

An aerial photograph of Ann Arbor, Michigan, taken at sunset. The sky is a mix of deep purple, blue, and orange. The city's buildings are silhouetted against the bright horizon, with some lights beginning to glow. The overall mood is serene and urban.

SPARK@nn arbor usa

**SMART CITIES: THE OS FOR
PROSPERITY AND INCLUSION**

Paul Krutko, FM HLM

President and Chief Executive Officer, Ann Arbor SPARK

Smart Cities Symposium @ WCC – April 6, 2018

Agenda

1

INNOVATION DISTRICTS

Why are they important? Strategies for creating an area of innovation.

2

ANN ARBOR SPARK: SUPPORTING INNOVATION AND ENTREPRENEURSHIP

The region, what we do, and how we do it

3

TESTING & VALIDATING NEW MOBILITY TECHNOLOGIES

The American Center for Mobility

4

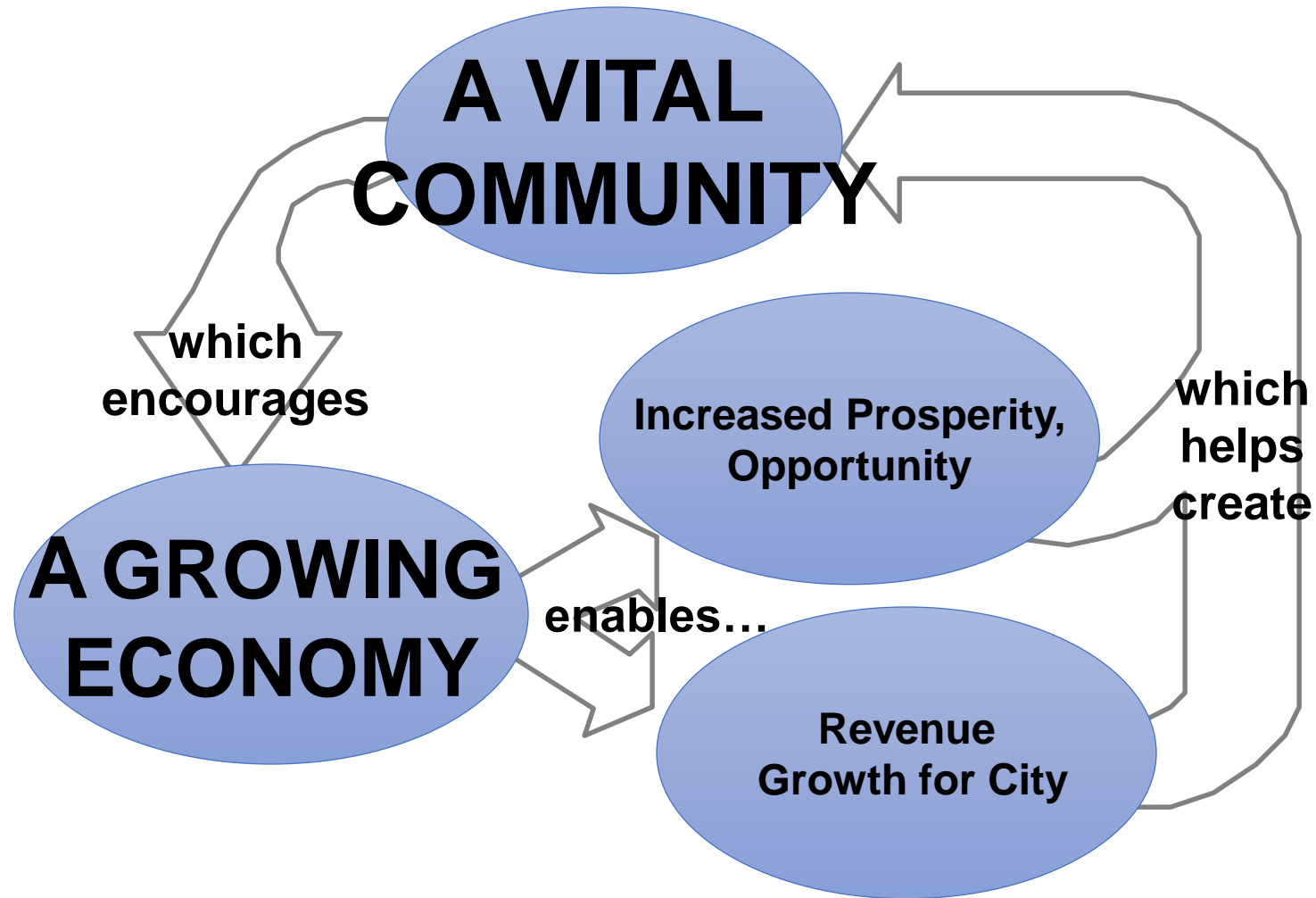
CITY AS A LIVING LAB

Open platforms for plug and play

Q&A



Vital Cycle of Success




Are Areas of Innovation a New Paradigm?

What is an “Area of Innovation”?

Can science and technology parks and areas of innovation create positive change in cities

.....helping to create **smart cities or smarter cities.....entrepreneurial cities?**

An aerial photograph of a city, likely San Diego, with a dense cluster of buildings in the foreground and a range of mountains in the background. The text is overlaid in the center of the image.

**The science park evolves to city
scale....**

Lesson Learned....

Innovation thrives where talent can meet and collaborate in an open environment....

City environments provide the stimulation and richness to attract talent....

Technology clusters can grow organically and with intention in concentrated areas of cities that is – areas of innovation

New conception of how to shape an economy and to create places based on social networking...

Barcelona

Berlin

London

Medellin

Montreal

Seoul

Stockholm

Toronto

.....and many cities throughout the United States



THE RISE OF INNOVATION DISTRICTS

A New Geography of Innovation in America



Brookings: Area of Innovation = Innovation District

Innovation District

In·no·va·tion
Dis·trict

Geographic area where anchor institutions and companies cluster and connect with small firms, start-ups, business incubators and accelerators.

Physically compact, transit-accessible, and technically wired, they offer mixed-use housing, office and retail.

INDUSTRIAL DISTRICT



RESEARCH PARK



INNOVATION DISTRICT



Direct and Indirect Job Generators

“For each new high-tech job in a metropolitan area, **five additional local jobs** are created outside of high tech in the long run.”

- Economist Enrico Moretti in *The New Geography of Jobs*

Some Basic Geographic Models with Variations

Urbanized Science Park

Outside of the city core where suburban parks are urbanizing



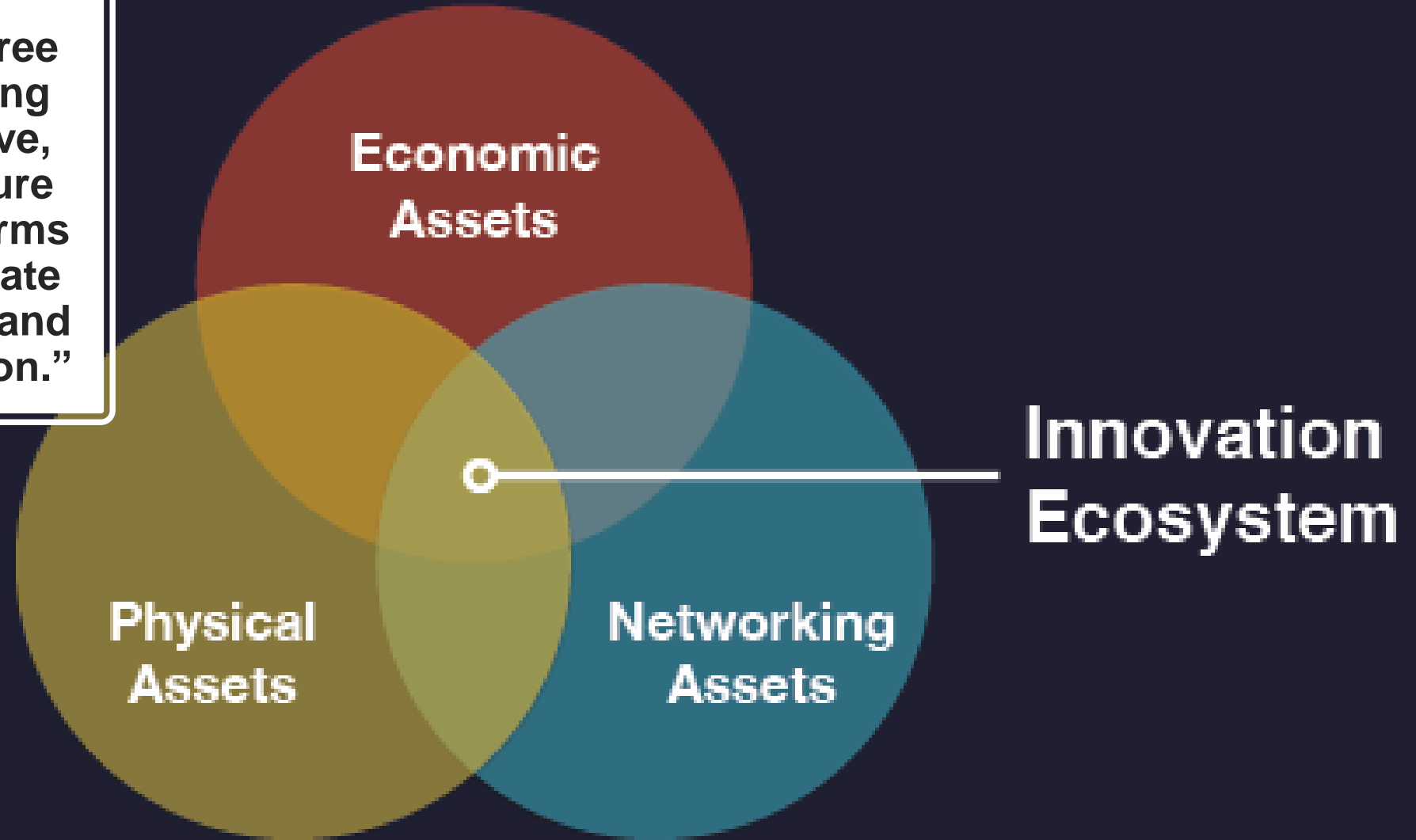
Anchor Plus

Anchor-driven in midtown/downtown areas

Re-imagined Urban Area

Within or near waterfronts or other old industrial areas

“Innovation Ecosystem – three assets combining with a supportive, risk taking culture where people, firms and place facilitate idea generation and commercialization.”



How to create and grow an area of innovation


- 1- Build a collaborative leadership network
- 2- Set a vision for growth
- 3- Pursue talent and technology
- 4- Promote inclusive growth
- 5- Enhance access to capital

An aerial photograph of Ann Arbor, Michigan, taken at sunset. The sky is a mix of deep purple, blue, and orange. The city's buildings are visible, with some lights starting to glow. The text "What is Ann Arbor SPARK?" is overlaid in the center in a white, bold, sans-serif font.

What is Ann Arbor SPARK?

The logo for SPARK@nn arbor usa is displayed in white text against a blue sky background. The word "SPARK" is in a bold, sans-serif font, with a yellow starburst graphic replacing the letter "A". The "@nn arbor usa" part is in a smaller, regular sans-serif font.

SPARK@nn arbor usa

The background of the slide is a scenic photograph of a lake at dawn or dusk. A wooden dock with several vertical posts extends from the left side into the water. The water is calm, reflecting the sky and the surrounding green trees on the far shore. A light mist hangs over the water's surface, creating a serene atmosphere.

“SPARK will advance the economy of the Ann Arbor region by establishing the area as a desired place for innovation, business expansion and growth, and for talented people to live and work. The Ann Arbor region will be recognized for our academic, business and community resources and our collaborative culture.”

**MISSION
STATEMENT**

ANN ARBOR SPARK IS...

A collaboration between...

- Private Sector
- Public Sector (local & state)
- Academic Institutions

...integrated program of economic
development to grow the GDP in Washtenaw
and Livingston Counties

That is ...

focused

consistent

intentional

persistent

and takes the long term view

Based on shared values,
Innovative service,
Open source economic development,
and Regional collaboration

Ann Arbor SPARK Five Year Strategic Plan

Acceleration

Create long term regional prosperity by accelerating the growth of start-ups and early stage companies through investment and by support through offering direct and consultant services.

Talent

Maximize the retention, development and attraction of knowledge workers through convening and collaborating with partner organizations and direct program delivery to meet the needs of early stage and mature companies we serve.

Growth

Maximize job creation and capital investment growing the region's GDP through the retention and expansion of mature driving industry companies and the targeted attraction domestically and internationally of similar companies that fit the region's identified clusters.

Leadership

Further strengthen the Ann Arbor SPARK organization to maintain SPARK's position as one of the nation's and world's leading economic development organizations. Increase Ann Arbor SPARK's role in activities that advance regional collaboration toward economic prosperity.

Planning

Lead the creation of a long-term strategic framework for maximizing the Ann Arbor region's economic competitiveness globally in the year 2025 that reflects best practices, new opportunities with appropriate partners and that is informed by stakeholder input.

Values

Innovative Service

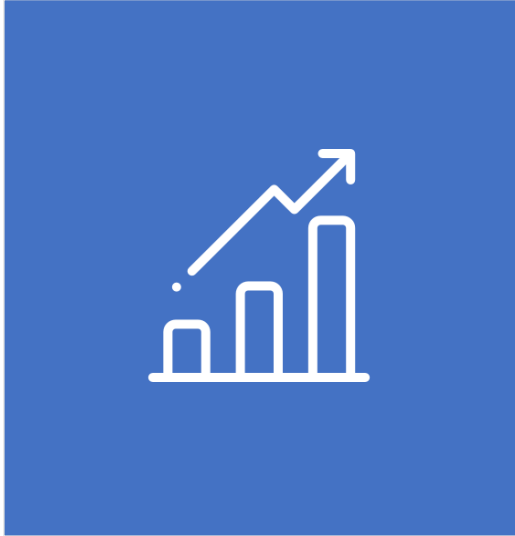
Open Source Economic Development

Regional Collaboration

Mission

Ann Arbor SPARK advances the region by encouraging and supporting business acceleration, attraction and retention. Our organization identifies and meets the needs of business at every stage, from start-ups to large organizations. Ann Arbor SPARK collaborates with business, academic, government, and community investor partners to position the region as a destination for innovation.

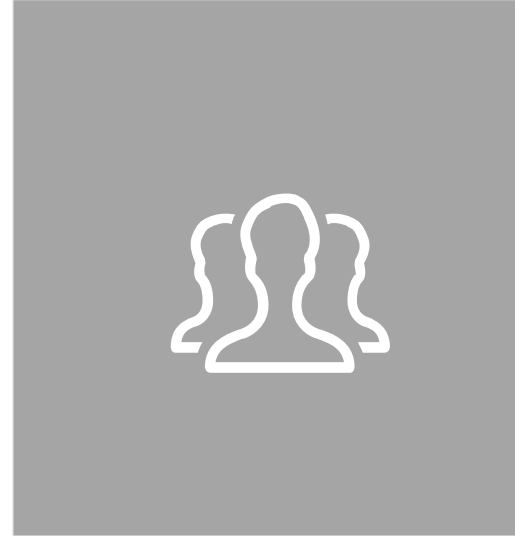
SPARK's Major Areas of Activity



**BUSINESS
DEVELOPMENT**



**ENTREPRENEURIAL
SERVICES**

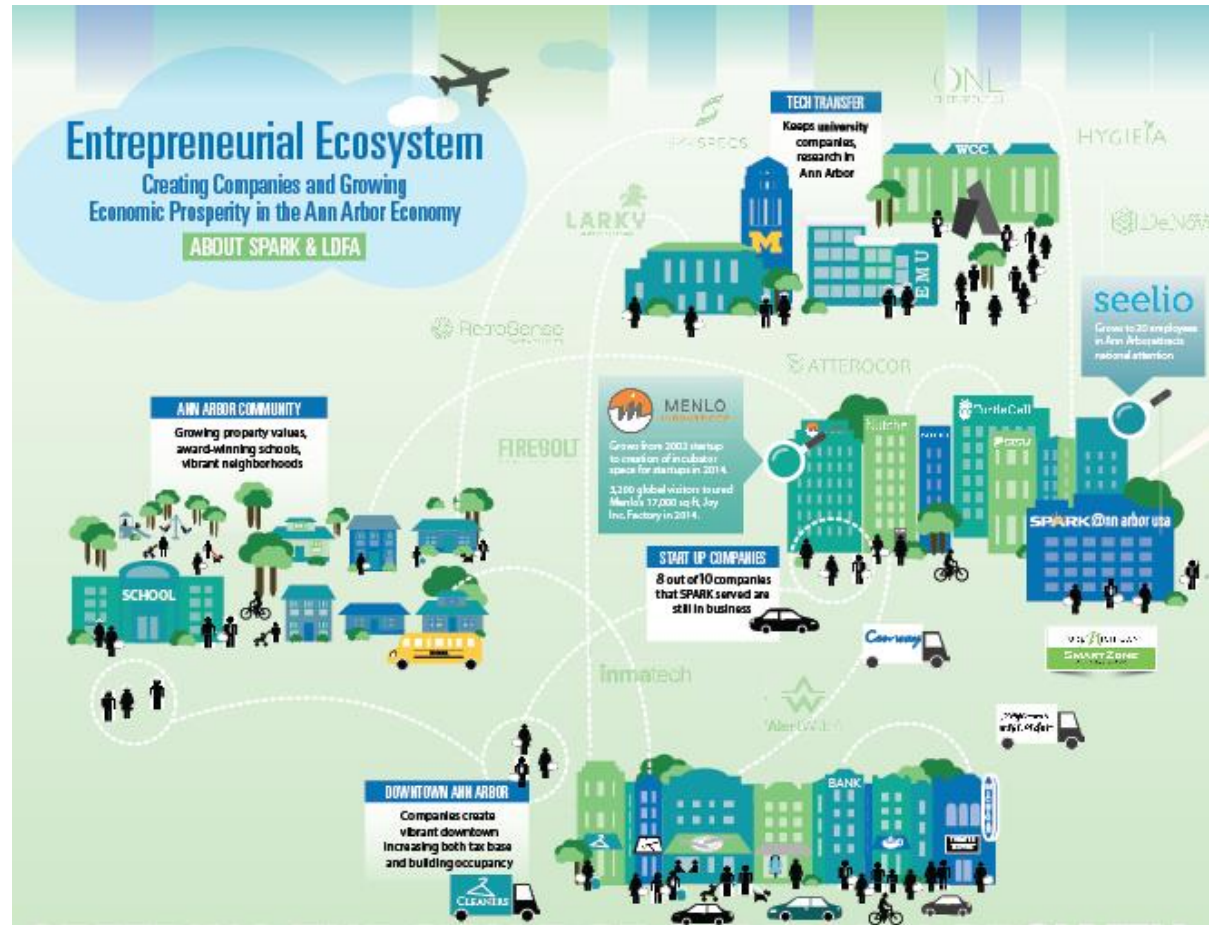


**TALENT
ATTRACTION**

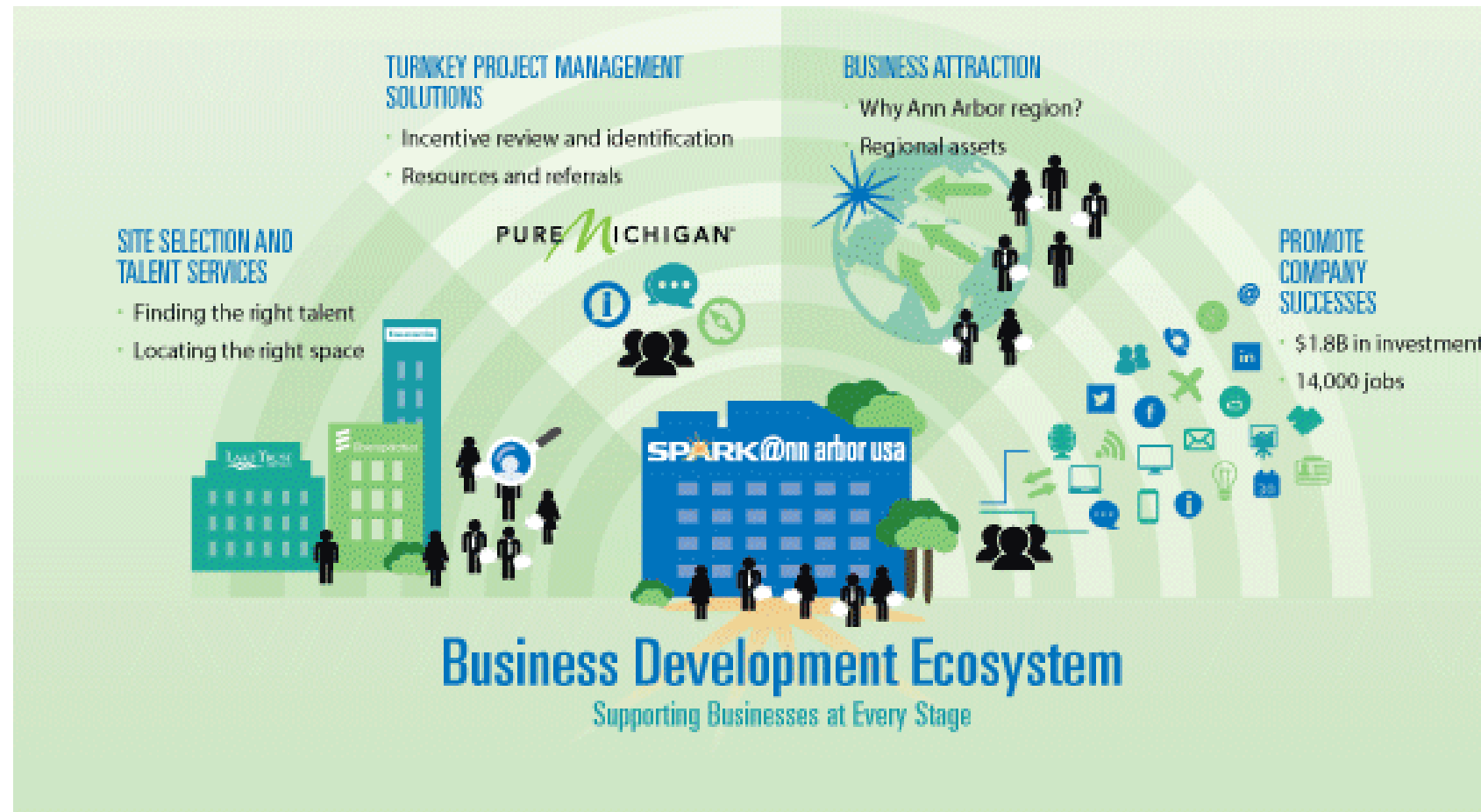


**STRATEGIC
PROJECT
LEADERSHIP**

What We Do – Entrepreneurial Services



What We Do – Business Development



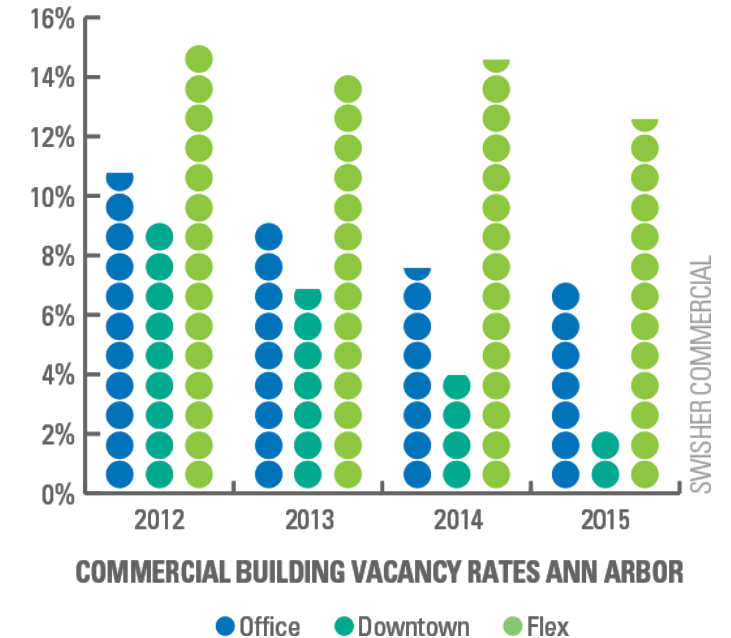
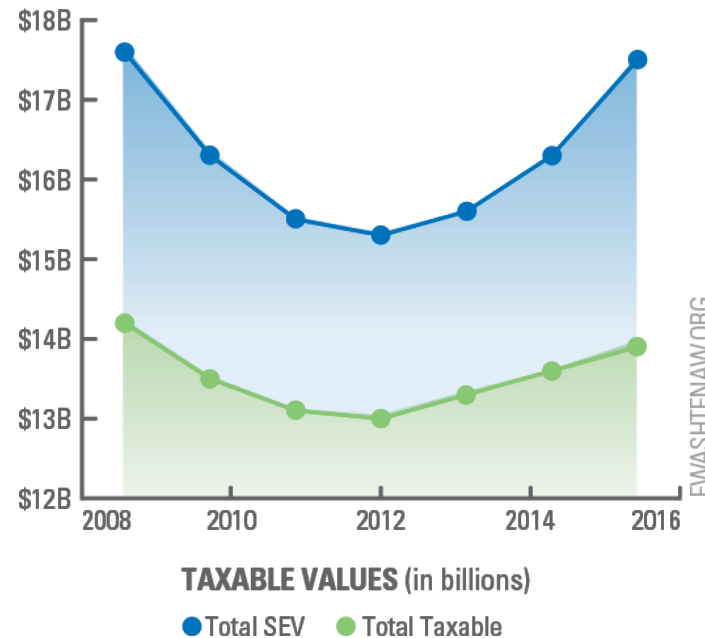
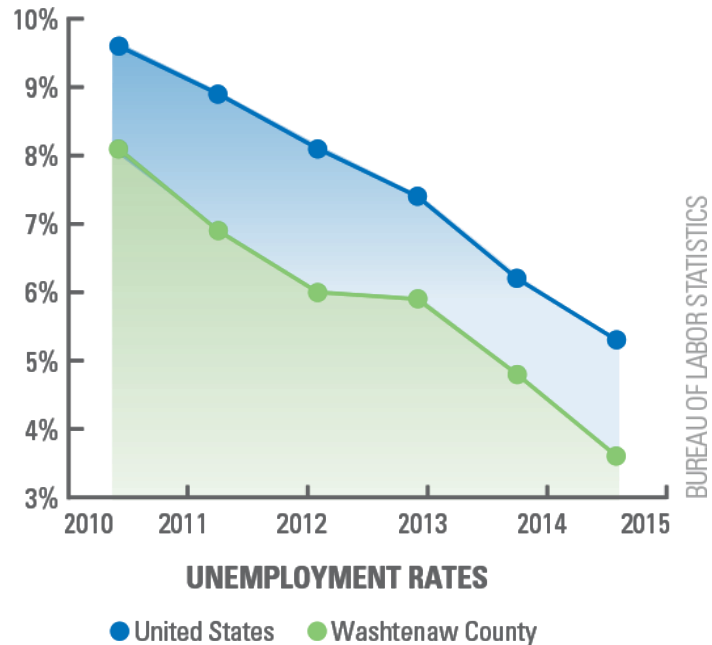
Outward-Oriented Industries Drive Rest of the Economy

Community Success Factors Shaped by our Public Private Partnership



Why is this important?

Region's growth by-the-numbers

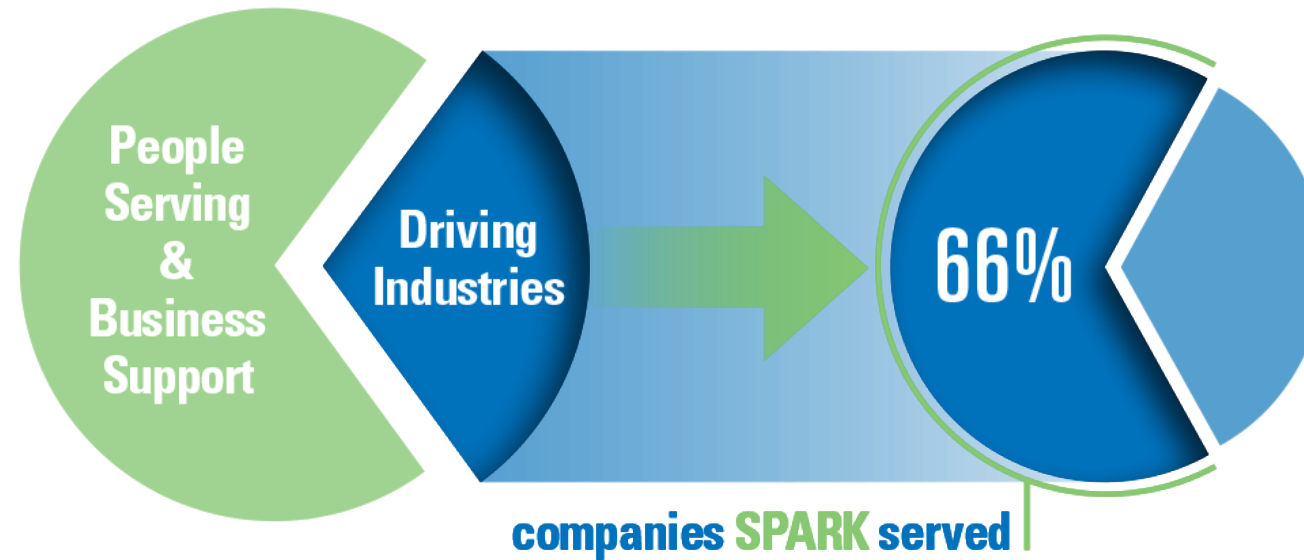


growing and thriving

PRIVATE SECTOR JOB GAINS Washtenaw County 2010-2015

11,266 New Jobs

Driving Industries



Quadruple Helix



PRIVATE SECTOR



GOVERNMENT

SPARK
@nn arbor usa



FOUNDATIONS / NGOs



HIGHER EDUCATION
Mainly the University of Michigan

“Ann Arbor home to Michigan’s New Economy”

- Detroit Free Press

“Ann Arbor appears to be our Silicon Valley”

- Detroit Free Press

“Michigan’s new Motor City”

- New York Times

“Start-up City”

- Delta Sky Magazine

“A New Tech Hub”

- New York Times

Start-up
At the Former Home to Borders Books, a Tech Hub Now Sprouts

Square Feet
By STEVE PRESS NOV 8, 2014

Detroit Free Press
PART OF THE USA TODAY NETWORK

Ann Arbor home to Michigan's new economy

John Gallagher, Detroit Free Press 10:39 p.m. EDT July 16, 2016

TECH TREK
FOR THE FUTURE

(Photo: John Gallagher)

Adjacent buildings in downtown Ann Arbor of Borders, the bookstore chain that filed for driven foot traffic in the area. Felicia Costar

ANN ARBOR, Mich. — Street, four blocks from returned from the dead

At almost any hour of

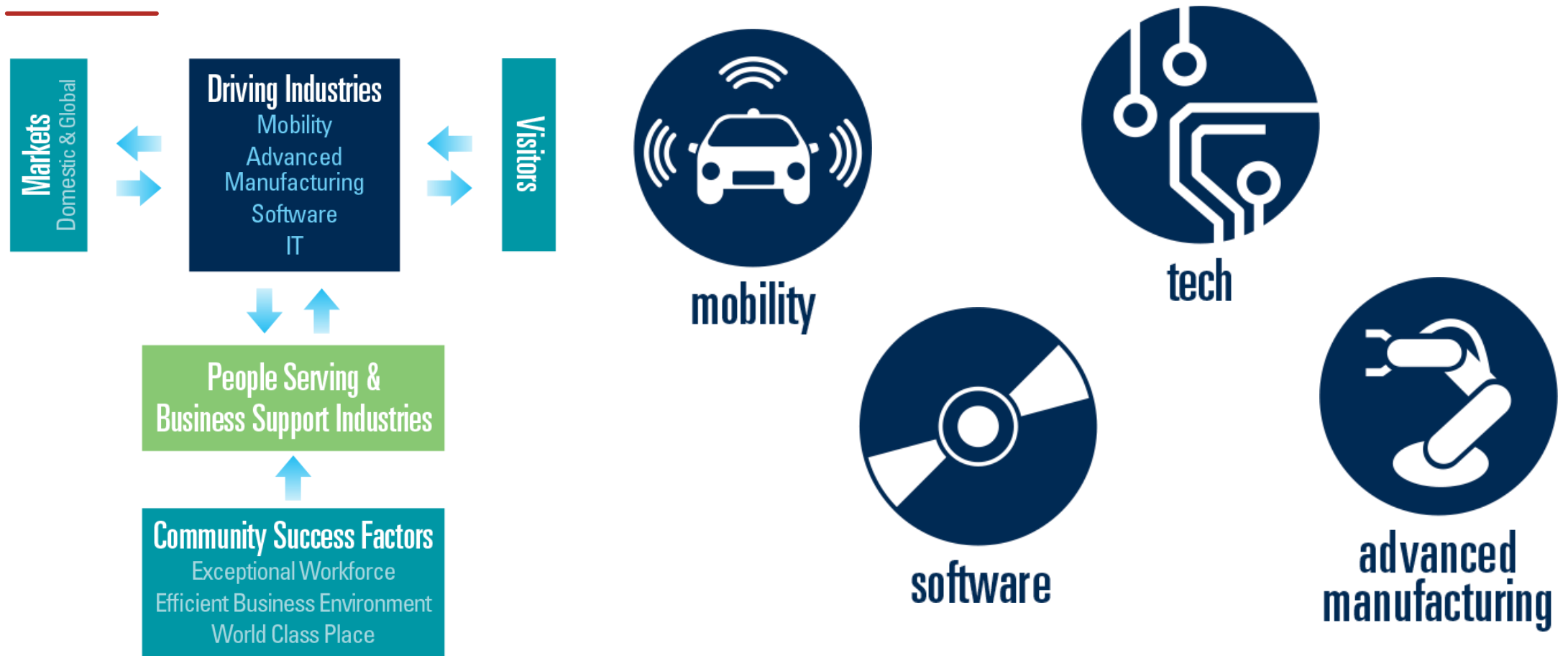
As often happens with venture investments, most of the cash went to companies unknown but to insiders in their industries. The big winner was a medical research firm called NeuMoDx Molecular in Ann Arbor, which received \$20 million from an unnamed venture investment firm. That was followed by a cancer research firm called Strata Oncology, an apartment-finding tool called Cribspot, and others from AA.

Venture capital is money put at risk with emerging young companies, often in trending fields such as life science, technology, medical devices, and media, in anticipation that the investments will pay off as the start-ups grow into successful companies.

These are risky investments; not all start-up firms make it. Sometimes promising new pharmaceuticals fail their clinical trials; sometimes a promising new technology gets overtaken in the marketplace by something even newer and better.

But the presence of venture capital in a state is a sign that the economy is renewing itself with fresh ideas and new players. And that's what's exciting now in Michigan's economy. The amount of venture cash invested here has soared from less than \$1 billion 10 years ago to about \$5 billion today.

Driving Industries



FOUNDATION FOR GROWTH OF AN INNOVATION ECONOMY

Companies We Touch



An aerial photograph of a city at sunset. The sky is filled with vibrant colors of orange, pink, and purple. The city below is illuminated by streetlights and building lights, creating a warm glow. The text "Creating an Innovation Hub" is overlaid in the center of the image in a white, sans-serif font.

Creating an Innovation Hub

Rapidly Growing Tech Sector

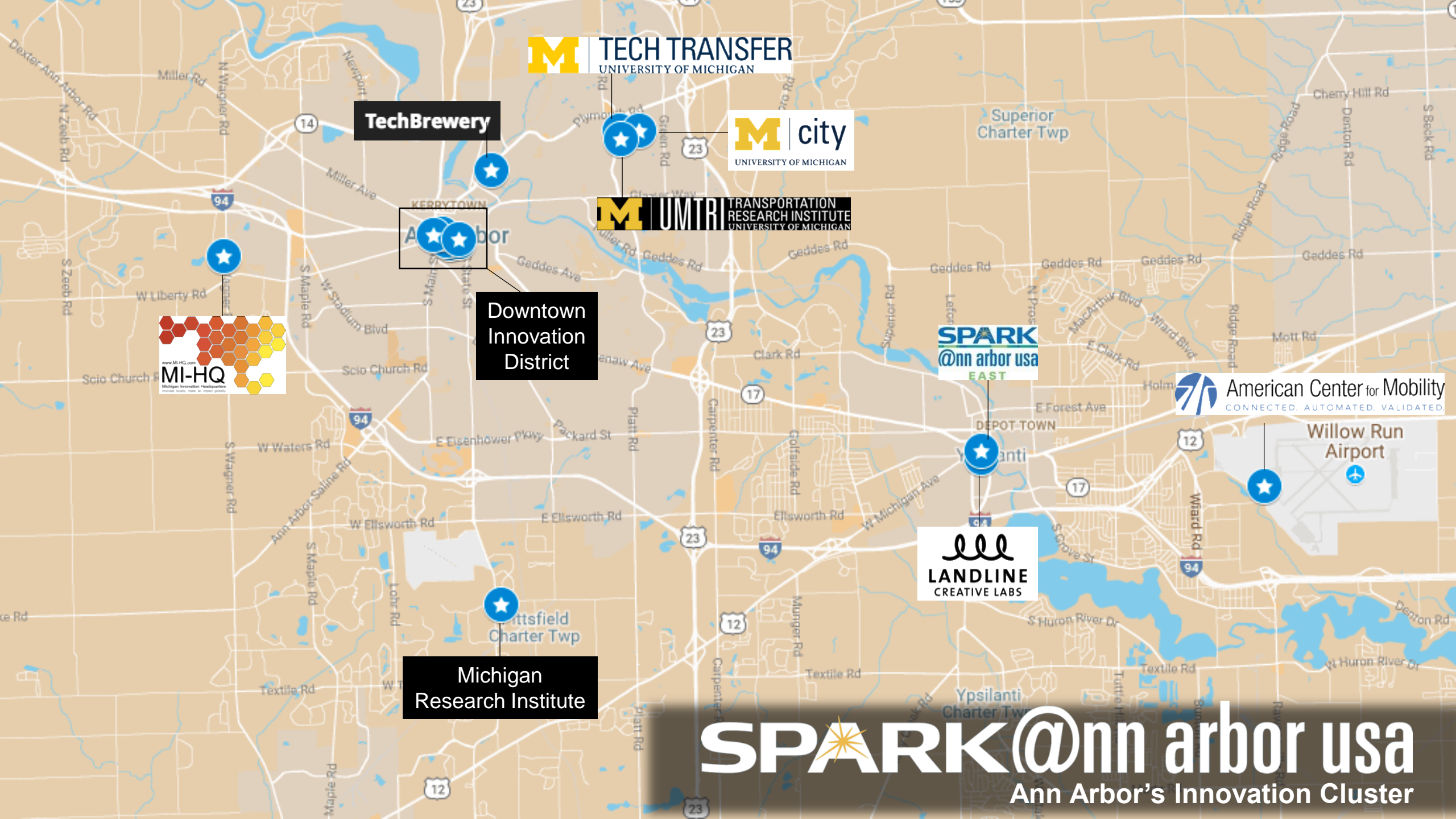


SPARK@nn arbor usa

Ann Arbor's Innovation Cluster



[View this map online](#)



M TECH TRANSFER
UNIVERSITY OF MICHIGAN

TechBrewery

M city
UNIVERSITY OF MICHIGAN

M UMTRI TRANSPORTATION
RESEARCH INSTITUTE
UNIVERSITY OF MICHIGAN

Ann Arbor

**Downtown
Innovation
District**

MI-HQ
Michigan Innovation Headquarters

SPARK
@ Ann Arbor USA
EAST

American Center for Mobility
CONNECTED. AUTOMATED. VALIDATED.

**Willow Run
Airport**

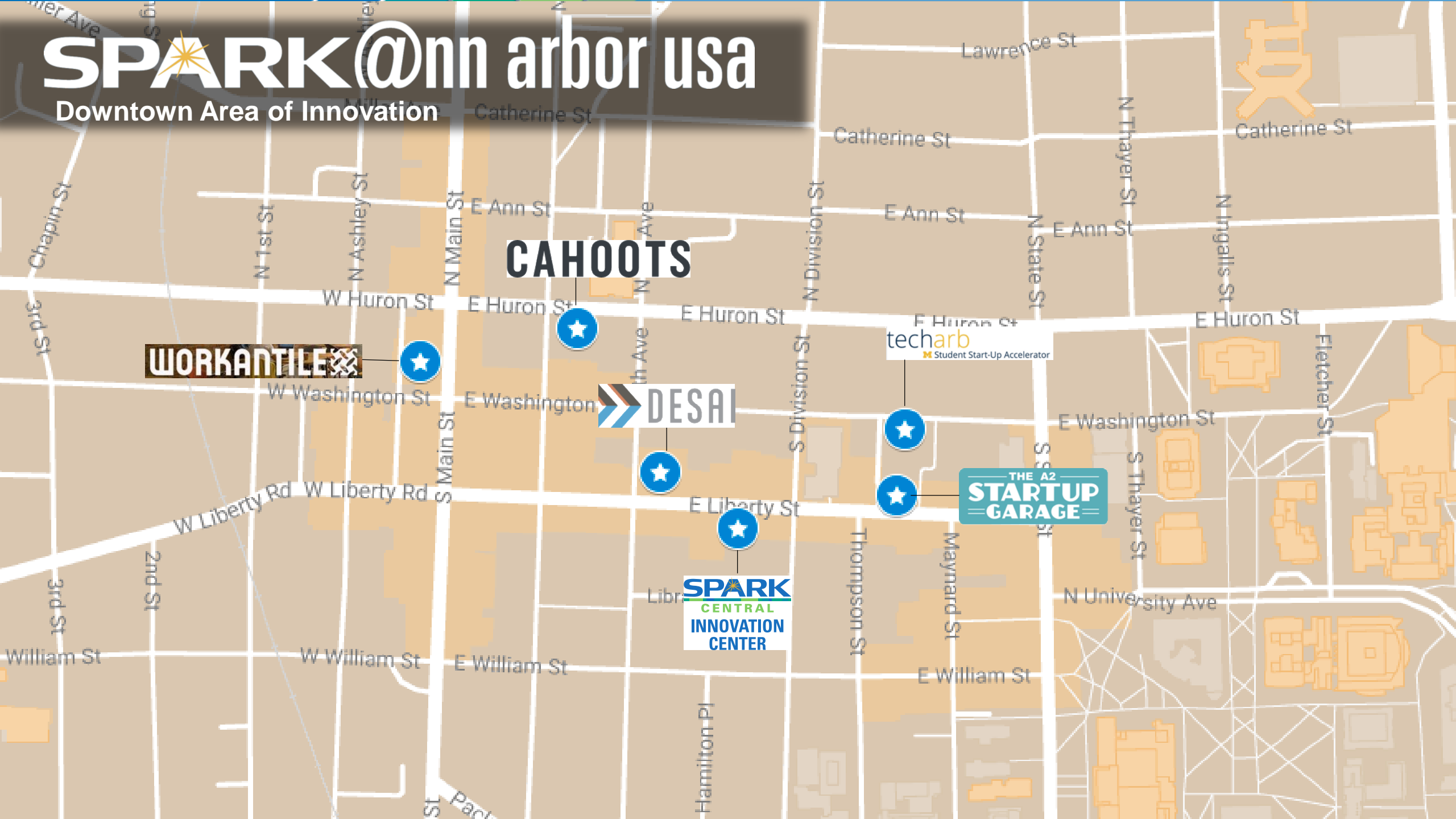
lll
LANDLINE
CREATIVE LABS

**Michigan
Research Institute**

SPARK @ Ann Arbor USA
Ann Arbor's Innovation Cluster

SPARK@nn arbor usa

Downtown Area of Innovation



CAHOOTS

WORKANTILE

DESAI

SPARK
CENTRAL
INNOVATION
CENTER

techarb
Student Start-Up Accelerator

THE A2
STARTUP
GARAGE

SPARK Central Innovation Center

1ST FLOOR

1-5
EMPLOYEES

Early stage startups or virtual tenants

24 Drop-in workstations



3RD FLOOR

5-10
EMPLOYEES

2500 Sq Feet

Growing startups looking for permanent desk space



4TH FLOOR

10-20
EMPLOYEES

6600 Sq Feet

Newly Renovated

Domestic and International Companies looking to establish a presence in downtown Ann Arbor



AMENITIES

Modern, collaborative space

3 Full Kitchens

Dedicated conference rooms

Administrative support

Lightning-fast 500 mbps fiber internet

On-site mentoring and educational workshops

SPARK's Entrepreneurial Services

2017

217 Innovation startups assisted

657 FTEs employed by these companies

85 Incubator clients nurtured

2012-2017

807 Innovation startups assisted

2,415 FTEs employed by these companies

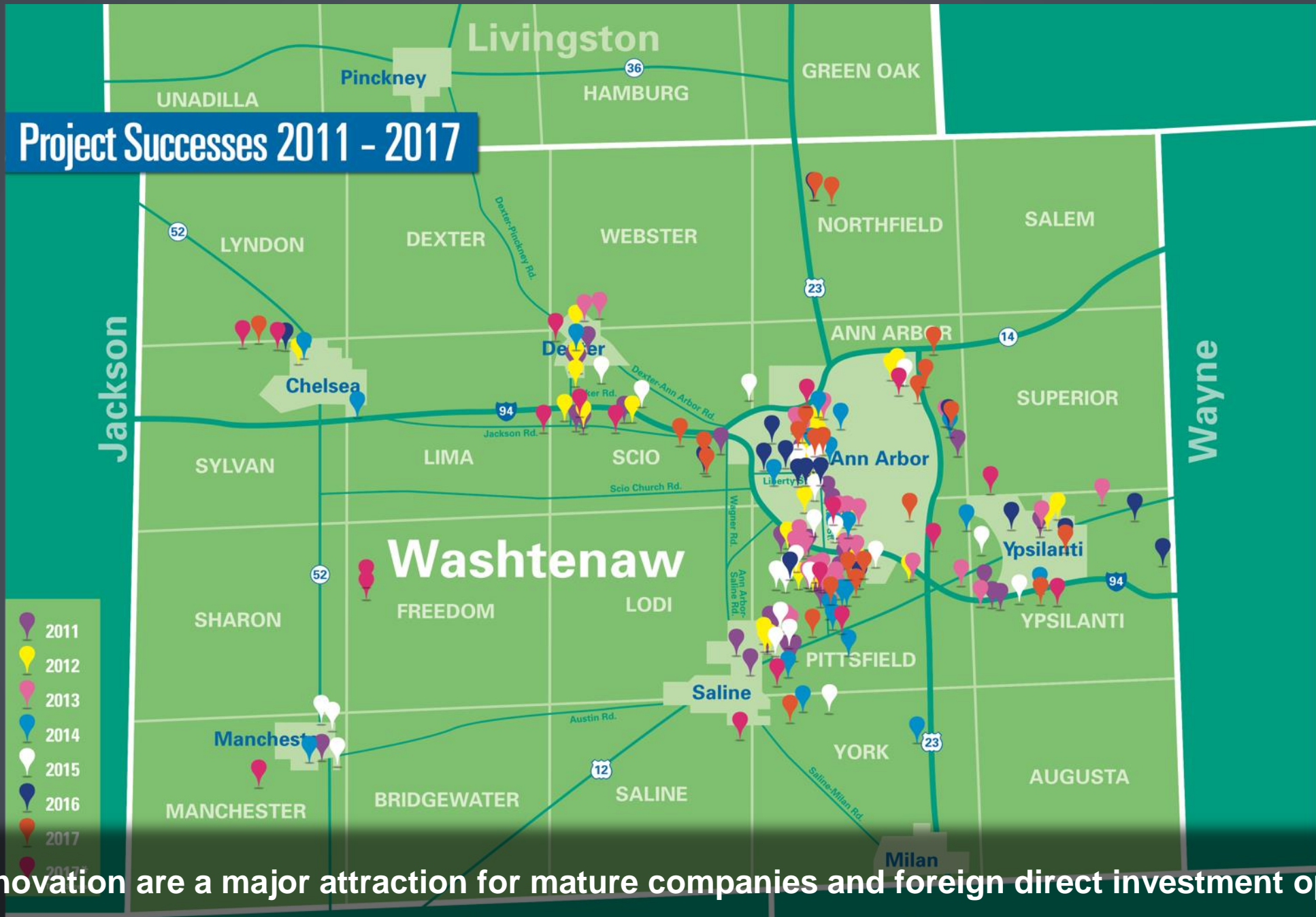
186 Incubator clients nurtured

\$3.5 M Grants to startups

\$603 M Private equity, grants, debt raised



Project Successes 2011 - 2017



Areas of Innovation are a major attraction for mature companies and foreign direct investment opportunities

2011-2017



241 project successes



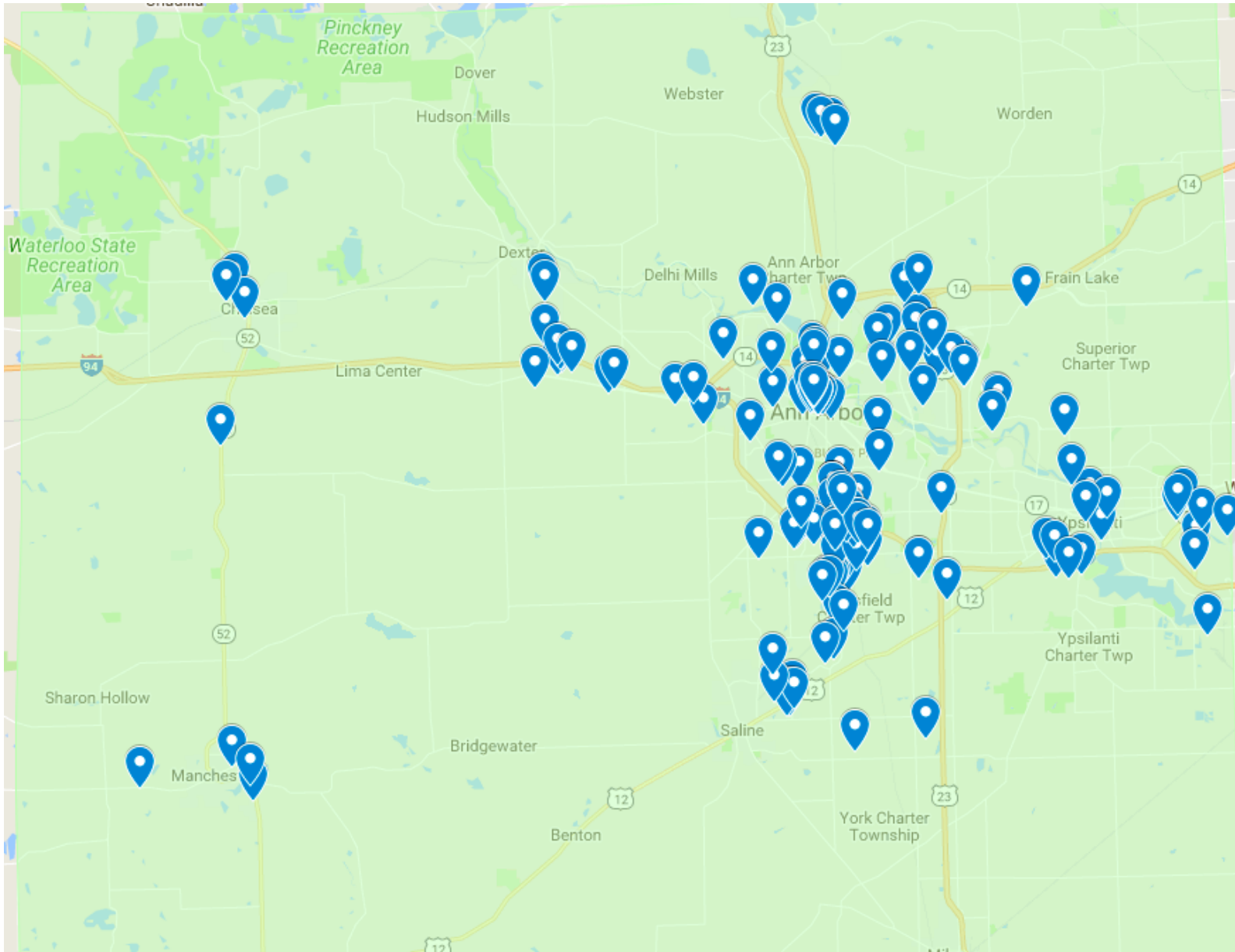
17,795 new and retained jobs



\$708.4 M total investment

An aerial photograph of a city at sunset. The sky is filled with vibrant colors of orange, pink, and purple, transitioning into a dark blue twilight. The city below is illuminated by streetlights and building lights, creating a warm glow. The buildings are mostly multi-story structures with flat roofs, some featuring rooftop HVAC units. A prominent white bus is visible on a street in the middle ground. The overall scene conveys a sense of urban activity and modern infrastructure.

Testing & Validating New Mobility Technologies



Mobility Ecosystem in Ann Arbor

189 mobility companies in Washtenaw County from **2** to **2,000** employees

Includes companies that also work in the following industries:

Artificial Intelligence, Augmented Reality, Alternative Energy, Aerospace, Big Data, Business Services, Consumer Products & Services, Drones, Homeland Security & Defense, IoT, Information Technology, Life Sciences, Manufacturing, Optics, Printing & Publishing, R&D, Virtual Reality.

AMERICAN CENTER FOR MOBILITY



American Center for Mobility
CONNECTED. AUTOMATED. VALIDATED.



ACM OFFICIALLY OPEN FOR TESTING

The American Center for Mobility (ACM) has opened its state-of-the-art proving grounds for testing, with Visteon Corporation and Toyota Research Institute on site to begin testing operations.

[Click here to learn more about the American Center for Mobility >](#)



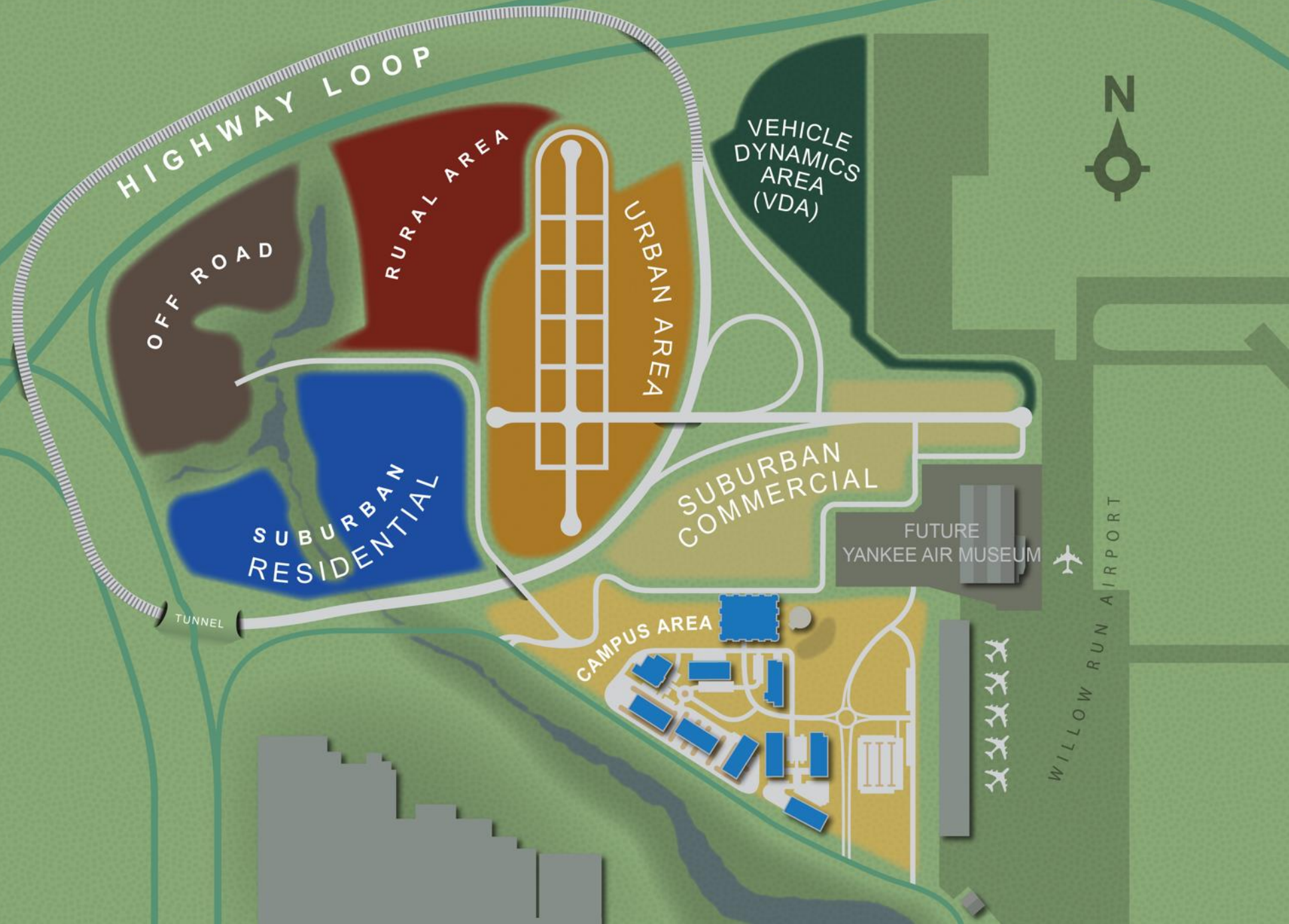
Partners – building the platform





American Center for Mobility
CONNECTED. AUTOMATED. VALIDATED.

Area Map



ACM Headquarters and Campus



Testing Scenarios



EXITING A CURVED TUNNEL

Tesla Case: bright sky & light colored truck



OVERHEAD PASSES

Vehicles on top of each other



WEATHER CONDITIONS

Testing during snow in picture



EDGE CASES WITHIN CITY

Intersections, roundabouts, multimodal



Education & Workforce Development



American Center for Mobility leads collaborative effort on education, workforce development with 15 Michigan colleges and universities

Newly formed ACM Academic Consortium highlights need for growing mobility industry

YPSILANTI TWP., MI, Oct. 16, 2017 — The American Center for Mobility (ACM), in partnership with 15 colleges and universities across Michigan, today announced the creation of the Academic Consortium at ACM to train the next generation of high-tech talent at the state-of-the-art connected and automated vehicle technologies (CAV) facility in Southeast Michigan.

An aerial photograph of a city at sunset. The sky is filled with vibrant colors of orange, pink, and purple, transitioning into a deep blue. The city below is illuminated by streetlights and building lights, creating a warm glow. The buildings are densely packed, with various architectural styles visible. The text "City as a Living Laboratory" is overlaid in the center of the image in a white, sans-serif font.

City as a Living Laboratory

Open Platform & System Thinking

Create a secure, open “**operating system**” that will enable “**plug and play**” of existing and new hardware such as multi-modal assets and street-level infrastructure as well as software technologies like **data management, optimization** and **payment** etc. to allow for maximum efficiency and access for all.

Digital & Physical Infrastructure

- **Data Collection & Information Sharing:** MDOT has 115 DSRC roadside units deployed across Southeast Michigan. MDOT is using DSRC technology for red light violation warning, work zone warning, road weather management, and pavement condition monitoring.
- **Cyber Security:** The University of Michigan was part of the ARPANET research effort that was the forerunner of today's Internet and the Pinckney Cyber Training Institute have attracted several small companies focused on automotive embedded control systems, specifically automotive cybersecurity
- **Policy & Finance structures:** Developing progressive policy to create accessible and sustainable cities that reflect the true cost of develop and maintain this new infrastructure.

Public Private Innovation

- Intentional creation of a quadruple helix **structure** that cultivates relationships between **government**, the **private sector**, the **University of Michigan**, and the neighboring city of Detroit.
- Implement a **prototype** of a living laboratory for mobility technology in downtown Ann Arbor. Working closely with **8 stakeholders** including Amazon Web Services, Deloitte Consulting, Ford Smart Mobility, the City of Ann Arbor, and the University of Michigan.
- This demonstrates that beyond the physical assets of Ann Arbor, the community of actors is crucial to building and maintaining a living and breathing Area of Innovation.

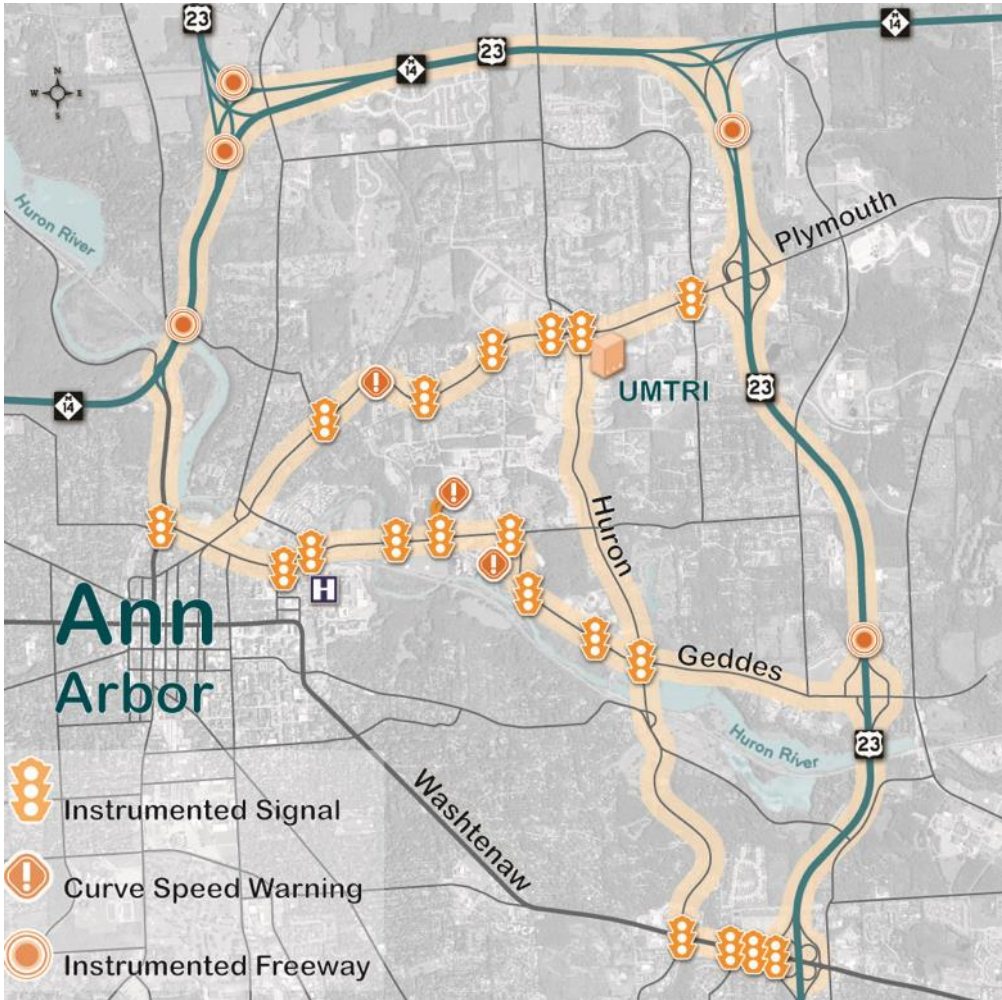
Public Engagement

Engaging the public early on as a partner in the solutions development & deployment

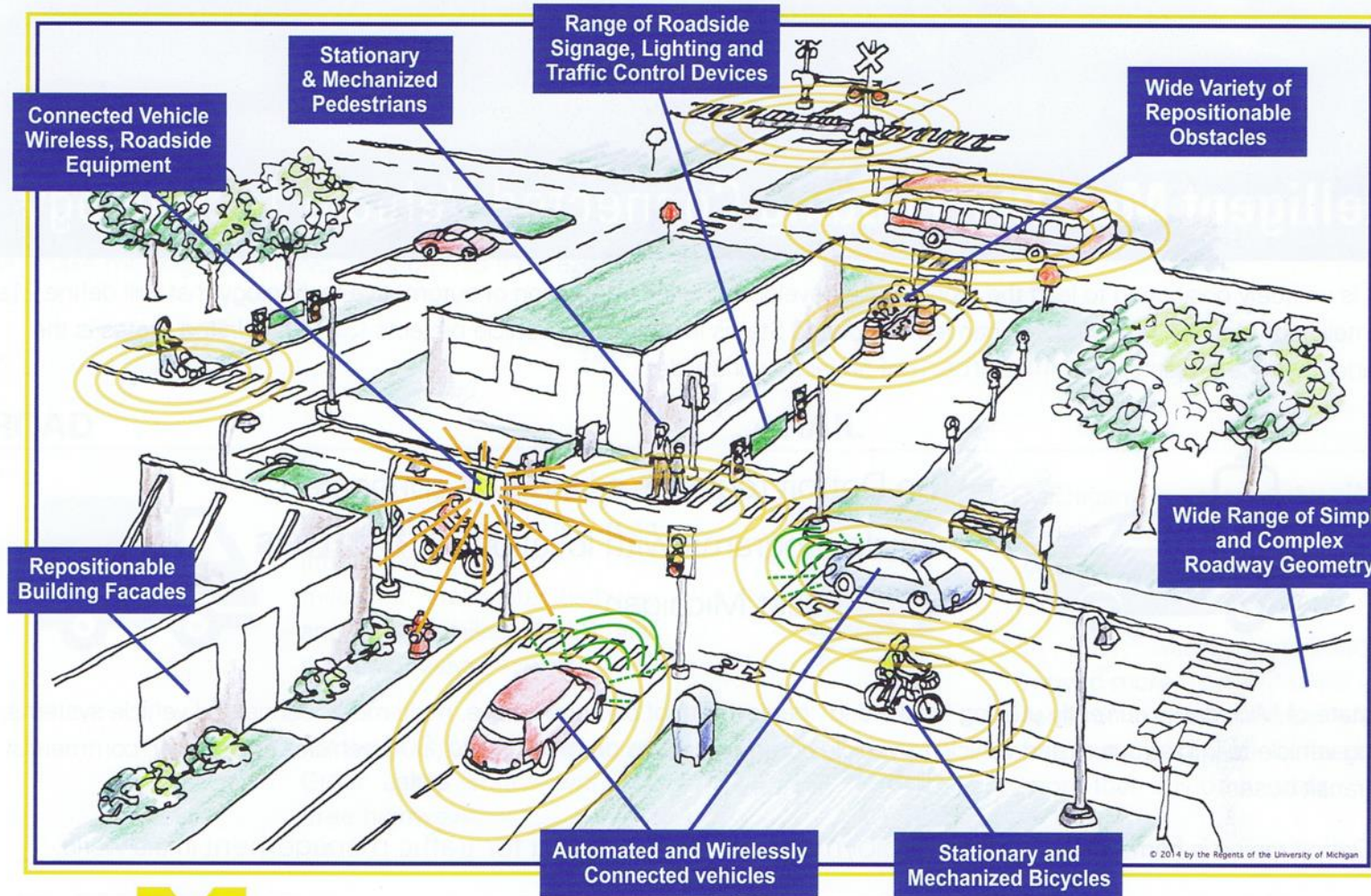
- By involving the public early on, cities can better understand their needs and develop solutions that respond to those needs.
- Encourage them to be willing participants in the deployments and research to help create more meaningful solutions.

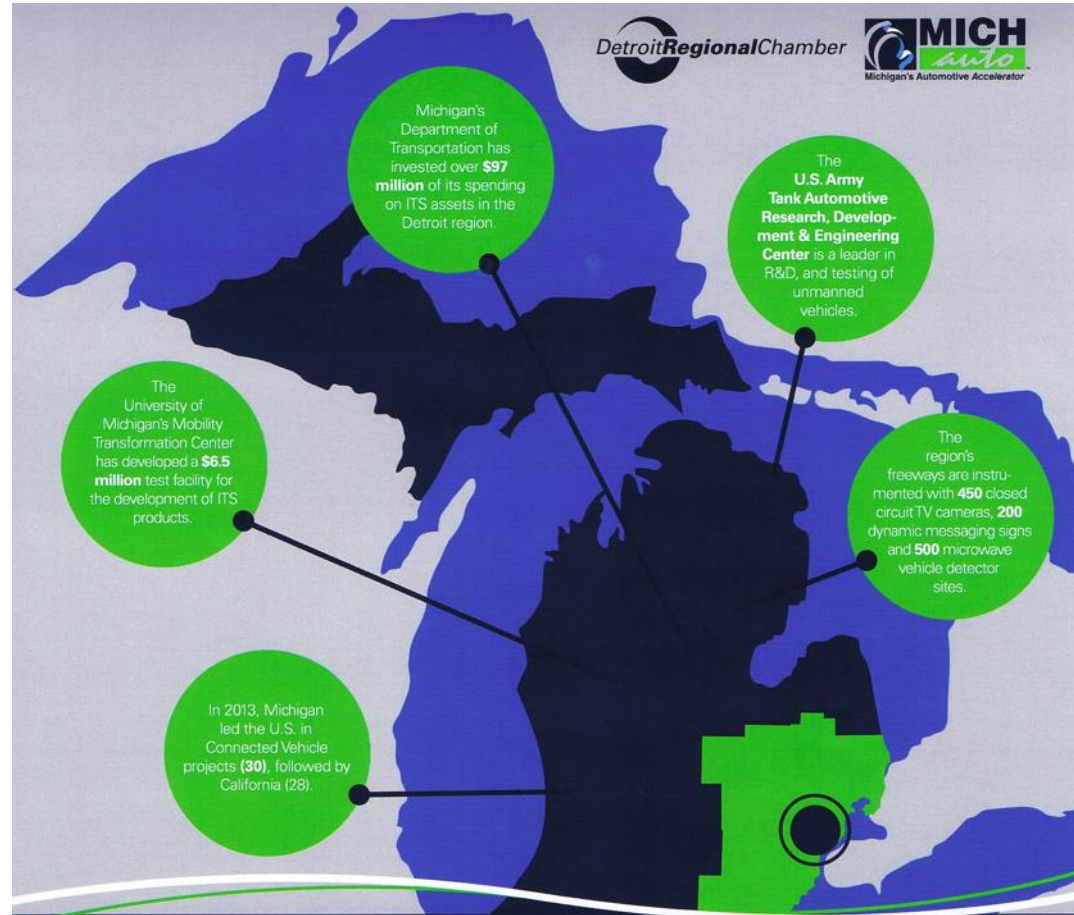
Example: From 2015-2018 University of Michigan Transportation Research Institute (UMTRI) equipped over 2800 vehicles owned by local volunteers and 29 roadside locations with connected vehicle technologies to inform how well connected vehicle safety technologies and systems work in a real-life environment with real drivers and vehicles. Building on the success of SPMD, UMTRI and its partners have launched a new deployment is called the Ann Arbor Connected Vehicle Test Environment (AACVTE) which when completed will be the world's largest operational, real-world deployment of connected vehicles and connected infrastructure.

Safety Pilot: 9K to 25K vehicle to infrastructure test









Intelligent Transportation Systems

in the Detroit Region

CEO ROUNDTABLE

vision for the future

What are our competitive advantages now versus other US regions?

What do you hope the Ann Arbor region will be like?

What must we tackle in the next five years to position ourselves to be a successful economic region in 2030?

What are the key issues facing our community to get to that desired state?

Some big theory takeaways:

“The rise of (areas of innovation) seem perfectly aligned with the disruptive dynamics of our era –

- **crowd sourced** rather than **close sourced**,
- **entrepreneurial** rather than **bureaucratic**, and
- **networked** rather than **hierarchical**.

(areas of innovation) also intensify the very essence of cities: an aggregation of talented, driven people assembled in close quarters, who exchange ideas and knowledge” *Bruce Katz and Jennifer Bradley – The Metropolitan Revolution*

“...a dynamic process of innovation, imitation and improvement.” *Sir Peter Hall – “Cities in Civilization: Culture, Innovation and Urban Order*

Upcoming Events

April 17, 2018

Ann Arbor SPARK's Annual Meeting & Regional Economic Forum

10:30 am - 1:00 pm

Eastern Michigan University Student Center

June 13-15, 2018

Meeting of the Minds

Downtown Ann Arbor

FastTrack Awards

Downtown Ann Arbor

A2 Tech Talk

Michigan Theater

A2 Tech Trek

Downtown Ann Arbor



THANK YOU

Q&A



Ann Arbor SPARK



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