AT HAND

- Parking meter locations, hours of operation, rate, and historic transactions
- Parking violations, cause of violations, disposition status, and violation charges

*...FEEL FREE TO ACCRUE ADDITIONAL DATA TO POWER YOUR SOLUTION*

# **What Success Looks Like...**

- Allow CPS to identify the variability in parking demand at a block or zone level on a map
- Identify interdependencies between metrics like parking time vs. parking rate
- Allow PEOs to select the optimized route for identification of maximum number of citations based on locations with historic violations
- Allow CPS to identify the leading causes of dismissed citations

# **What Success Looks Like...**

- *Recommend plans to meet future parking demand*
- *Easy-to-use dashboard interface accessible via web and mobile app*
- *Allow residents to park near their destination quickly, economically, and legally*
- *Allow navigation app providers to use parking data more efficiently to serve their users*

**...EXPLORE, HACK AND EXPAND!**

# Heartbeat of the City

Aaron Schill, Richard Jones

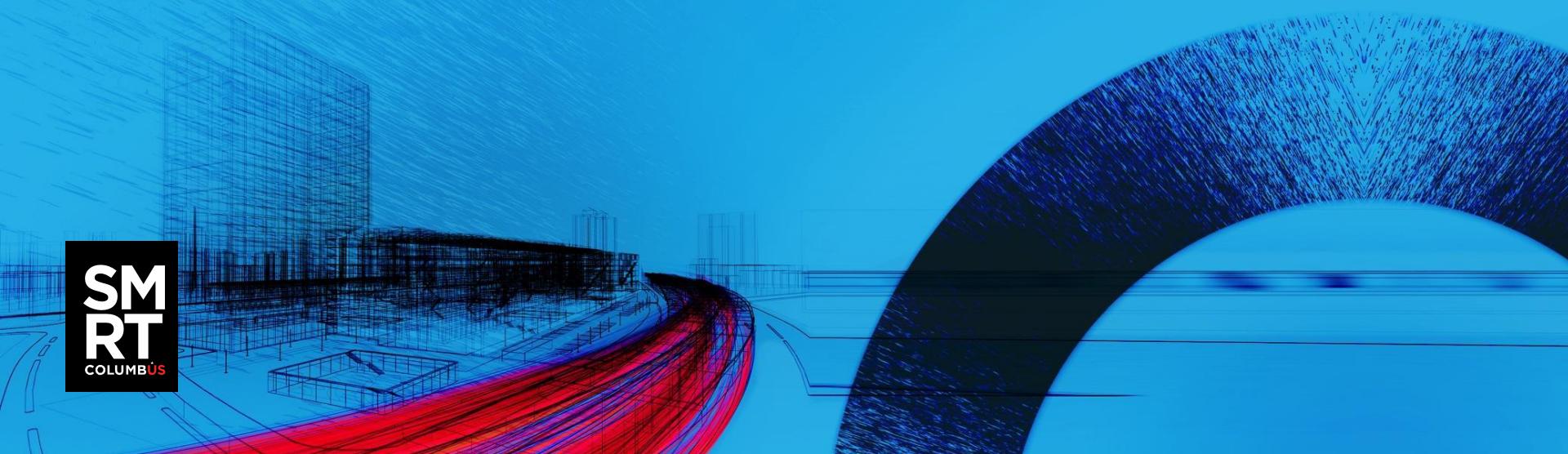


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# HEARTBEAT OF THE CITY

- Context
- Problem Statement
- Opportunity
- What success looks like



**305,959**

**Crashes**

**9,207**

**Serious  
Injuries**

**112,276**

**Injuries**

**1,133**

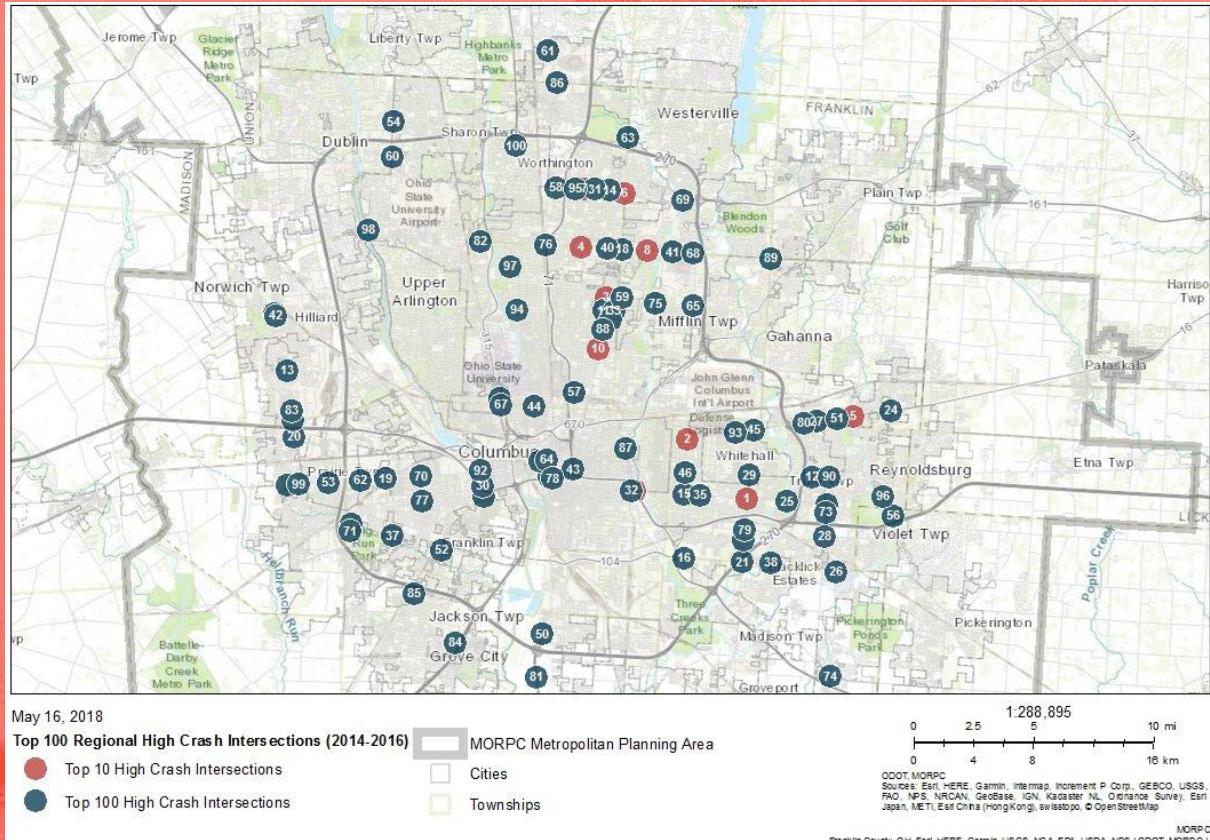
**Fatalities**

# LOCAL CONTEXT

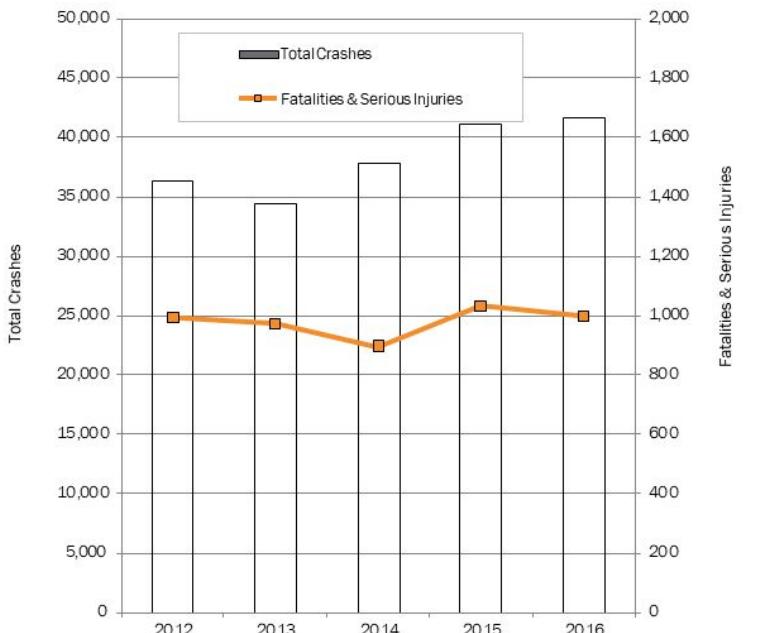


## STATE OF SAFETY REPORT (2012 - 2016)

MARCH 2018



# LOCAL CONTEXT



OVERALL CRASH TRENDS, 2012 TO 2016

## TRANSPORTATION SAFETY PERFORMANCE MEASURES

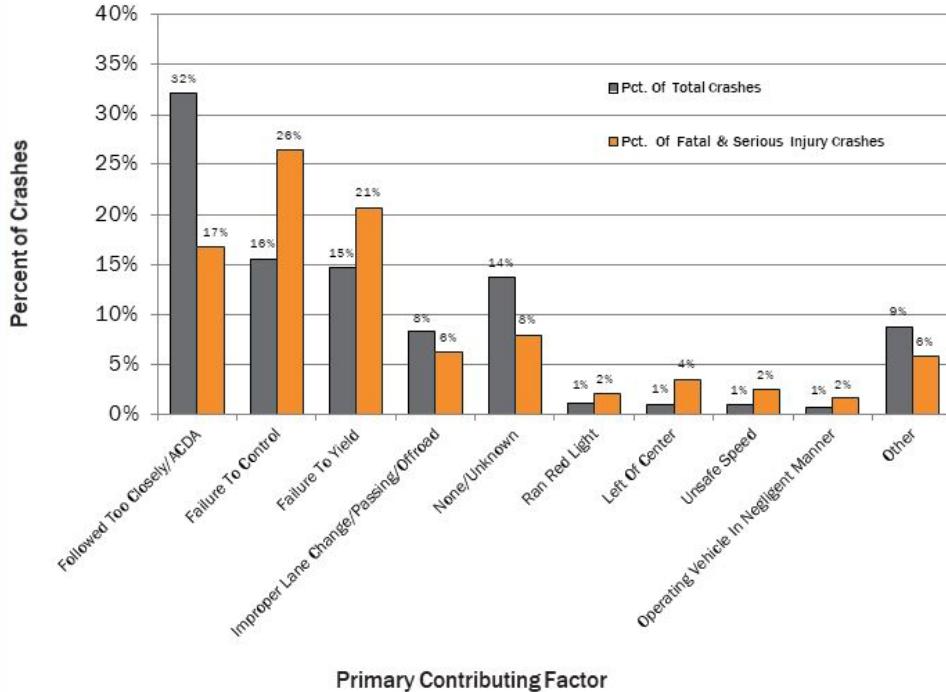
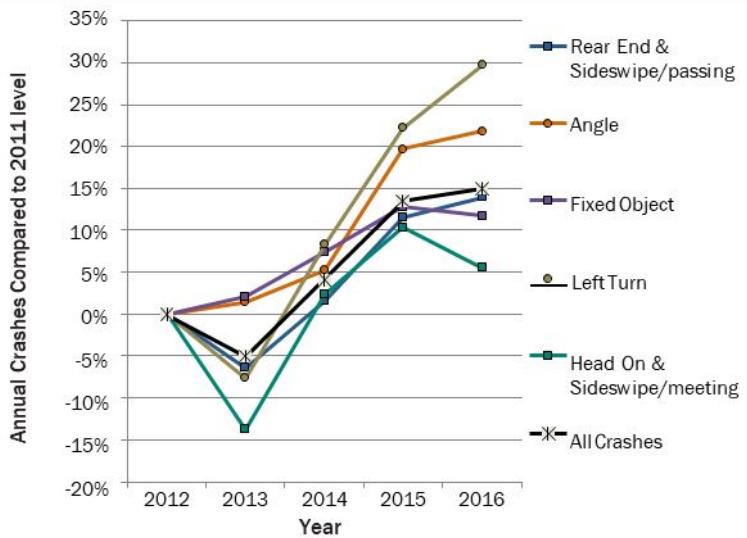
Performance Measure	2015 Benchmark	2020		2040		2017 Grade
		Target	Track	Target	Track	
Number of fatalities	<b>96</b>	<b>-10%</b>	<b>10.2%</b>	<b>-39%</b>	<b>27.2%</b>	X
Number of serious injuries	<b>890</b>	<b>-10%</b>	<b>-7%</b>	<b>-39%</b>	<b>-32.9%</b>	X
Number of non-motorized fatal & serious injuries	<b>138</b>	<b>-10%</b>	<b>22.7%</b>	<b>-39%</b>	<b>180.5%</b>	X
Rate of fatalities per 100 million VMT	<b>0.69</b>	<b>0.63</b>	<b>0.76</b>	<b>0.42</b>	<b>0.86</b>	X
Rate of serious injuries per 100 million VMT	<b>6.40</b>	<b>5.83</b>	<b>5.95</b>	<b>3.91</b>	<b>4.21</b>	X

Notes

- The benchmark and targets represent five year rolling averages
- Million Vehicle Miles Traveled (MVMT)
- "TARGET" = Performance target included in the 2016-2040 MTP
- "TRACK" = Progress should current trends continue

✓ On track to meet target  
✗ Not on track to meet target

# LOCAL CONTEXT



**PRIMARY CONTRIBUTING FACTORS (EXCLUDING PED/BIKE)**

# PROBLEM STATEMENT

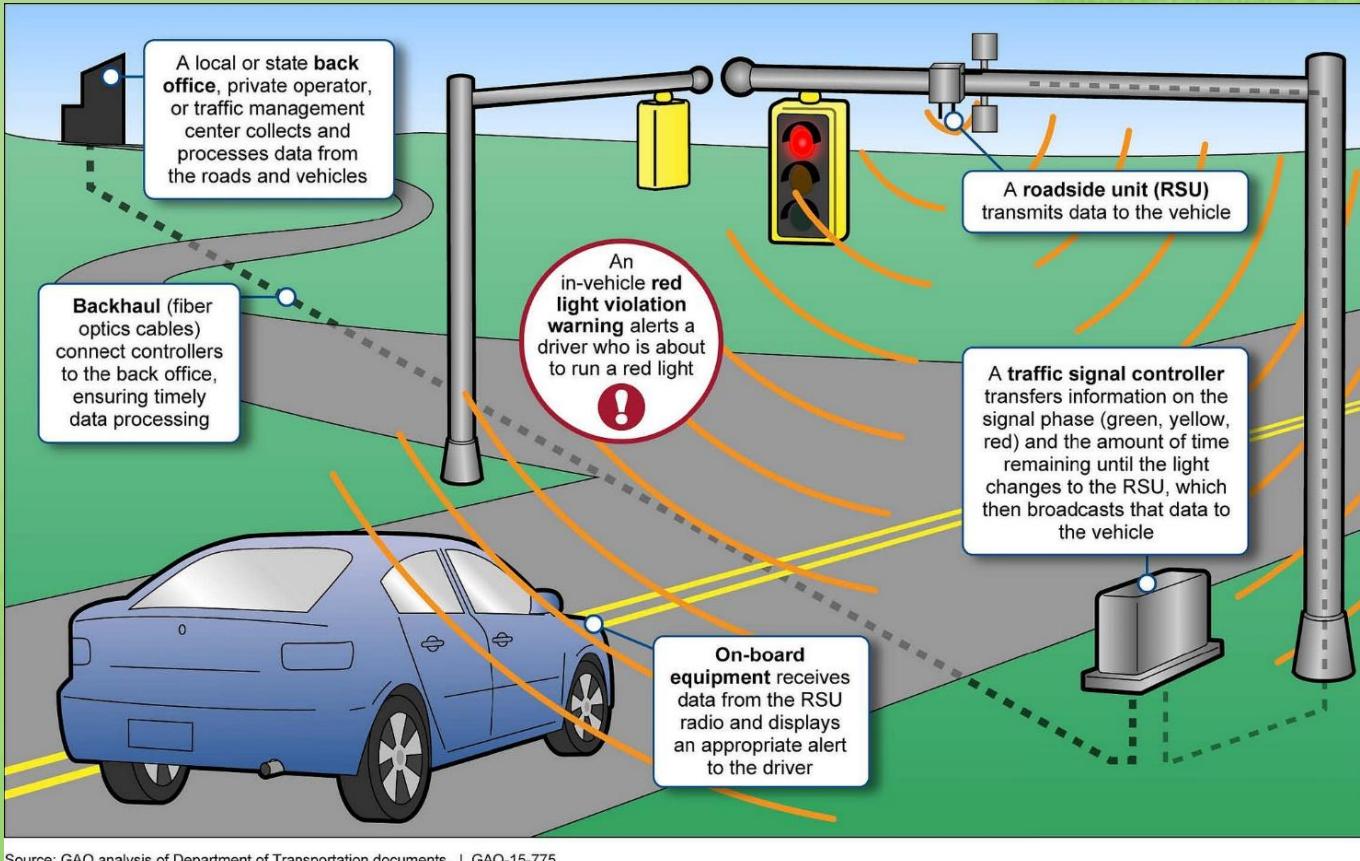
*Those responsible for improving the safety, efficiency, and operations of our transportation network must currently rely on incomplete and outdated information.*

*Ready access to timely and relevant data would allow for proactive safety improvements that prevent crashes, location-specific maintenance and weather treatment that occur in real-time, and a more efficient transportation network for all users.*

# WE HAVE THE PROJECTS & THE PEOPLE!



# WE HAVE THE TECHNOLOGY!





# AND NOW WE HAVE THE DATA!

- Transportation inventory data
  - Road centerlines & intersections
  - Road signs, guardrails, noise walls, street lights
  - Ped/bike infrastructure
- In-vehicle sensor data from Honda, Geotab, & Yellow Cab
  - Horizontal & vertical accelerometer
  - Weather conditions
  - Average road speeds
  - Idling hot-spots
  - Road impediments
- Emergency services incidents and responses
- Crash data
- Traffic characteristics
  - Average daily traffic
  - Speed limits
- Traffic and environmental citations

# WHAT SUCCESS LOOKS LIKE

- **Access** – solutions utilize the SCOS to access real-time & archival data about the transportation network from disparate sources (public and private)
- **Usage** – solutions allow query, analysis and sharing (products and derivatives)
- **Visualize** - solutions allow for analysis and presentation of data

## POTENTIAL HIGH-LEVEL TEST CASES

- **Predictive safety analytics** – tools used to analyze multiple data sources to identify and improve problem areas to improve safety and system efficiency
- **Emerging uses of Telematics** – design methodologies of use, create insights, invent new products from new data sources (Fleet data, environmental sensors, etc.)
- **Rapid Response** - alerts to traffic management centers and maintenance crews when unsafe conditions occur – signal malfunction, road obstruction, snow/ice
- **Visualize the Heartbeat** - live view of how things are moving & interacting throughout the city – traffic flows, signals, crosswalks, school & construction zones
- **Coordinated Traffic Control** - development of a complete regional traffic signal timing dataset and tools to analyze, experiment and improve



**Crashes**



**Injuries**

**0**

**Serious Injuries**

**0**

**Fatalities**

# Food Access For All

Mark Mollenkopf, Ayaz Hyder, Ernest Perry



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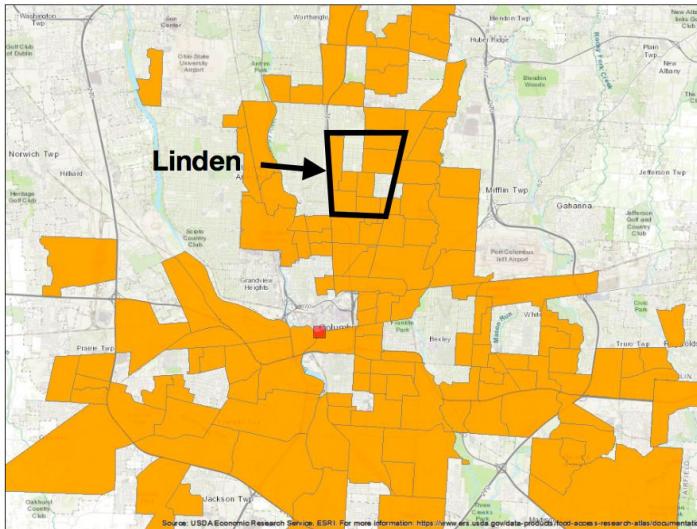
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# FOOD ACCESS FOR ALL

A Use Case for the Smart Columbus Hackathon  
May 18-20, 2018 - Columbus, Ohio

## What is Food Insecurity?

**Definition:** “is a household-level economic and social condition of limited or uncertain access to adequate food.”—USDA definition



**Map of Census Tracts in Franklin County that have low food access**

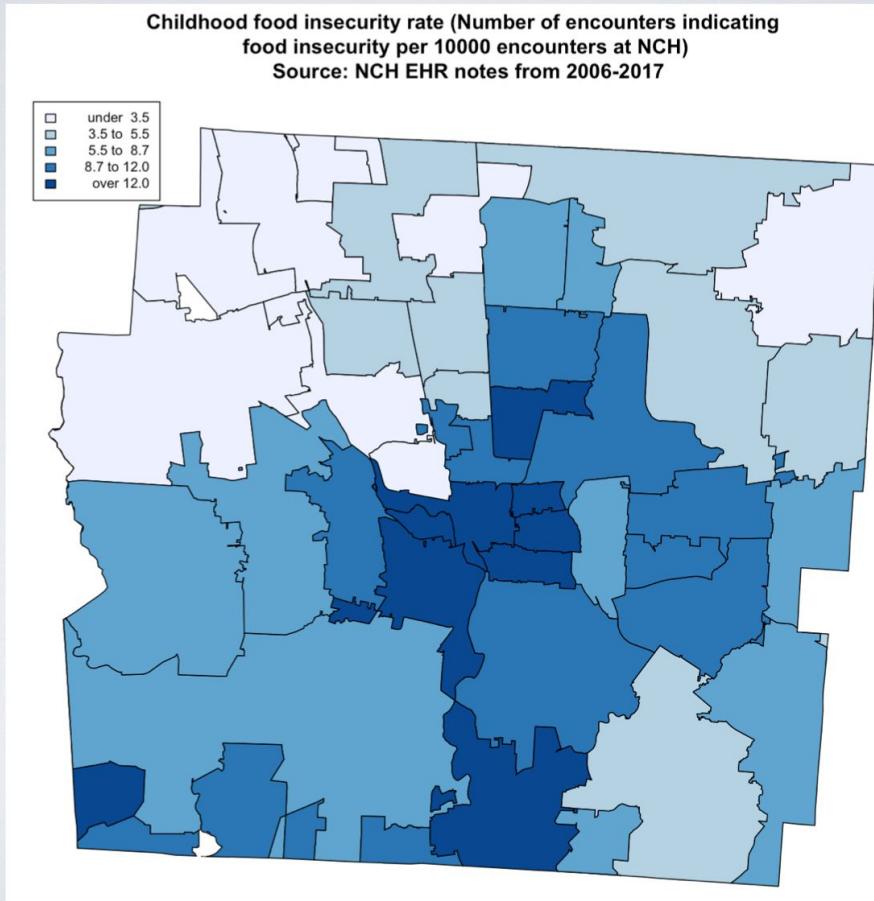
16% (range: 8.7%-20.4%) of Ohio households are food insecure.

Addressing food insecurity means addressing access, availability AND affordability of healthy food.

Food insecurity associated with several short- and long-term physical and mental health conditions.

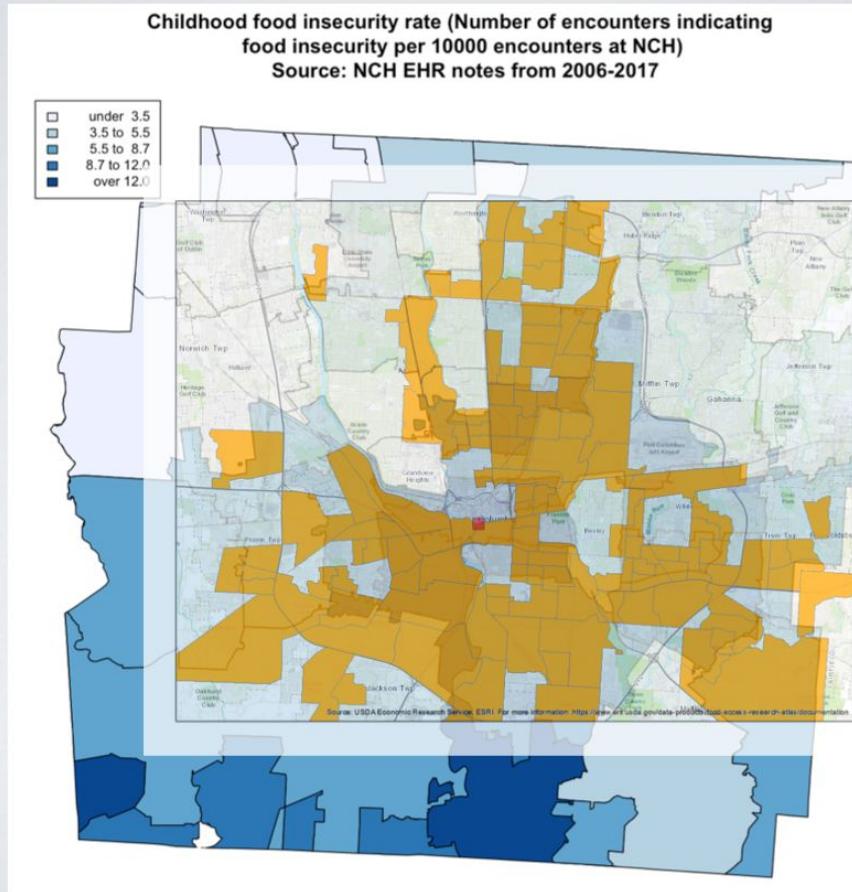
# Childhood Food Insecurity

Source: Nationwide Children's Hospital Data Science Team



# Childhood Food Insecurity

Source: Nationwide Children's Hospital Data Science Team



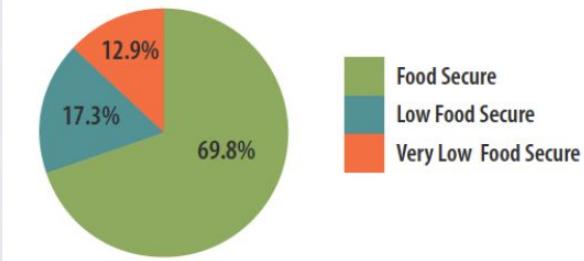
# Food Access in Two Neighborhoods

Source: Michelle Kaiser, PhD, College of Social Work, OSU

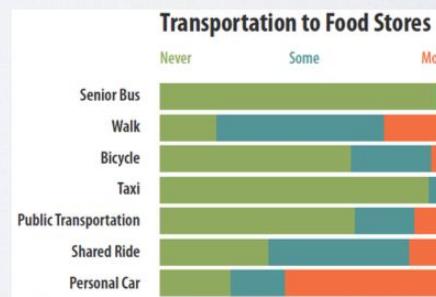


## Food Security

We used the six-item USDA food security module to assess food insecurity. Indications of food insecurity, such as having to skip meals, limit dietary intake, or adjust diets due to limited resources are categorized as Low Food Secure and Very Low Food Secure (formerly Food Insecure with Hunger).



\*Feeding America estimates that Franklin County has a food insecurity rate of 17.9% (this number combines categories Low Food Secure and Extremely Low Food Secure)



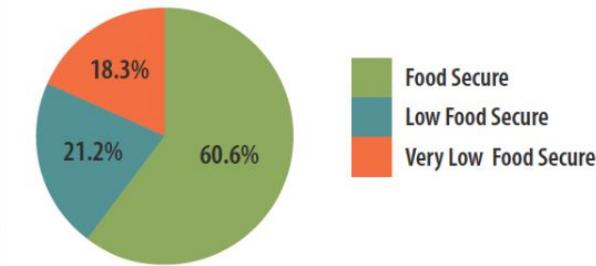
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## Food Security

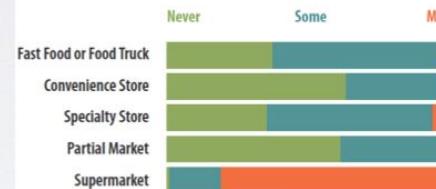
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## Where Food is Purchased



## Transportation to Food Stores



# **Food Access Use Case**

## **THE PURPOSE**

### **FOR FAMILIES:**

Provide families looking for emergency food supply a clear path to access food based on their **transportation needs, location, demographics** and **food preferences**.

### **FOR PANTRIES:**

Identify **shifts in demand** for emergency food and **coordinate the response** of providers in a fair and equitable manner.

### **FOR COMMERCIAL FOOD VENDORS:**

More **efficiently** and **effectively donate food** to these **pantry** food systems, while still achieving **profit** for their business as they address food security challenges within the communities they serve.

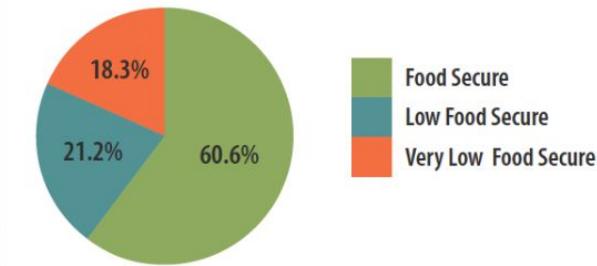
# Food Access in Two Columbus Neighborhoods

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## Food Security

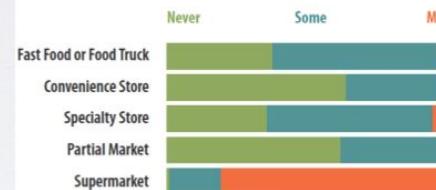
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## Where Food is Purchased



## Transportation to Food Stores



# **Food Access Use Case**

## **THE NEED**

### **FOR FAMILIES:**

- Connect person/family in need to a resource
- Know available food resource
- Recommend transportation, i.e. a way to get to pantry

### **FOR PANTRIES:**

- Recommend new modes of delivery between the provider, the pantry and the individual

### **FOR COMMERCIAL FOOD VENDORS:**

- Clarify and communicate logistics of food access to support food distributor to effectively distribute 'right amount' at 'right time';

# Food Access Use Case

## THE DATA

Data type	Source
Food pantry location, operating hours, usage patterns by household	MOFB*; HandsOn
Additional services provided by food pantries	HandsOn
Household location for those served by food pantries	MOFB*
Food insecure neighborhoods	USDA
Poverty guidelines for eligibility to food pantries	USDA
Transportation data by mode of transportation	COTA
Health data on disease rates, unhealthy behaviours and prevention actions	CDC
Licensed food resources	CPH
SNAP eligibility Criteria	USDA
High-priority neighborhoods based on infant mortality rate	CPH

\*Tentative

MOFB	Mid-Ohio Food Bank
HandsOn	HandsOn Central Ohio
USDA	US Department of Agriculture
CDC	Centers for Disease Control
CPH	Columbus Public Health

# Bridge Height Intelligence

Richard Jones



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# Rest Area Parking Availability

Richard Jones



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# Accessible Transit For All

Katie White, Harvey Miller,  
Nate Rogers, Marisa Sheldon

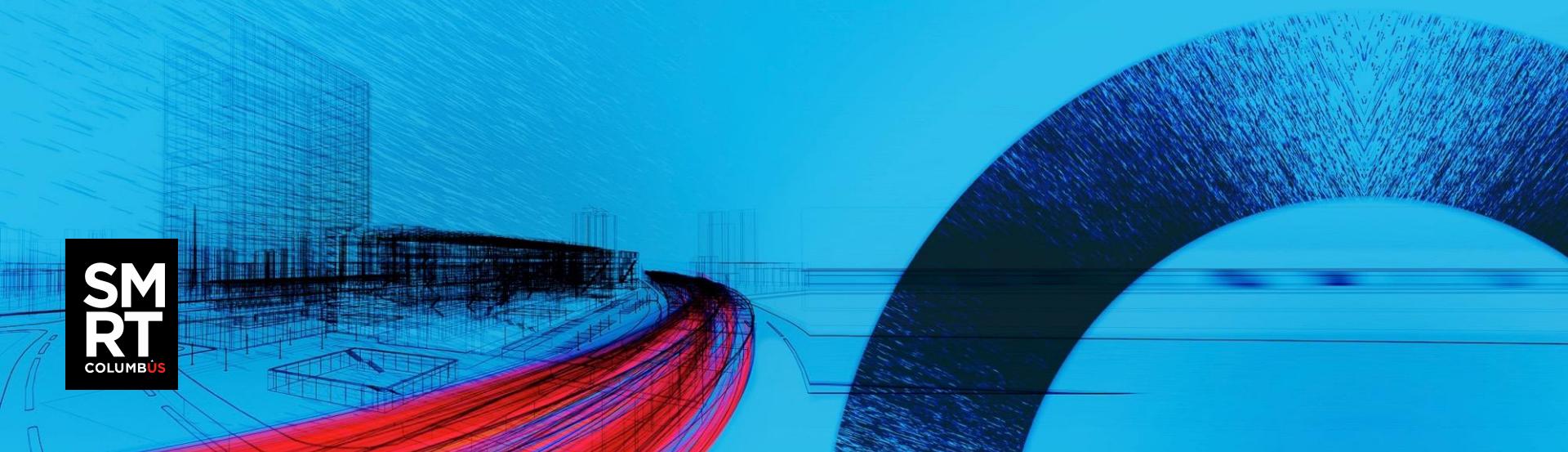


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# ACCESSIBLE TRANSIT FOR ALL

- Context
- Problem statement
- Opportunity!
- What success looks like



# CONTEXT: OUR PARTNERS



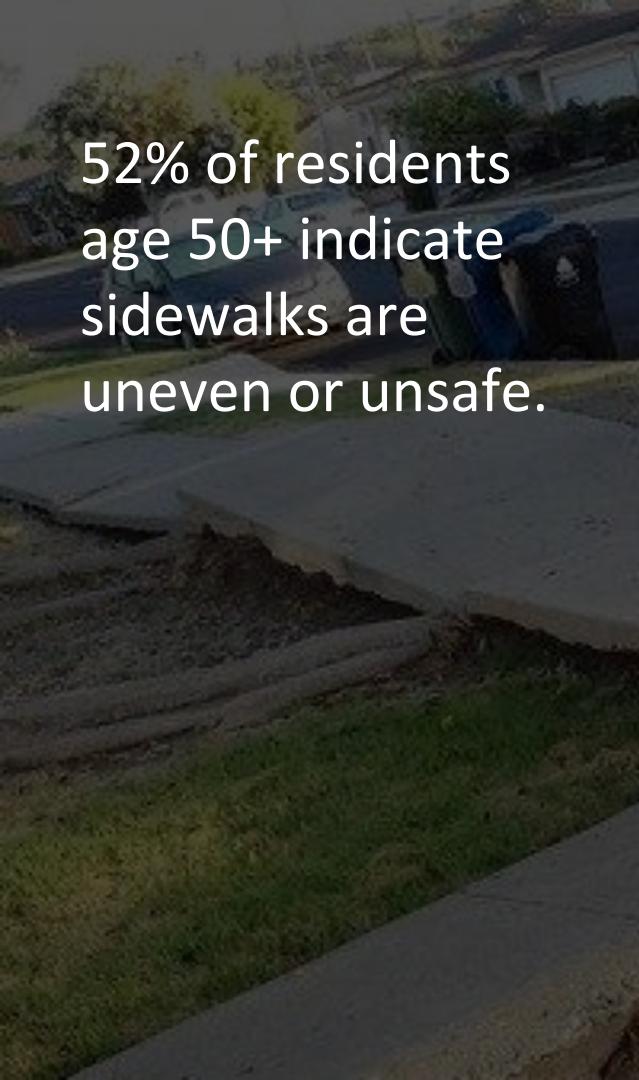
A medium shot of an elderly woman with short white hair and glasses, laughing heartily. She is wearing a light yellow t-shirt with a small "Columbia" logo on the left chest. She is seated in a black office chair at a wooden table. In the background, there's a window with white blinds, a shelf with various items, and a dark wooden chair.

# CONTEXT: MEET KAREN



# THEY SEE ME ROLLIN...





52% of residents  
age 50+ indicate  
sidewalks are  
uneven or unsafe.



# OH, SNAP.

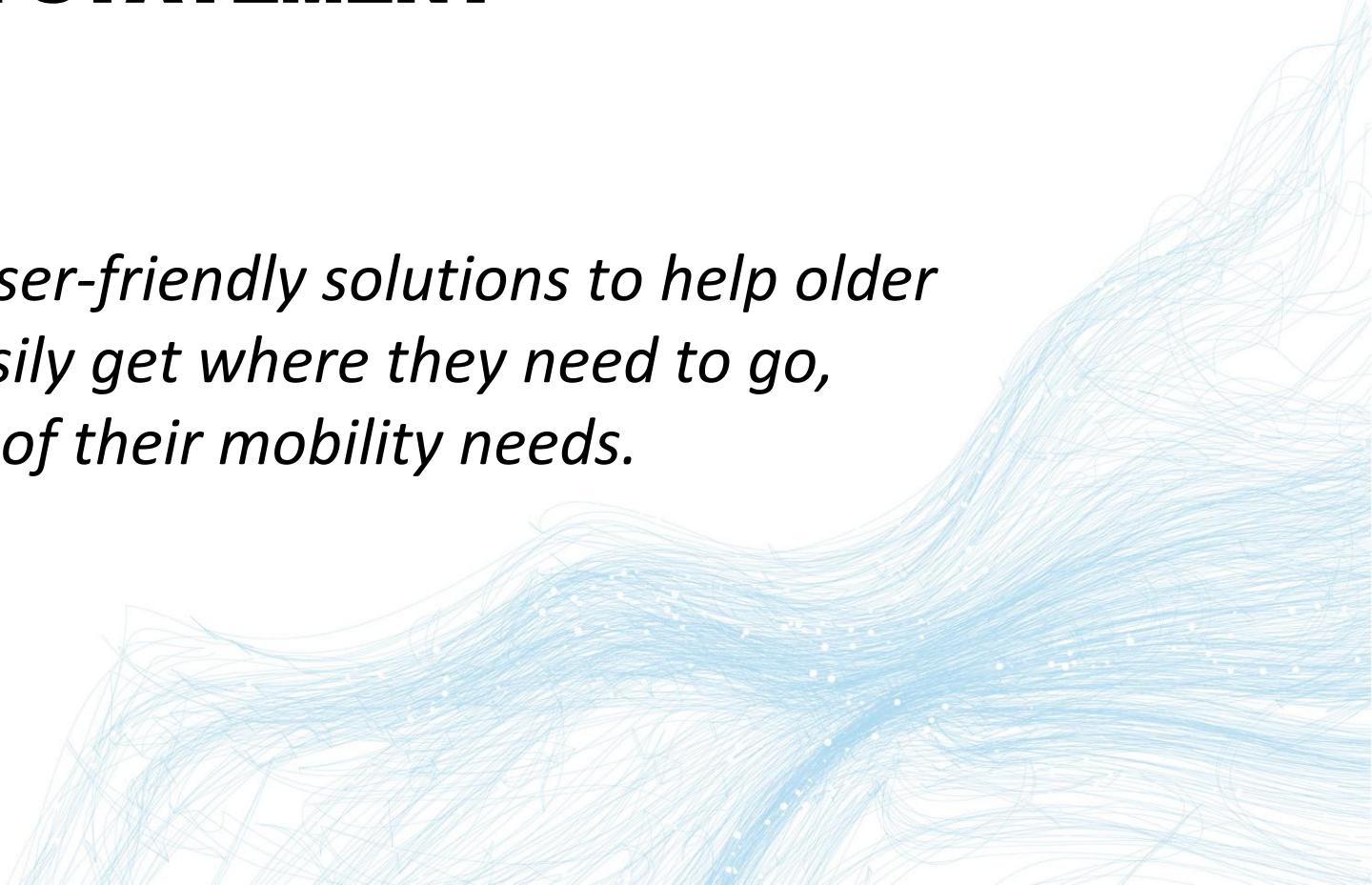
- 37% of adults over 50 have difficulty walking longer distances
- 34% do not feel safe walking
- 40% say sidewalks are not present in the areas they wish to walk

# DOUBLE SNAP.

- Existing transit tools inadequate
- Accessibility of destinations is unclear
- Insights, data, and resources are available, but not easily accessible

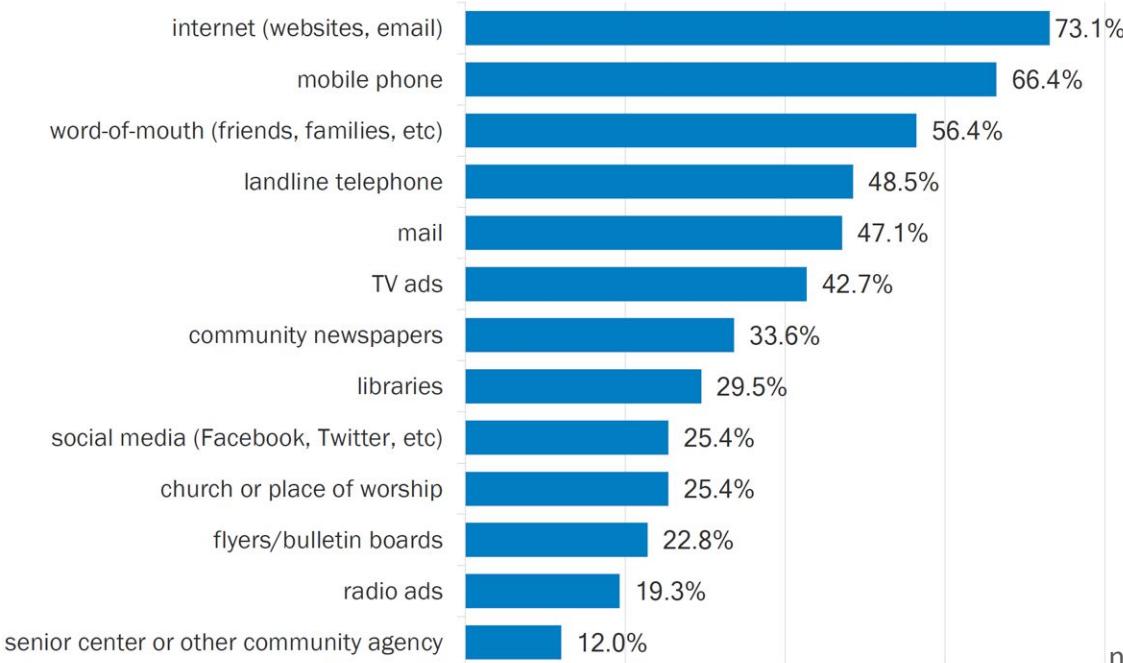
# PROBLEM STATEMENT

*Innovate user-friendly solutions to help older citizens easily get where they need to go, regardless of their mobility needs.*



# OPPORTUNITY!

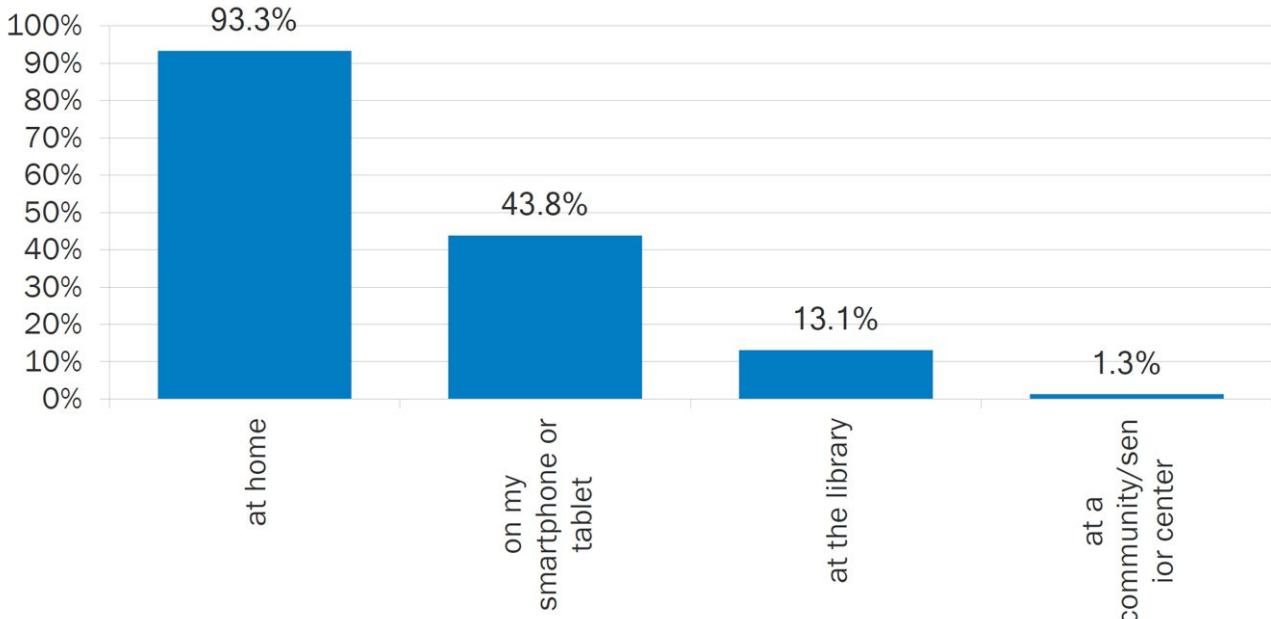
*What do you use to identify and access community services? (select all that apply)*



n=342

# OPPORTUNITY!

*Where do you use the internet?*



# OPPORTUNITY!

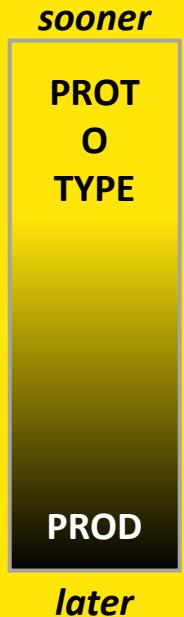
## DATA AT YOUR DISPOSAL TODAY

- Geographic density and Vulnerability of 55+ population
- COTA current transit schedules, routes, bus stops and amenities
- COTA 1-minute refresh of GPS data (archived)
- Sidewalk data
- Protected bike lanes and trails
- Healthcare services (location, service, scheduling, accessibility)
- Food services (location, services, scheduling, accessibility)
- Shopping destinations (location, services, accessibility)

...FEEL FREE TO MOCK UP ADDITIONAL DATA TO POWER YOUR SOLUTION

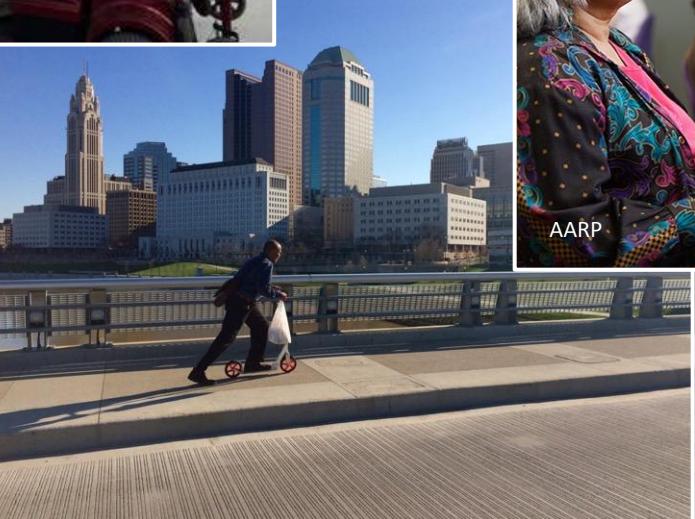
# WHAT (EVENTUAL) SUCCESS LOOKS LIKE...

- *Reflect empathy with the end user*
- *Connect relevant sources of data*
- *Allow users to tailor the tool to their mobility ability*
- *Route users to mobility-ability-appropriate transit*
- *Easy-to-use interface accessible via web, mobile app, phone*
- *Allow users to see/input accessibility reviews for destinations*
- *Meet 508 accessibility standards, pass 55+ usability testing*
- *Function on iOS and Android*



**...HACK AWAY AND HAVE FUN!**

# WHAT SUCCESS LOOKS LIKE



# next: pitches!

but first...



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# bio break



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# Pitching Process

- 1.** get in line  
to pitch
  
- 2.** 60 sec pitch  
on stage
  
- 3.** tell the organizer  
the name of your idea  
**super important!**

# FAQ

Q: Can I pitch something I've already started on?

A: Yes, but it will be exempt from judging. And...

---

Q: Can I pitch two ideas?

A: No, pick your favorite.

---

Q: What if my idea isn't selected?

A: That's ok! Join another team.

---

Q: Can I still work on my idea if it's not selected?

A: Yes, ONLY IF you have more than two other people on the team.

---

Q: Can I use any pitch props, slides, etc when pitching?

A: Props are ok, but slides are not. Remember it's short!

---

# anatomy of a pitch



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**hi, I'm [name]!**  
**the problem I want solve is [problem].**  
**my solution is [solution].**  
**to do this, we'll need [team].**  
**let's rock this weekend!**

# let's do this!



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# Don't Leave Without

**picking a work area**  
for the weekend

**defining a scope**  
brainstorm  
top 3 priorities  
assign roles

**making a sign with**  
team name,  
number  
members  
problem

# Venue Logistics

**Tomorrow**

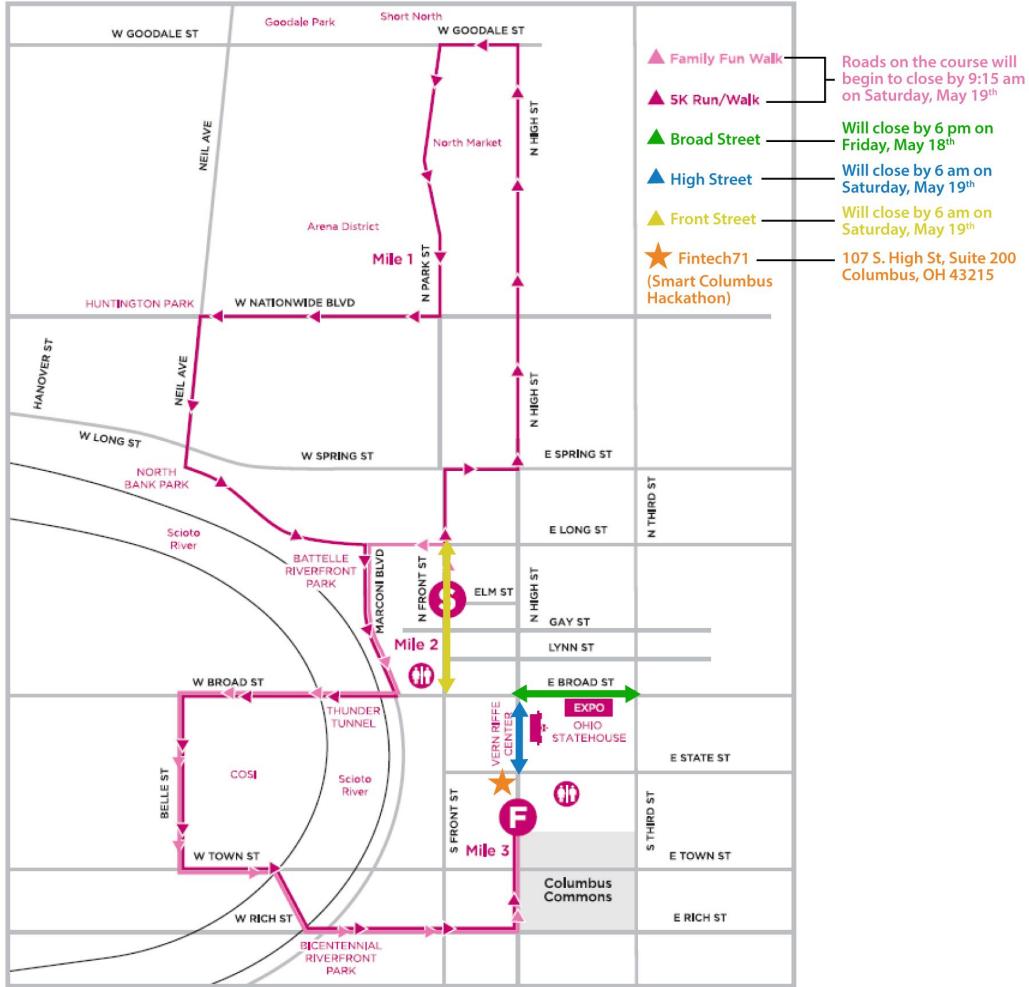
We start at 9am.  
Workshops at 9:30am.

**Tonight**

We must leave by 11pm.

# Course Map for Komen Columbus Race for the Cure®

May 19, 2018



# select your teammates!



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