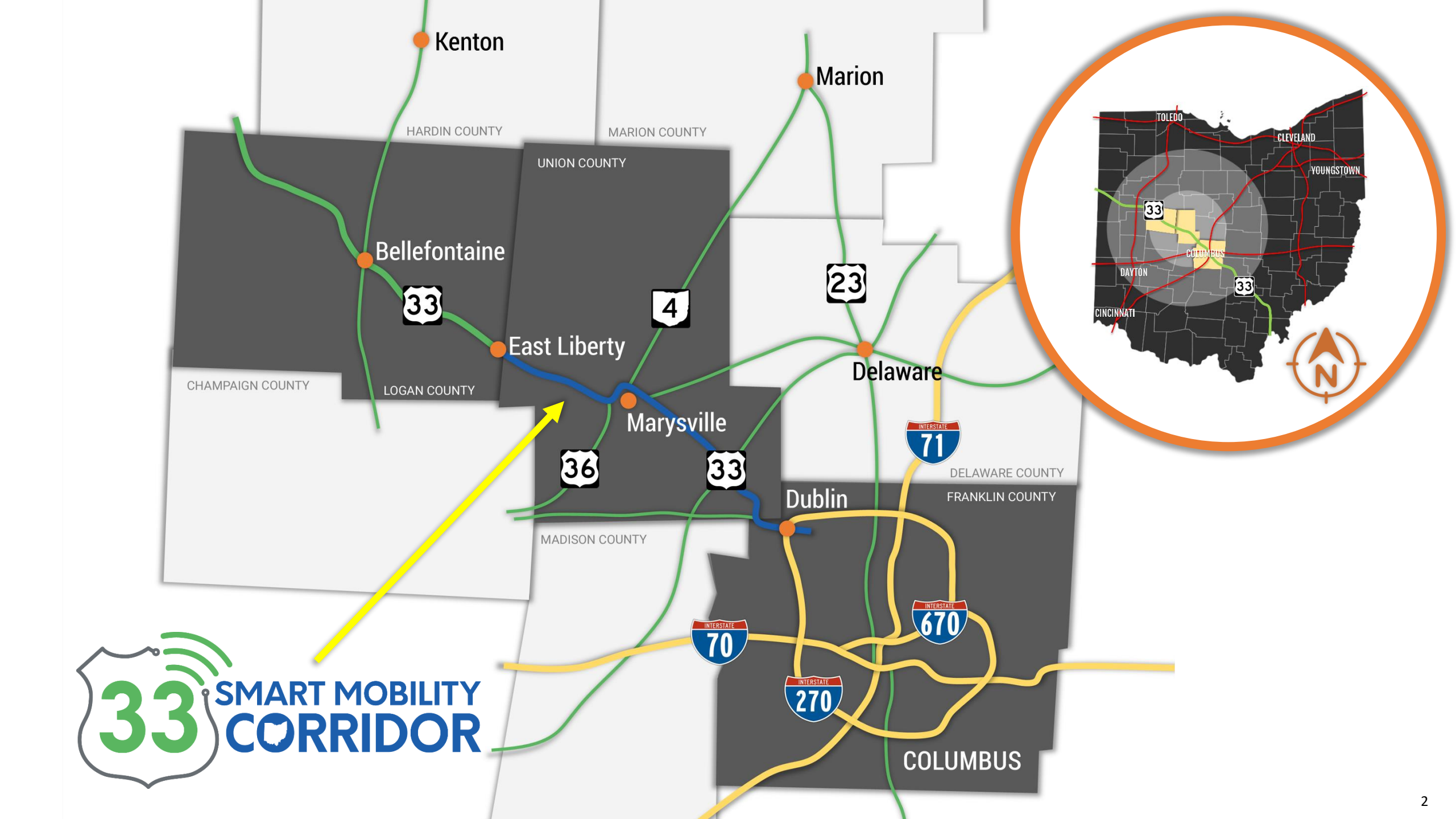
33 SMART MOBILITY CORRIDOR

ITS Wisconsin Transportation Conference

October 23, 2018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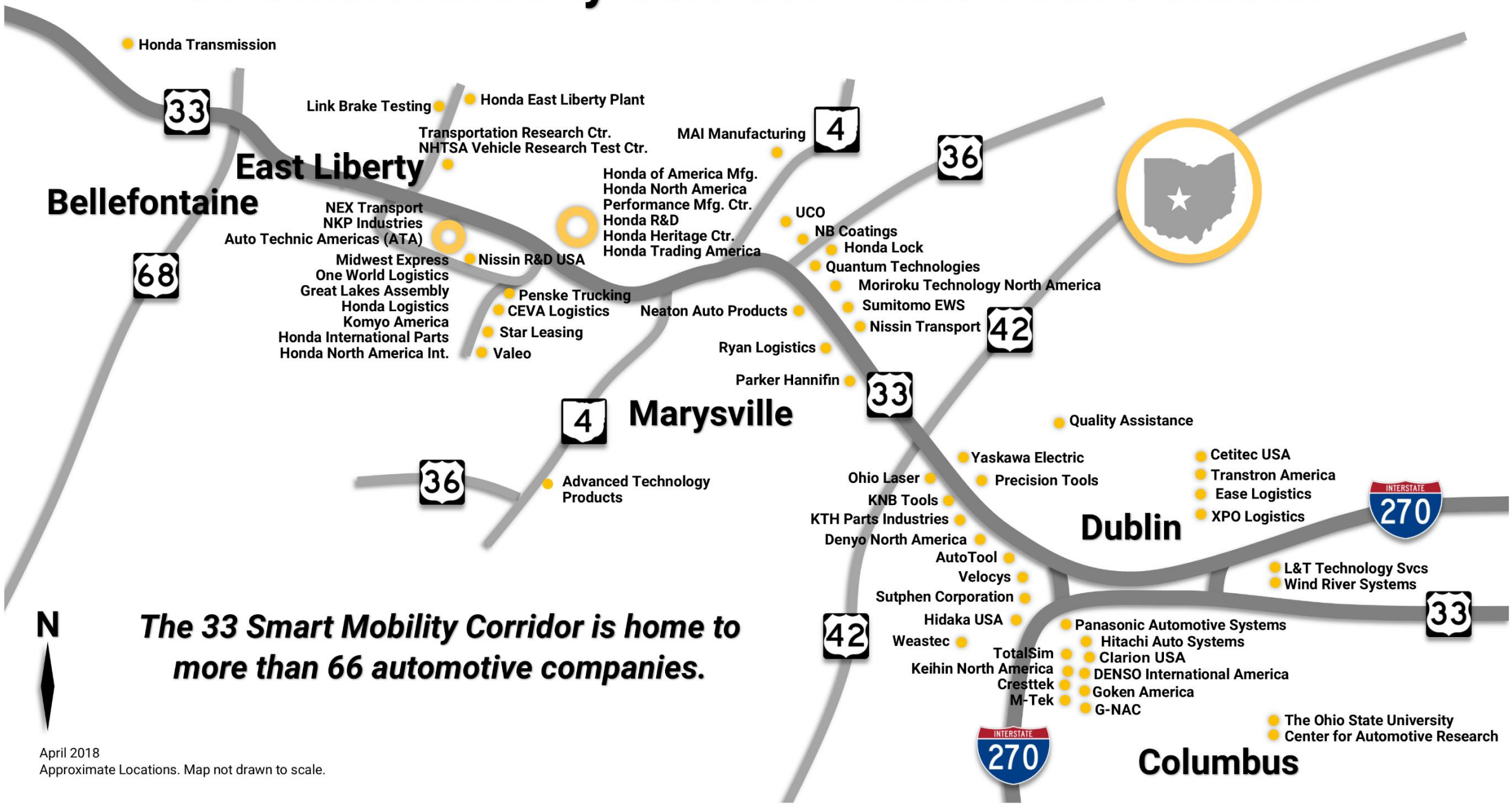
SMART MOBILITY
CORRIDOR

33 Smart Mobility Corridor - Automotive Cluster

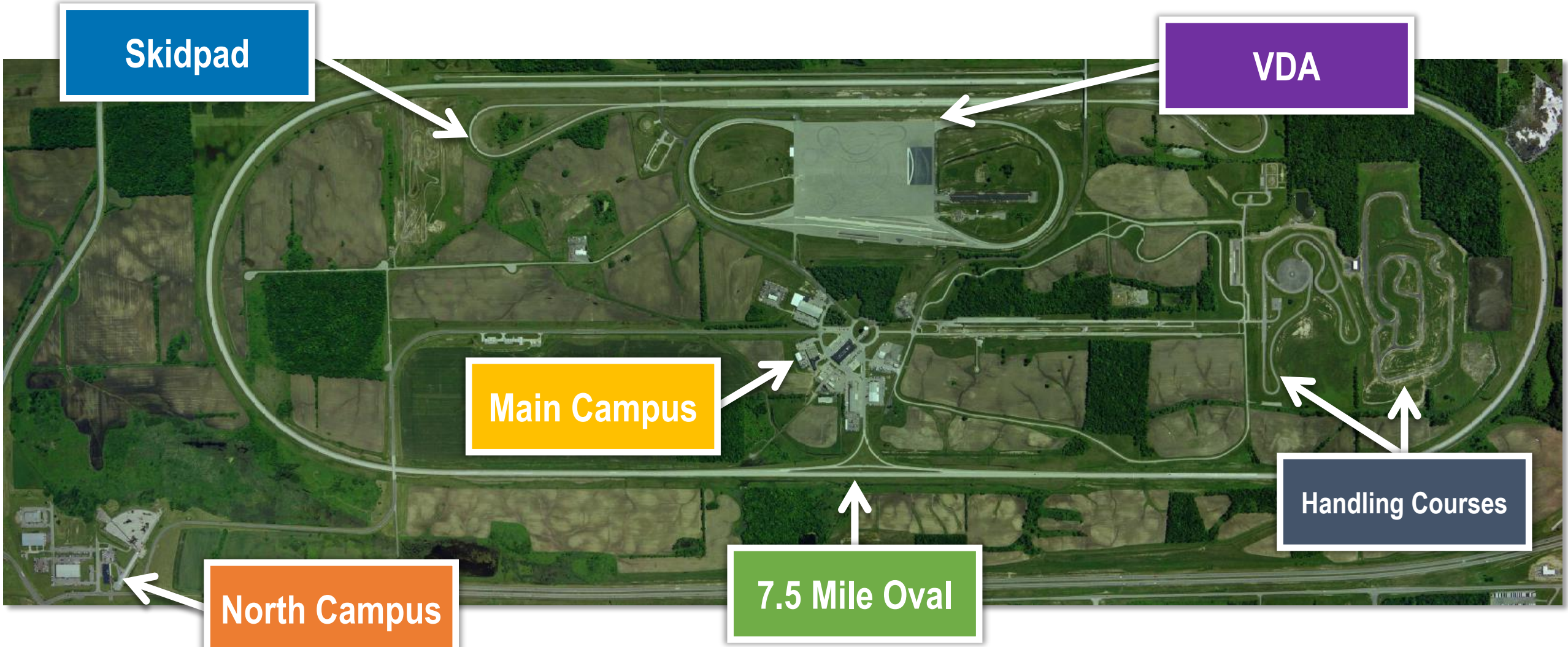


The 33 Smart Mobility Corridor is home to more than 66 automotive companies.

April 2018
Approximate Locations. Map not drawn to scale.

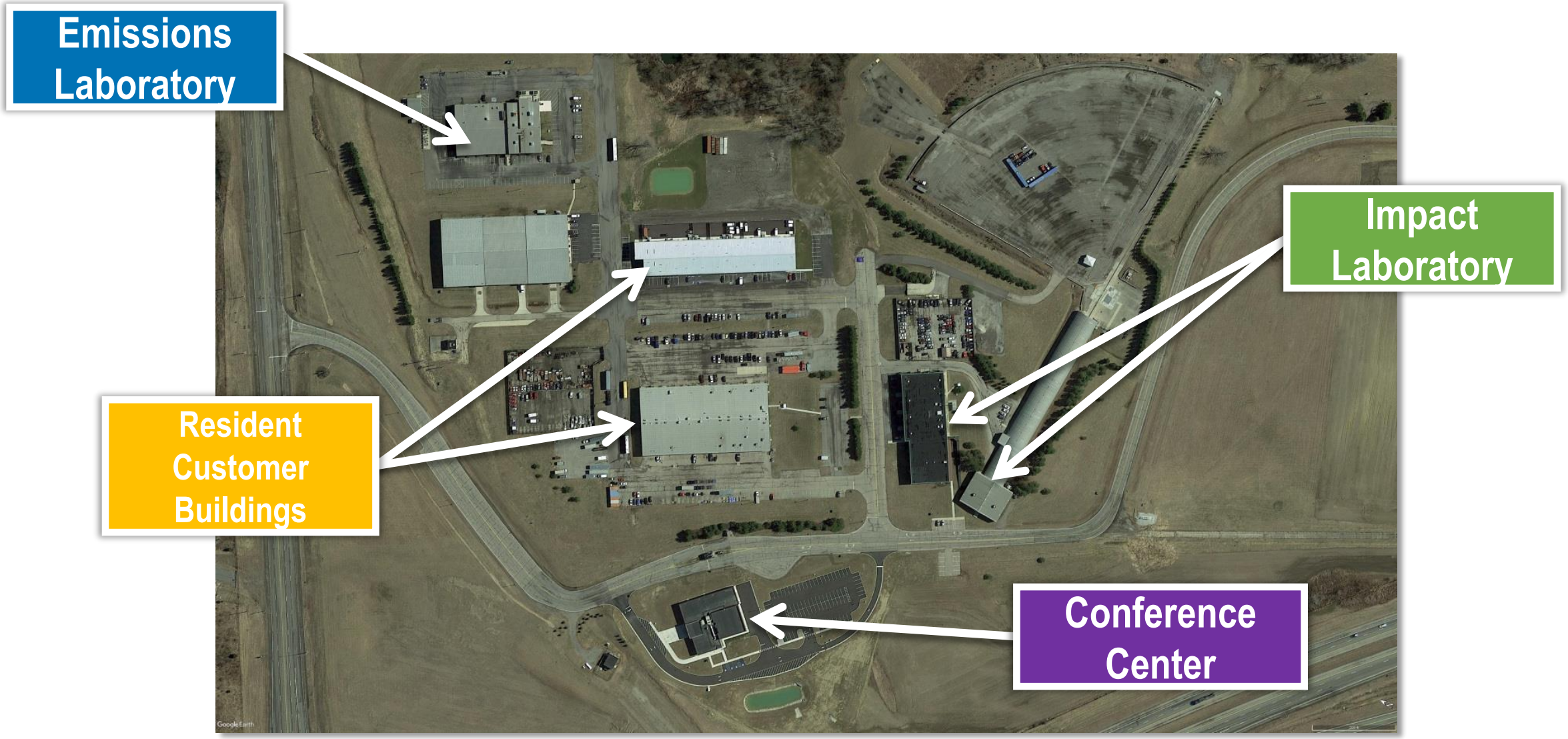
Transportation Research Center Inc.

FACILITY HIGHLIGHTS



Transportation Research Center Inc.

NORTH CAMPUS HIGHLIGHTS



CORRIDOR PROJECT EVOLUTION

2014-15

- Collaborative Group Formed to Explore Development Issues along US-33
- Collaborative Group Prioritizes Fiber Connectivity along US-33

2016

- Fiber Strategy Consultant
- OSU Mobility Concept
- Smart Project Introduced
- ODOT Commits up to $15 M for Fiber Construction
- NW 33 COG Formed
- USDOT Awards $5.9 M Grant

2017

- Fiber Installation Completed along US-33 (ODOT)
- Ohio Announces $45 M for TRC Expansion

33 SMART MOBILITY CORRIDOR

PROJECT GOALS

Public Safety

* Improve Congestion, Safety, and Access to Employment

Smart Infrastructure

* Installation of Smart Mobility Infrastructure and Systems Management
* Data Collection & Commercialization

AV/CV Testing

* AV/CV Testing
* Contained Testing at TRC
* On-road Testing on US-33
* Truck Platooning
* Urban Testing
* UAS Testing

Improve Connectivity

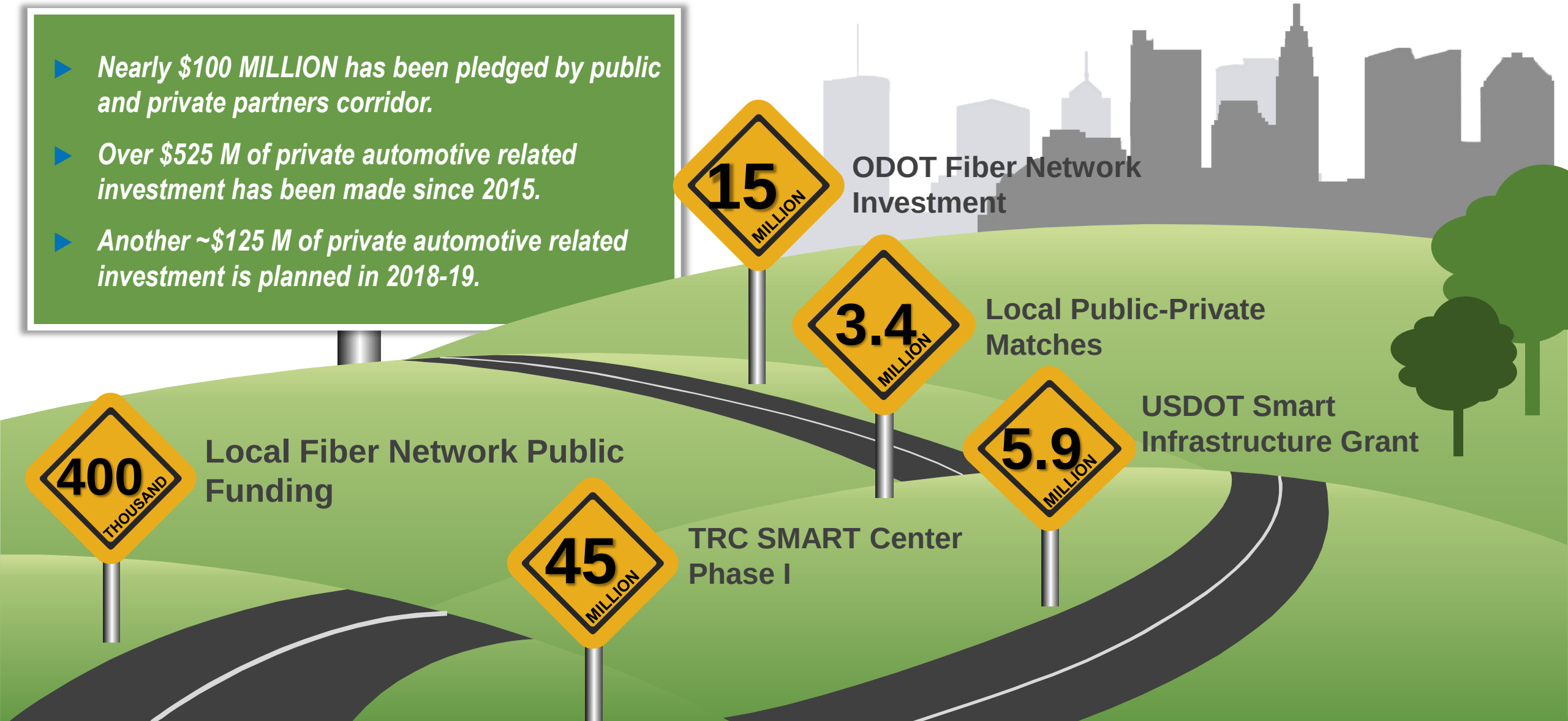
* Installation of Fiber along US-33
* Direct Connectivity to Educational Systems (OAR)
* Public Access

Economic Development

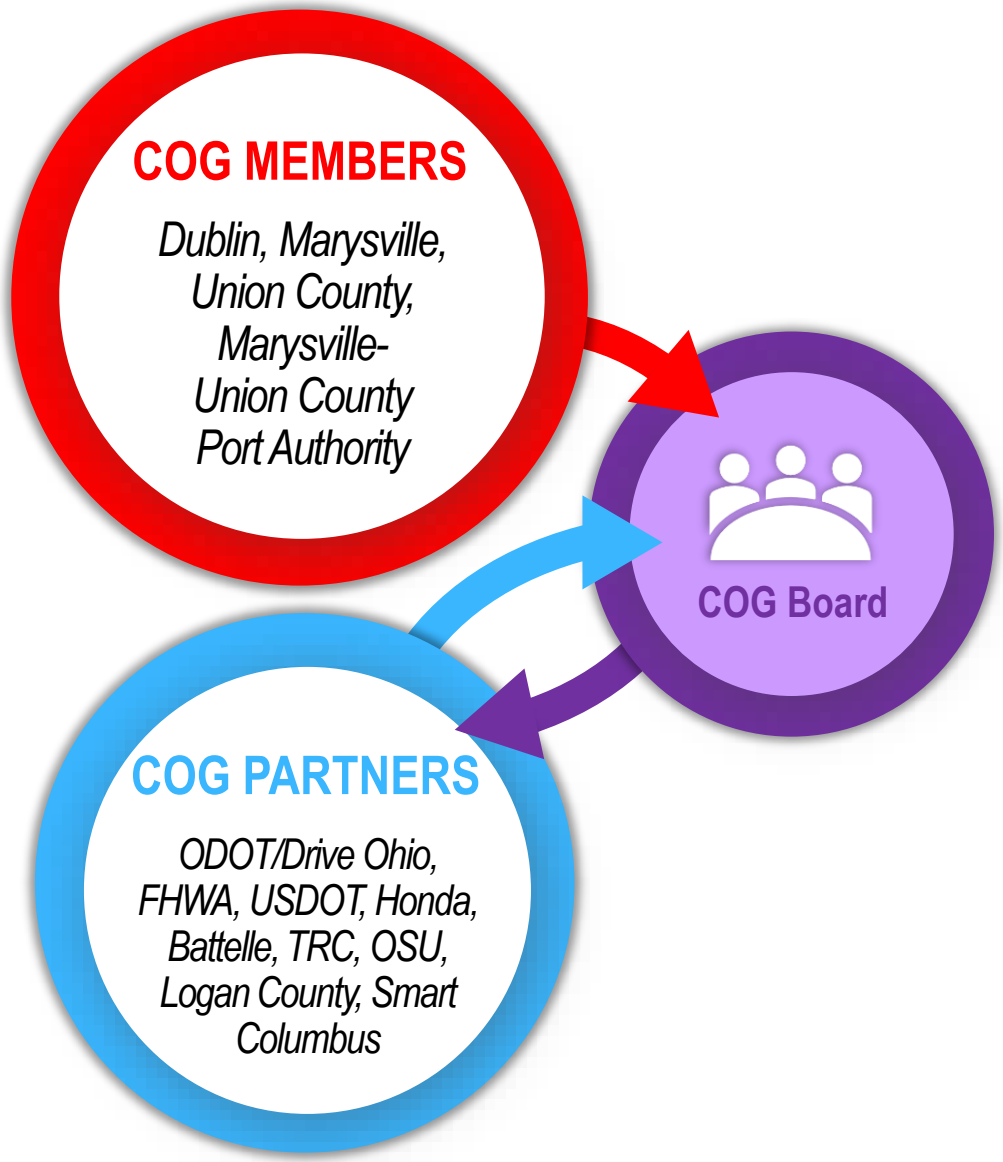
* Investment in Emerging Technologies
* Industry Grows to $2+ Trillion Annually by 2025
* Expansion of TRC and Automotive Assets
* Attraction & Retention of Business
* Global Partnerships

33 SMART MOBILITY CORRIDOR INVESTMENTS

- *Nearly $100 MILLION has been pledged by public and private partners corridor.*
- *Over $525 M of private automotive related investment has been made since 2015.*
- *Another ~$125 M of private automotive related investment is planned in 2018-19.*



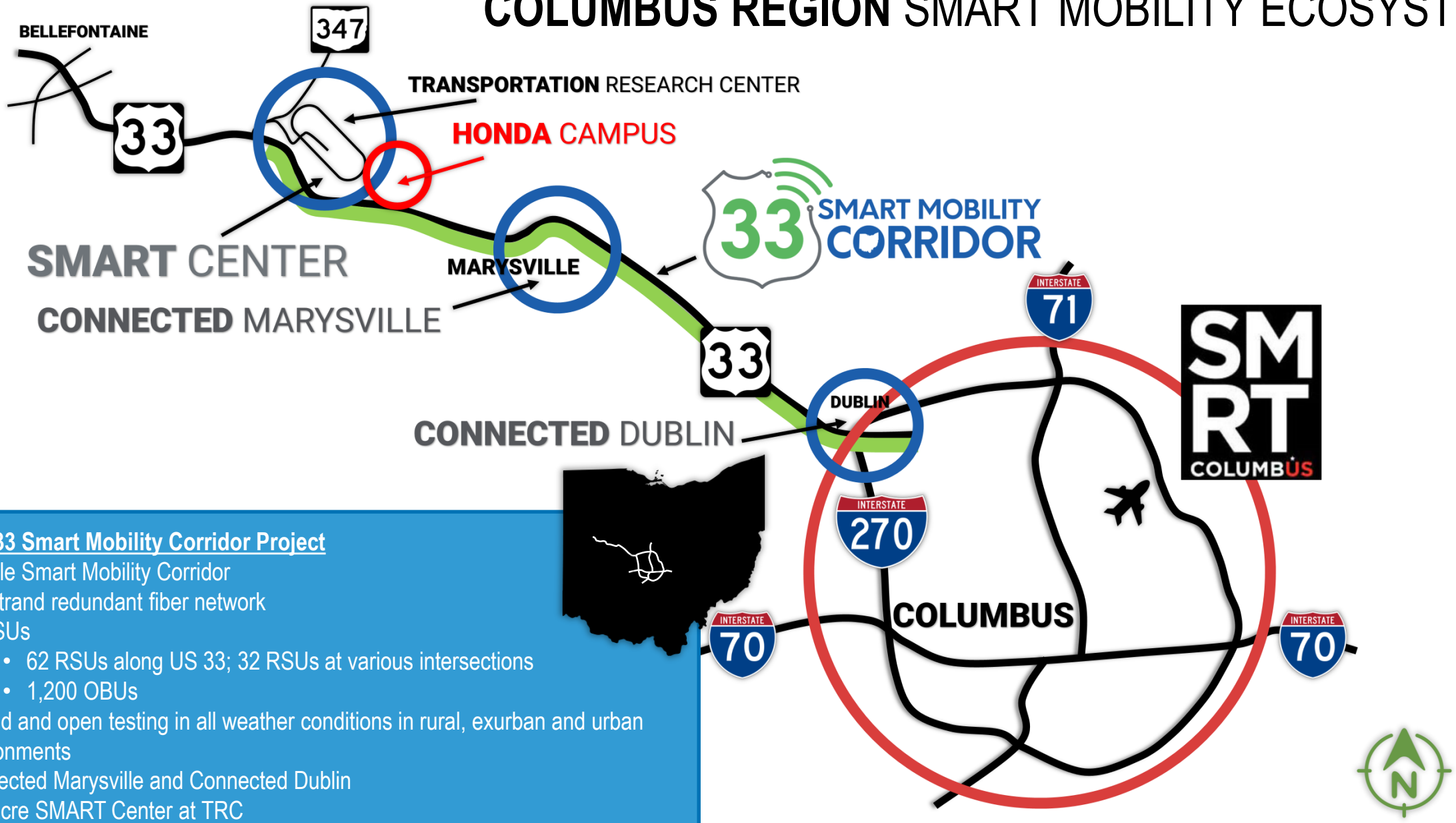
NW 33 COG STRUCTURE



COG COMMITTEES

- Executive Committee
- Infrastructure Working Group
- Vehicle Working Group
- Smart Network Working Group
- Engagement Working Group
- Finance Working Group

COLUMBUS REGION SMART MOBILITY ECOSYSTEM



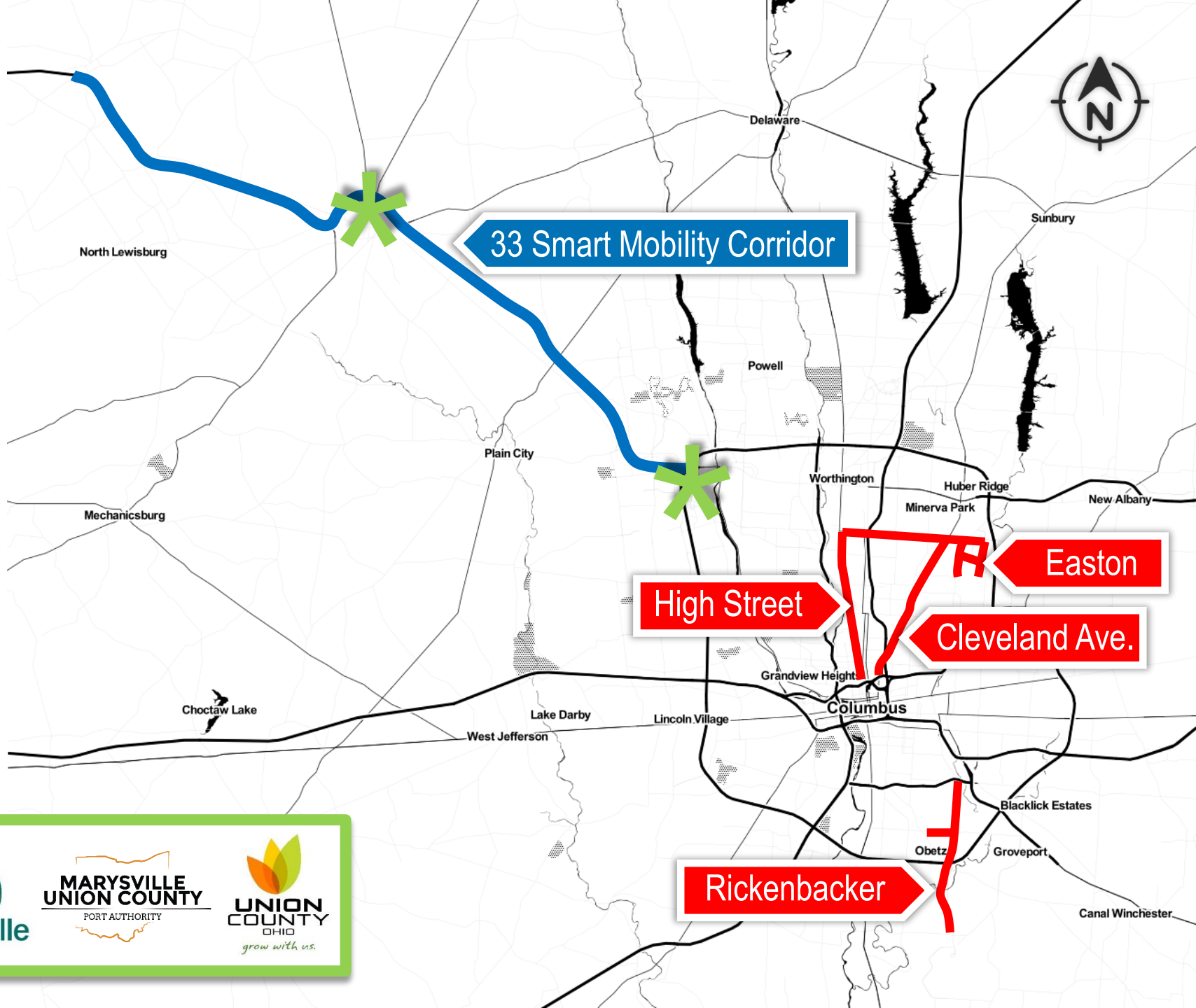
Ohio's 33 Smart Mobility Corridor Project

- 35-mile Smart Mobility Corridor
- 432 strand redundant fiber network
- 94 RSUs
  - 62 RSUs along US 33; 32 RSUs at various intersections
  - 1,200 OBUs
- Closed and open testing in all weather conditions in rural, exurban and urban environments
- Connected Marysville and Connected Dublin
- 540-acre SMART Center at TRC
- Smart Belt Coalition effort to connect OH, PA, and MI

REGIONAL CONNECTED VEHICLE ENVIRONMENT (CVE)

- **179 Intersections:**
  - 147 City of Columbus
  - 27 City of Marysville
  - 5 City of Dublin

- **3,000 cars, trucks, and buses** connected in the Columbus Region by 2020:
  - 1,800 City of Columbus
  - 1,200 Marysville/US-33



DriveOhio The Future of Smart Mobility · SMART COLUMBUS · City of Dublin OHIO, USA · CITY OF marysville · MARYSVILLE UNION COUNTY PORT AUTHORITY · UNION COUNTY OHIO grow with us.

CONNECTED DUBLIN

Avery-Muirfield Corridor

- ATCMTD Grant
- Traffic Signals outfitted with RSUs

SR 161/Riverside Drive Roundabout

- Multilane roundabout within 2 signalized corridors
- CV research and operations study
- Collect data of circulating vehicles in roundabout to inform approaching vehicle decision-making

Bridge Park East Smart Parking

- New parking inventory
- Increasing demand
- NO existing meter infrastructure
- Interesting opportunity
  - No capital investment
  - No clutter
  - Ample off-street parking alternatives

Avery-Muirfield Corridor Connected Signals

OH-161/Riverside Dr. Connected Roundabout & Signals

Bridge Park East - Smart Parking

CONNECTED MARYSVILLE

- 27 Traffic Signals outfitted with RSUs
- 1,200 vehicles outfitted with OBUs
- Online repository for collected data from vehicles
- Future investments:
  - Signage
  - Striping
  - Street Lighting

Smaller Town, Lower Traffic Volumes

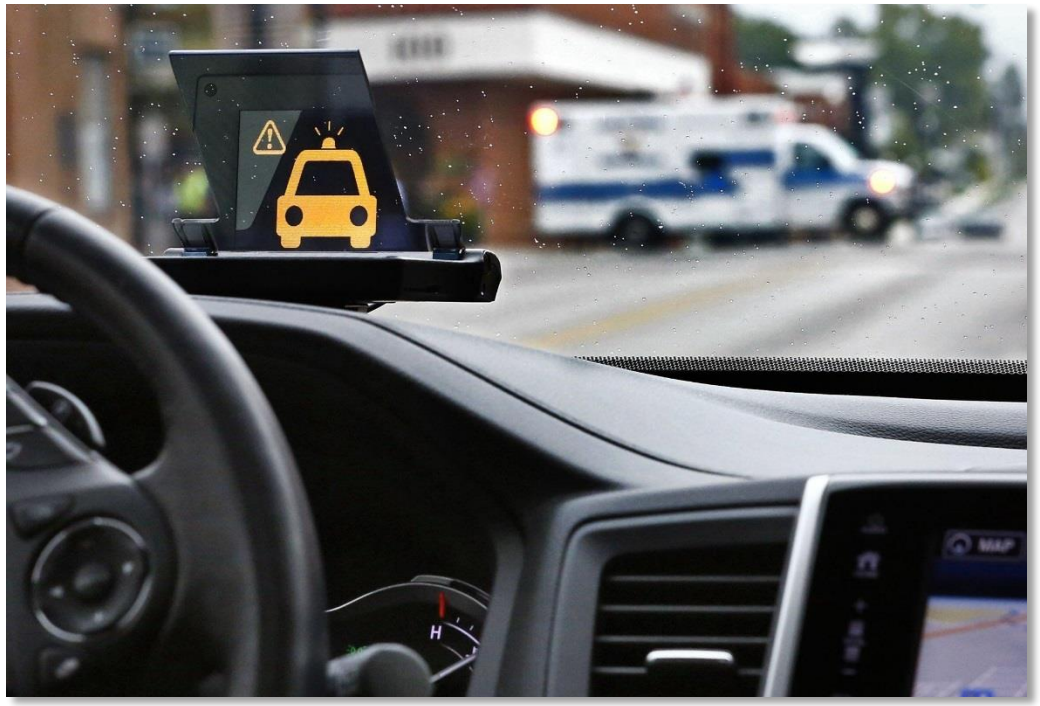
- 10% Penetration Rate with 1,200 vehicles.
- Connected vehicles won't get lost in the crowd.

Home of Honda's largest manufacturing and R&D facilities in North America

- End user feedback allows for "right size" design

MARYSVILLE'S SMART INTERSECTION

On October 4th, Governor Kasich joined Honda officials in Marysville to unveil a "smart intersection" at Main and Fifth Streets in Uptown Marysville. Cameras and sensors can warn drivers about oncoming hazards, such as approaching emergency vehicles, red light runners, and pedestrians.



The technology in which the intersection can communicate with drivers is the first step in perfecting driverless cars.
Fully autonomous vehicles available for consumer purchase are anticipated by 2025.

UNMANNED AIRCRAFT SYSTEMS TESTING

UAS Testing Program

- Three year partnership DriveOhio's UAS Center and The Ohio State University College of Engineering.
- Monitor traffic and roadway conditions from the air along the corridor in conjunction with the state's current fixed-location traffic camera system.
- Will also use sensors and communication devices to ensure the unmanned aircraft will not collide with each other or with manned aircraft.

PLANNED CVE APPLICATIONS

Pedestrian Crosswalk Warning

Red Light Violation Warning

Road Weather Sensor System

Ramp Wrong Way Warning

Curve Speed Warning at Interchange Ramps

Signal Phasing & Timing

Reduce Speed Zone Warning/Lane Closure

Railroad (potential)

WHY ARE WE DOING THIS?

Nationwide, total of **37,461** people died in motor vehicle crashes in 2016. These deaths occurred in **34,439** crashes involving **52,231** motor vehicles. This was a **6 percent increase in deaths** compared with 2015 and the highest number of traffic deaths since 2007.

94% of serious crashes are due to human error.

ERAS OF VEHICLE SAFETY IMPROVEMENT

1950 – 2000

- Safety/Convenience Features
- Cruise Control
- Seat Belts
- Antilock Brakes

2000 – 2010

- Advanced Safety Features
- Electronic Stability Control
- Blind Spot Detection
- Forward Collision Warning
- Lane Departure Warning

2010 – 2016

- Advanced Driver Assistance Features
- Rearview Video Systems
- Automatic Emergency Braking
- Pedestrian Automatic Emerg. Braking
- Rear Automatic Emerg. Braking
- Rear Cross Traffic Alert
- Lane Centering Assist

HOW DO WE MAKE MOBILITY SAFER?

- ✓ V2V and V2I vehicle technology could address **80%** of the crash scenarios.
- ✓ V2I technology alone could reduce **26%** of all target crashes annually.
- ✓ Left Turn Assist (LTA) and Intersection Movement Assist (IMA) could prevent 592,000 crashes and **save 1,083 lives** per year.

FUTURE PROJECT TIMELINE

2018

- Phase II Fiber Installation along Industrial Parkway and Northwest Parkway for Redundant Loop
- System Engineering Completed
- TRC Begins Construction of SMART Center
- Corridor Named as Proving Ground for UAT
- DriveOhio Established by State of Ohio
- NW 33 COG Hires Project Manager
- Executive Order Establishes Statewide AV/CV Testing Protocol

2019

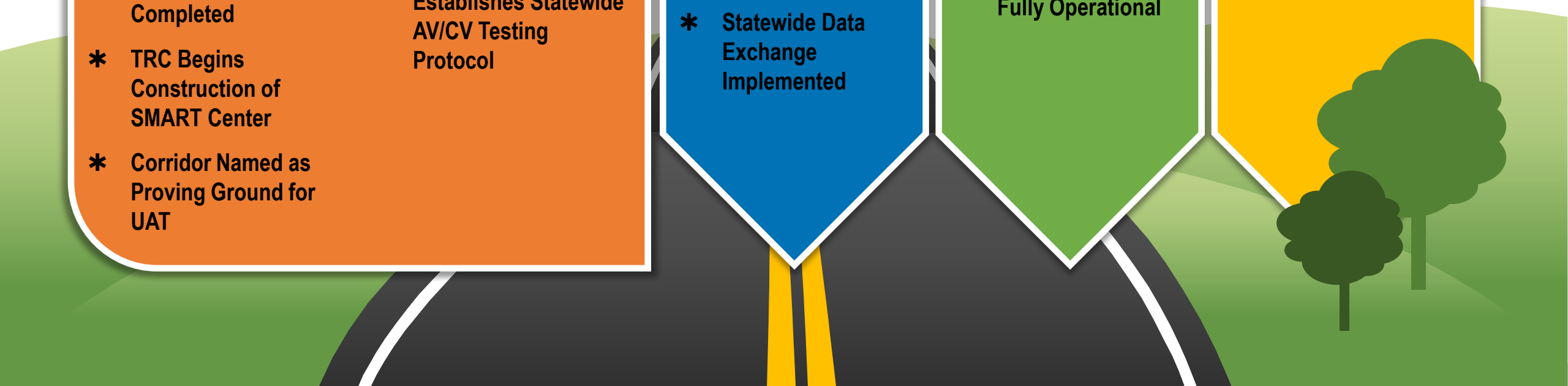
- DSRCs with RSUs are Installed
- OBUs Installed in Vehicles
- Statewide Data Exchange Implemented

2020

- 33 Smart Mobility Ecosystem Operational
- CV Application Fully Operational

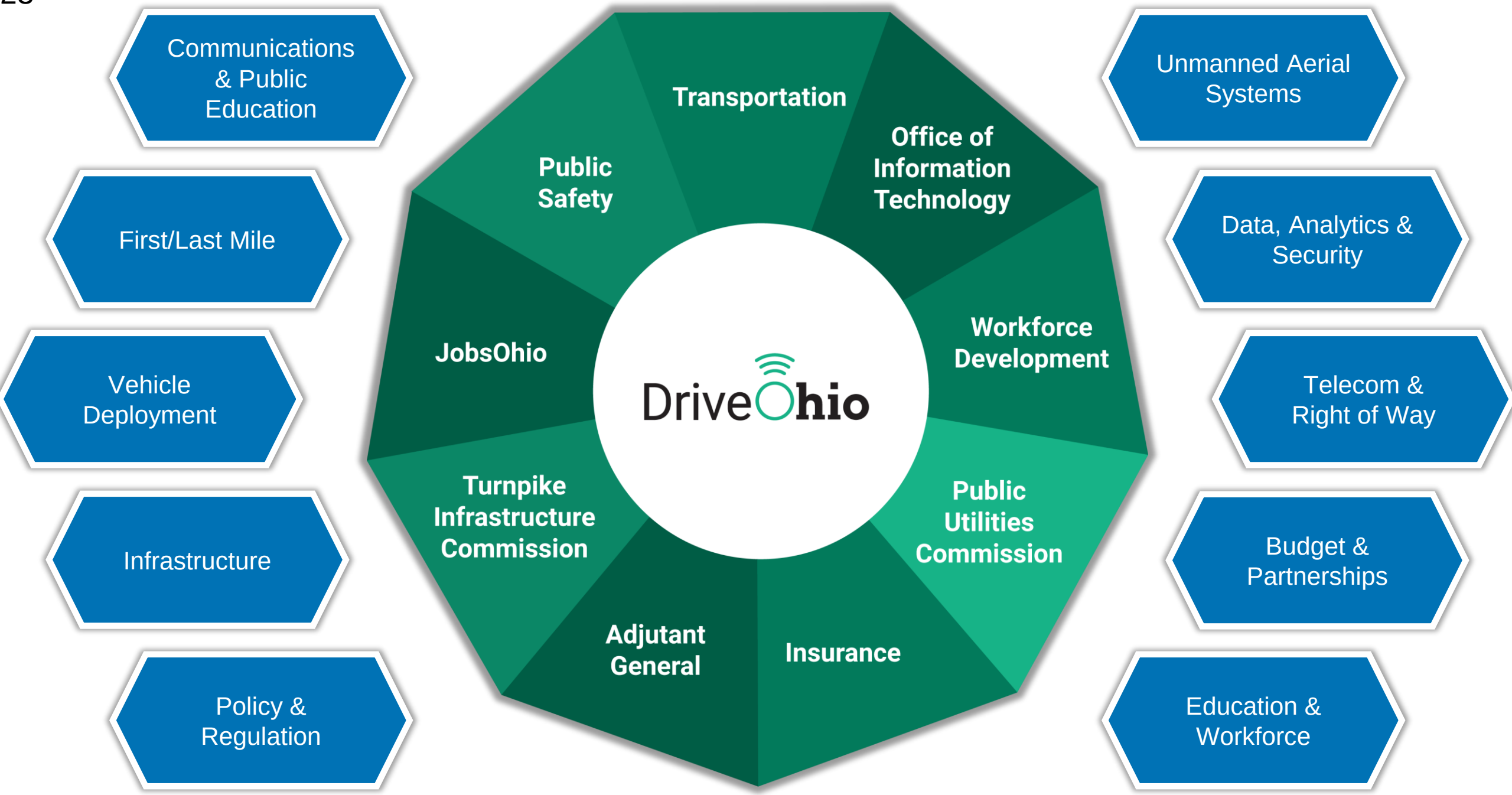
2021

- DSRCs are Required in all New Vehicles



DriveOhio

The Future of Smart Mobility


Communications & Public Education
First/Last Mile
Vehicle Deployment
Infrastructure
Policy & Regulation
Transportation
Office of Information Technology
Workforce Development
Public Utilities Commission
Insurance
Adjutant General
Turnpike Infrastructure Commission
JobsOhio
Public Safety
DriveOhio
Unmanned Aerial Systems
Data, Analytics & Security
Telecom & Right of Way
Budget & Partnerships
Education & Workforce

FOUR PILLARS

A Safer, more Mobile and Connected State

2018-2019 Statewide Projects

morpc

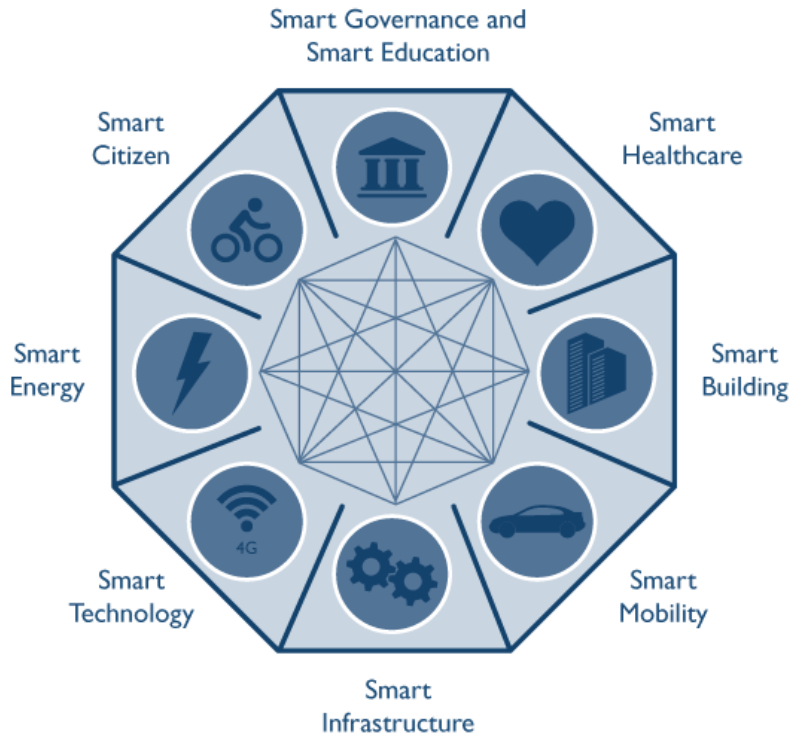
Mid-Ohio Regional Planning Commission

SMART REGION TASKFORCE

- Vision: Convene thought leaders within Central Ohio to develop a shared vision for what it means to be a Smart Region

- Questions we're seeking to answer
  - What is a "Smart Region?"
  - What are mutually beneficial "smart" policies that can guide investment decisions for our local communities?
  - What resources can MORPC provide to help?

- Structure
  - Duration: 18-24 months
  - Representation: 2/3 local governments, 1/3 technical experts
  - Membership appointed by MORPC Executive Director

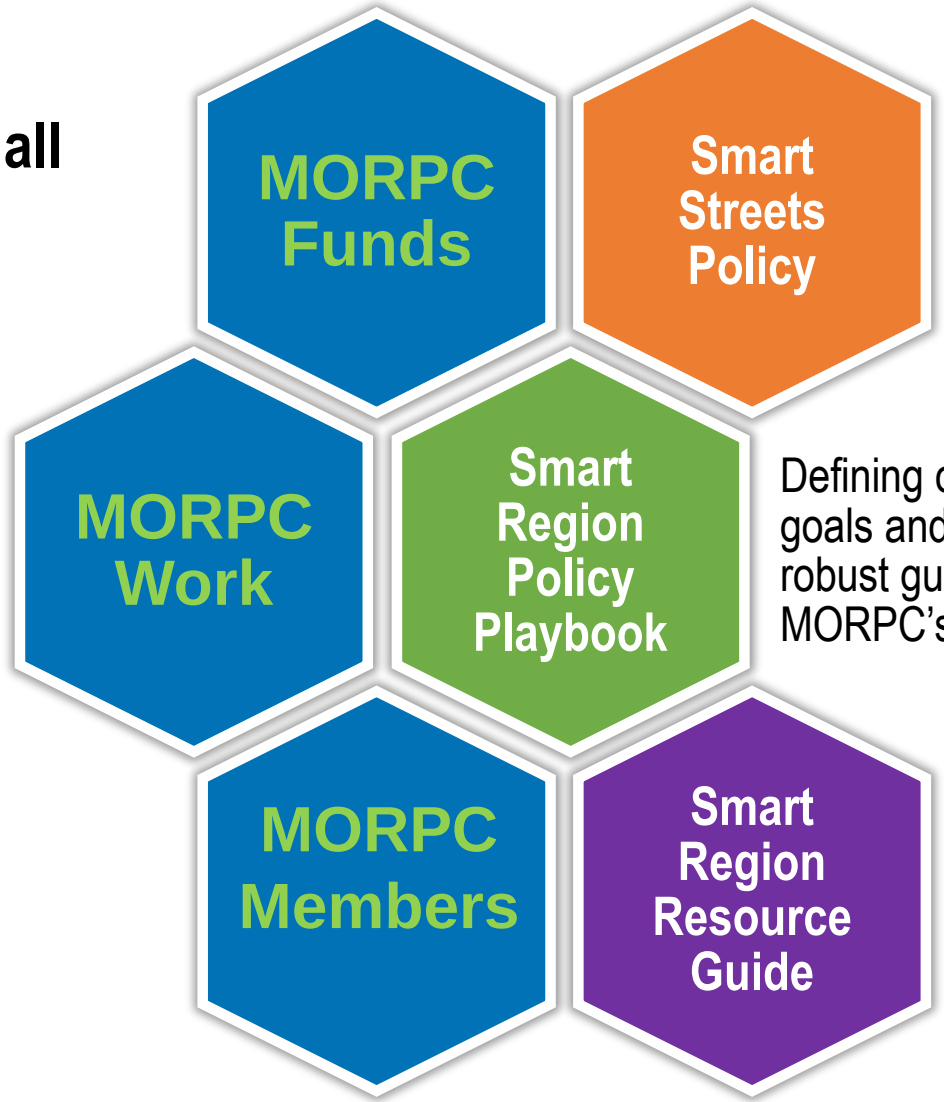


Proposed Purpose

Prepare and guide local governments on smart city investments.

SMART REGION TASKFORCE - DELIVERABLES

Intended to address all aspects of MORPC's work:



Helping guide investments with regional smart priorities

Defining our regional goals and serving as a robust guide for MORPC's work

Helping communities with best practices, policies & funding opportunities

THANK YOU / QUESTIONS?

33 SMART MOBILITY CORRIDOR

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NW 33 Innovation Corridor Council of Governments

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