Marysville-Union County Port Authority

33 Smart Mobility Corridor Economic Development Strategy

May 2018

Ady Advantage™

STRATEGY MATTERS

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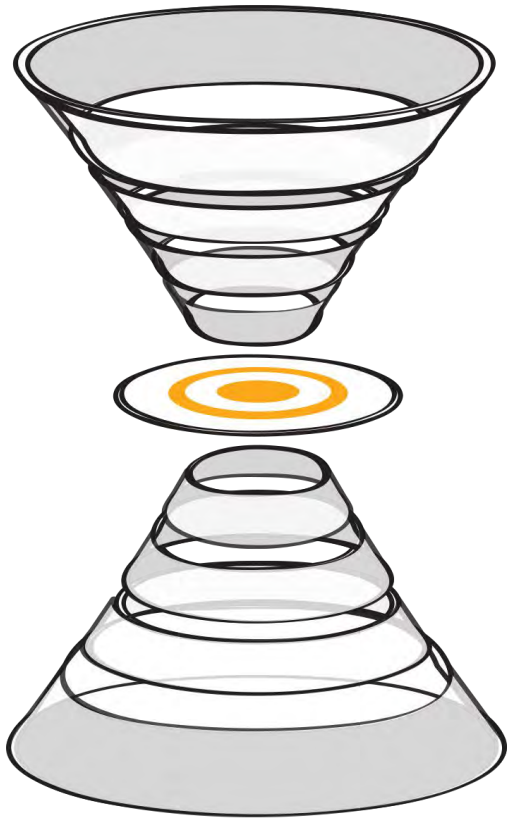
Executive Summary

Ady Advantage was retained by Marysville-Union County Port Authority to create an economic development strategic plan aimed at leveraging the 33 Smart Mobility Corridor. The following graphic shows the various elements to this project.



INITIAL ASSESSMENT

PHASE 1: DISCOVER

- Competitive Assessment
- Review Existing Data
- On-site Visit

INTEGRATED ANALYSIS

PHASE 2: DISTILL

- Scorecard Analysis
- Goals and Visioning Workshop
- Goals and Strategies Development

STRATEGIC PLAN

PHASE 3: DO

- Create Framework
- Strategic Plan Development
- Develop Implementation Map

This process consisted of secondary desk research, a competitive analysis of multiple regions, on-site qualitative research with stakeholders and employers, and uniquely tailored goals. The following pages serve as a summary of these findings.

STAKEHOLDER AND EMPLOYER INPUT

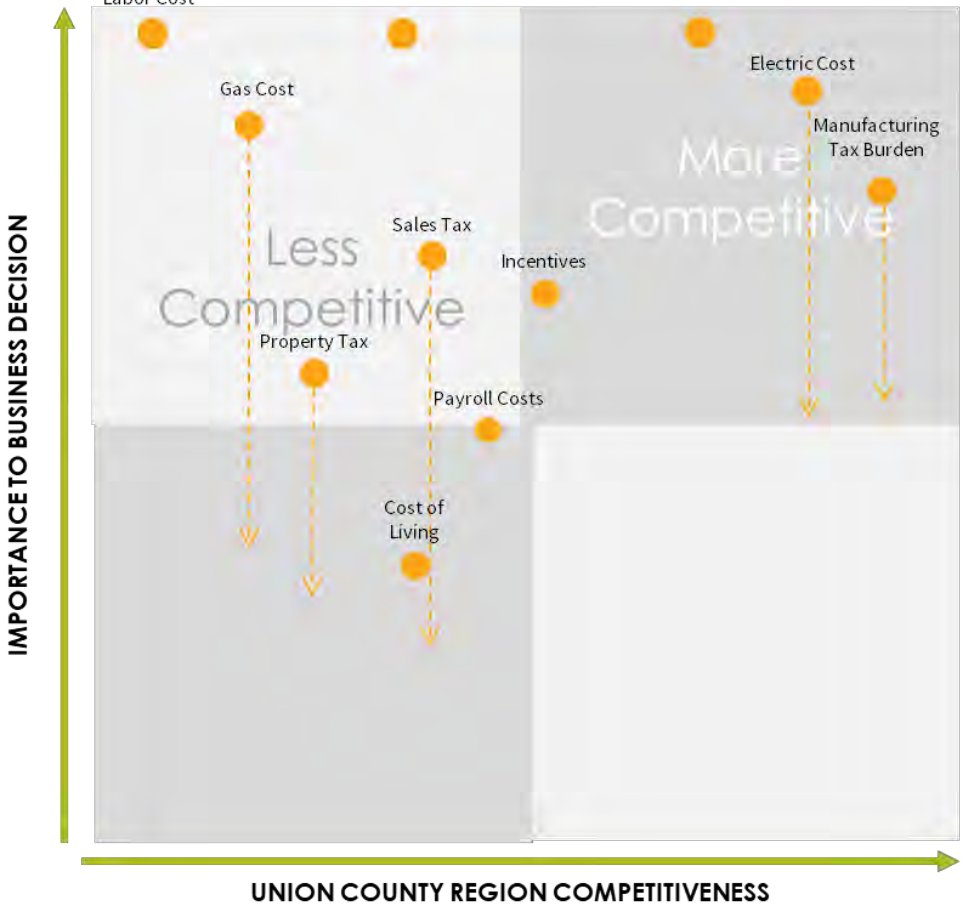
During the on-site visit Ady Advantage conducted interviews and focus groups with a variety of stakeholders to gain input. The stakeholders included a mix of local businesses, economic development partner organizations, educational institutions, etc. These individuals provided input on strengths, weaknesses, opportunities and threats in the region. The following key themes emerged:

- Employers noted access to talent as one of their largest challenges. They noted the lack of marketing and messaging that is used in the area to bring talent to the regions. The average rating for talent availability was 2.5 on a 5-point scale with 5 being most available. Employers gave high ratings to productivity, work ethic, and stability. They noted three primary opportunities for talent development, including soft skills training, technical and professional, indicating the need to focus on strategic thinking, organizational design, and skilled trades technicians.
- Increased opportunity exists to capture talent graduating from nearby higher education facilities. This is especially true in the engineering field. Intense competition exists in the San Francisco area for talent recruitment, which directly impacts the ability to retain graduates in the region. However, there are many partnerships in the region that can be leveraged to bring more opportunities for retention along with growing degree programs that can be leveraged for business recruitment and attraction opportunities with in the area.
- Stakeholders noted innovation, relationships, and messaging of all of the assets under one umbrella as an opportunity. Additional opportunities for growth also exist through use of the Transportation Research Center (TRC), Honda OEM and Service Parts Suppliers Conference previously held in Columbus, use of available land in the area, as well as engaging Silicon Valley partners in the region's AV-CV efforts.
- Stakeholders discussed those areas that are lacking or missing. Among the most notable responses was talent/workforce development to ensure the area continues to be competitive in CV-AV technology development and deployment. Stakeholders also indicated that identifying local smart mobility companies and providing a means for them to grow along with improved engagement between citizens and companies, readiness to take on electrification of vehicles, and continued development of current assets (like existing building/spaces, utilities, and infrastructure) were important.

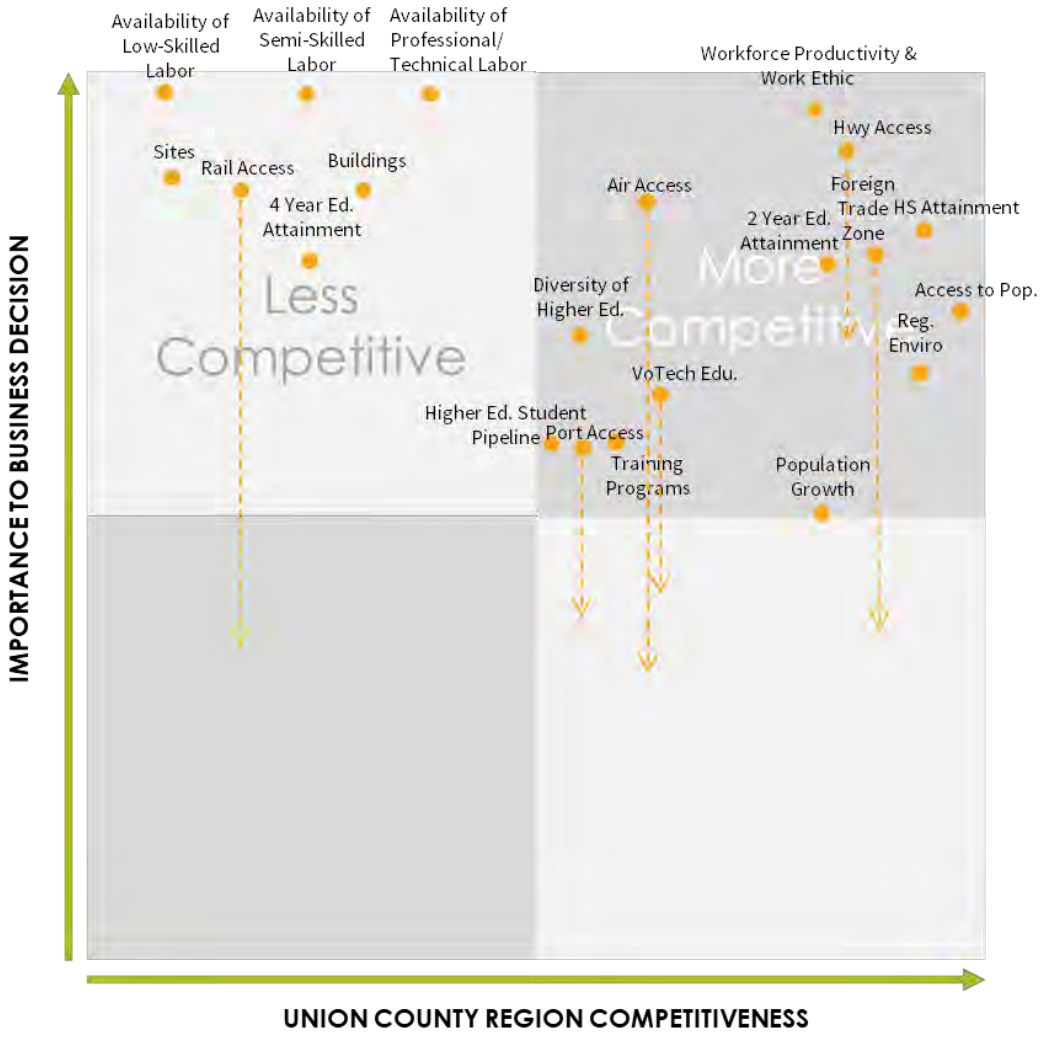
UNION COUNTY'S REGIONAL POSITIONING

The following asset maps depict key business costs and conditions and their importance in a business location decision, as well as how well the area does on each factor. The assets in the upper right hand quadrant become the county's positioning and the assets in the upper left hand quadrant become the gaps that need to be improved, provided these gaps can be influenced by local stakeholders.

GENERAL BUSINESS COSTS ASSET MAP



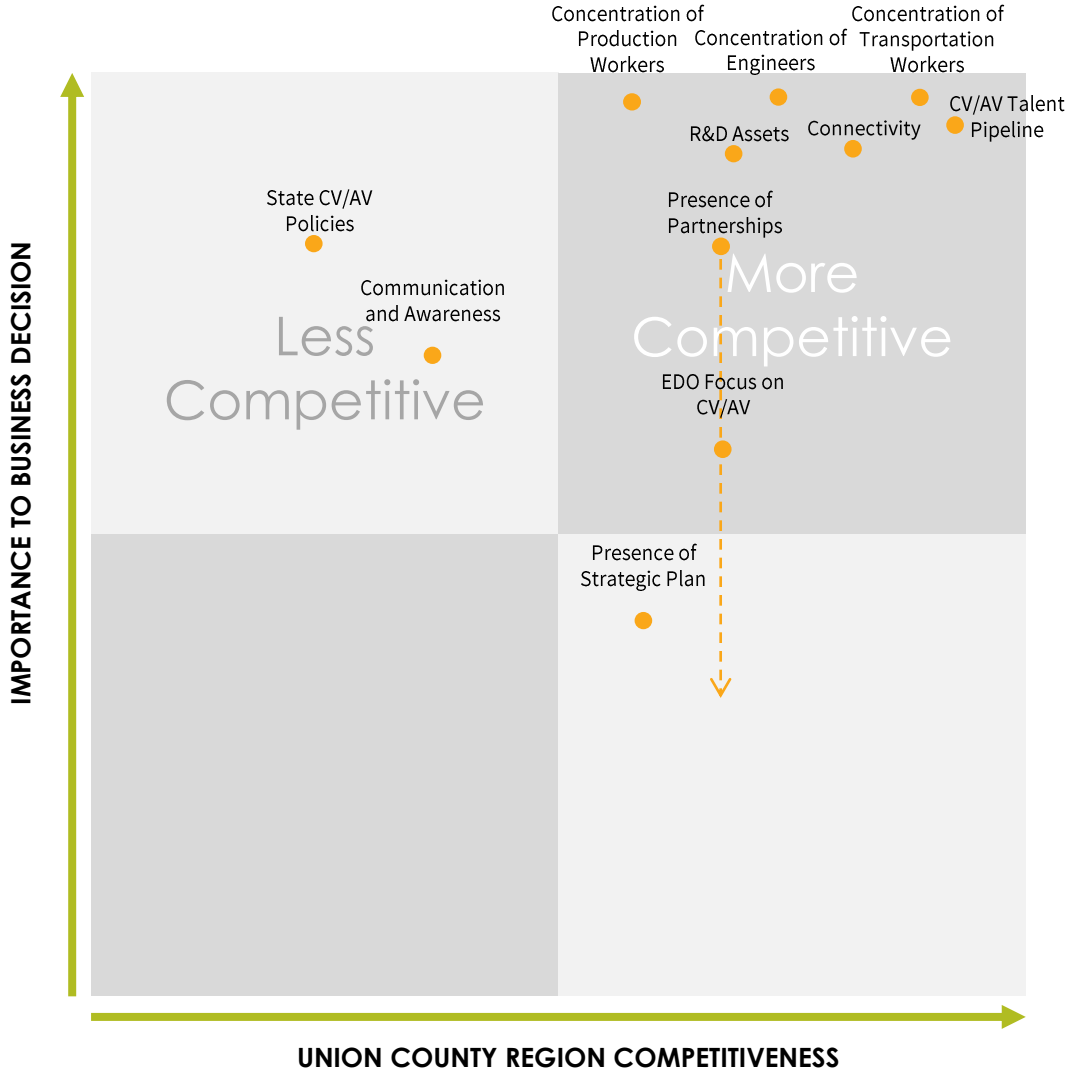
GENERAL CONDITIONS ASSET MAP



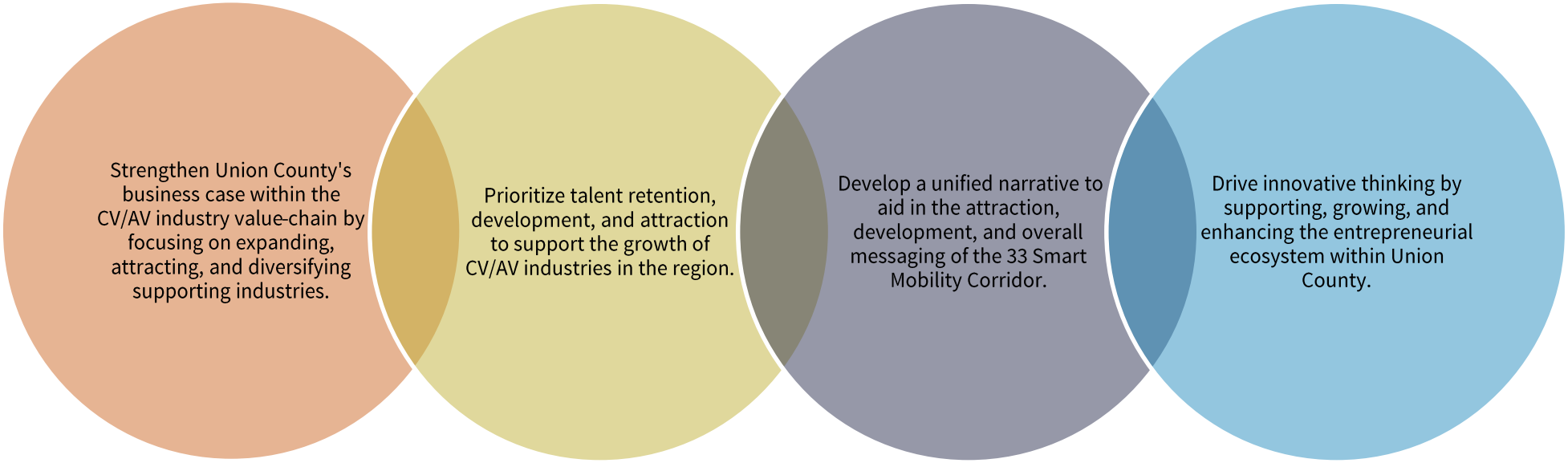
UNION COUNTY'S REGIONAL POSITIONING

The following asset map depicts key assets related to the CV/AV industry and their importance in a business location decision, as well as how well the area does on each factor. The assets in the upper right hand quadrant become the county's positioning and the assets in the upper left hand quadrant become the gaps that need to be improved, provided these gaps can be influenced by local stakeholders.

CV/AV ASSET MAP



The goals for the future were determined and thoroughly discussed during a remotely facilitated Goals and Visioning work session on Thursday, March 2, 2018. These goals serve as the basis for the economic development strategies that follow.



INTEGRATED TACTICS

As an effort of integration of this strategic plan, select elements have been integrated from the 2014 Union County Economic Development Strategy (economic development strategy) into this strategic plan.

The table below depicts the evolution of the 2014 economic development goals to the 33 Smart Mobility Corridor strategic goals.

2014 ECONOMIC DEVELOPMENT STRATEGY GOAL	33 SMART MOBILITY CORRIDOR STRATEGIC PLAN GOAL
Attract employers to the county to diversify the economic base	Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.
Retain and grow the economic base through outreach to existing businesses in Union County	Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.
Create more high-growth enterprises by leveraging the County's entrepreneurs and creating new entrepreneurs.	Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.
Improve the civic infrastructure by providing an environment that supports economic growth and strong communities	Drive Innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.

AREAS OF FOCUS

The economic development strategic plan is organized into a hierarchal framework. The top level consists of four key goals followed by a series of strategies, which are further defined at the lowest level of detail by tactics.

The strategies are further organized into three broad categories, alignment/regionalism, readiness, and marketing and differentiation. These are further organized into areas of focus represented below.

1. **Roles and Responsibilities:** Strategies completed in this area of focus should lead to key designations around specific stakeholders, groups, organizations, etc. that have the capacity and ability to impact outcomes related to the 33 Smart Mobility Corridor strategic goals. These strategies help to create and build a foundation for the succeeding strategies to be successful.
2. **Partnership Development:** This area of focus aims to create and enhance the existing network for economic development. Focusing on building and maintaining partnerships is an important piece of the overall strategic framework to create a more competitive region for the growth and expansion of CV/AV industries. Partners will also be essential in implementing many parts of the overall strategic plan.
3. **Readiness:** Within this area of focus, strategies are set out to develop and enhance the area's overall readiness in three discrete activities: product pipeline development, talent initiative development, and innovation culture building. Product readiness aims to ensure a strong and shovel ready site pipeline for the growth, expansion, and attraction of new and existing businesses. Talent readiness seeks to curate tailored and mixed initiatives to build a sold workforce for new and existing growth. Finally, innovation readiness attempts to build a culture that supports unique and original ideas around the CV/AV industry to support disruptive thinking and enhance the area's positioning overall in the CV/AV industry.
4. **Messaging & Narrative Building:** The area of focus is designed to foster clear and articulated expectations around communicating key messages highlighting the competitive positioning of the 33 Smart Mobility Corridor. It does this through development of a framework to establish a tailored and unique narrative that captures the essence of culture, progress, networks, partnerships, and assets that make-up the overall ecosystem within the 33 Smart Mobility Corridor.

ALIGNMENT/REGIONALISM				
	Goal #1: Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.	Goal # 2: Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.	Goal #3: Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.	Goal #4: Drive innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.
Roles and Responsibilities				
Develop a matrix that outlines and clearly defines the role of each partner in the implementation and execution of the strategic plan and responsibility for supporting the growth of the CV/AV industry.	XX	XX	XX	XX
Develop an understanding of the types of CV/AV projects that Union County will prioritize and how these will be incented.	XXX	X	X	
Develop a communication protocol for prospects and businesses.	XX	X	X	X
Partnership Development				
Facilitate partnerships between supply and demand side of talent.	XX	XXX	X	
Build relationships with OEMs and other major suppliers.	XXX	X	X	X
Maintain and deepen existing partnerships.	XX	XX	XX	X

XXX: Primary effect on goal **XX:** Direct effect on goal **X:** Indirect effect on goal

READINESS				
	Goal #1: Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.	Goal # 2: Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.	Goal #3: Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.	Goal #4: Drive innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.
Product Readiness				
Create an inventory of all sites and buildings available, getting and maintaining up-to-date information	XX	X	X	
Prioritize sites and buildings based on priority projects and best business case within the value-chain.	XX	X	X	X
Understand and develop the product pipeline.	XX	X	X	
Advocate for infrastructure improvement where it enhances and supports the CV/AV industry and Union County's competitiveness.	XX	X	XX	X
Talent Readiness				
Identify existing and planned initiatives from all relevant groups.	XX	XXX	XX	XX
Determine talent needs from existing employers.	X	XXX	XX	X
Build a talent strategy around existing and future needs for talent.	XX	XXX	XX	XX
Innovation Readiness				
Identify and define current resources available for start-ups	X	X	X	XXX
Create awareness around current resources.	X	X	XX	XXX
Curate a uniquely branded program that showcases talent, opportunities, and entrepreneurial activity in Union County.	X	X	XX	XXX
Support and facilitate innovative touchpoints within the area.			X	XXX

XXX: Primary effect on goal **XX:** Direct effect on goal **X:** Indirect effect on goal

MARKETING/DIFFERENTIATION				
	Goal #1: Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.	Goal # 2: Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.	Goal #3: Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.	Goal #4: Drive innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.
Messaging-All Audiences				
Use data from economic development plan to identify points of differentiation and develop marketing collateral to communicate this.	X		XXX	
Narrative Building				
Develop marketing collateral based on the CV/AV industry and begin building the Union County narrative.	XX	X	XXX	
Leverage marketing presence and initiatives of Columbus 2020	XX		XX	
Develop a unified message that can be used by regional stakeholders to promote and sell the 33 Smart Mobility Corridor.	XX	X	XXX	X

XXX: Primary effect on goal **XX:** Direct effect on goal **X:** Indirect effect on goal

SECTION 2: INTRODUCTION & METHODOLOGY

BACKGROUND

Union County, Ohio is home to over 55,000 individuals. Located just 30 minutes from downtown Columbus, the area has access to major metropolitan amenities in addition to the advantages of a smaller community. It is located along US Highways 33 and 23, and has access to Interstates 70, 71, and 75.

Union County and the City of Marysville have a long history with the area's largest employer, Honda. The plant opened in 1979 originally as a motorcycle manufacturing location. A few short years later, Honda expanded the plant and built a new 1,000,000 square foot auto plant, and in 1982, the first Honda Accord rolled off the line. Through the years, the plant has built over 20,000,000 cars and produced nearly ten different models.

The presence of Honda in the region has cemented Union County and Marysville's relationship with Japan. Nearly a quarter of the jobs in the area are provided by Japanese-owned firms. This relationship was deepened further in 2013 with the declaration of friendship with the Town of Yorii, Japan.

Today, Union County-Marysville is home to 33 Smart Corridor, a 35 mile stretch of highway. The region is seeing an expansion of technology surrounding autonomous and connected vehicles, which will create an interstate highway test corridor for the advancement of research surrounding new and emerging automotive technology.

OBJECTIVES

The overarching objective of this engagement is to create economic development strategy focused on determining the optimal positioning for the 33 Smart Corridor and to make recommendations for marketing the 33 Smart Corridor.

To achieve this overarching objective, Ady will address the following types of sub-objective questions:

- What are key fundamentals of the CV/AV value chain? What criteria are necessary for each element?
- How does the 33 Smart Corridor rate on these criteria? In which area is it and how can it be most competitive? What gaps need to be addressed in order to be competitive in these areas?
- What are the key strategies and action items related to supporting the 33 Smart Corridor arising from the various initiatives? Which new strategies and action items are missing and need to be added? What does the integrated work plan look like in terms of tactics, timelines, and responsibilities?
- What funding may be available to support these activities, based on research with competing regions? What types of companies should be the focus of recruitment activities? What other outbound marketing activities are required to support the achievement of the overall objective?

Methodology

REGIONS

Throughout this report, the core region is defined as Union County. The greater region is referred to as Columbus metropolitan statistical area (MSA), which includes Union County. The comparison regions are Ann Arbor MSA, which encompasses only Washtenaw County, Michigan; and Las Vegas MSA, which encompasses only Clark County, Nevada. In addition, the states where Columbus, Ann Arbor and Las Vegas MSAs are located (Ohio, Michigan and Nevada, respectively) are compared in some analyses, as well as the entire United States. Ann Arbor MSA and Las Vegas MSA were selected as comparison regions due to the hypothesis that the CV-AV industry is prevalent in those regions and best practices could be gleaned from a more in-depth study of them. Several communities in the Netherlands were also of interest due to their CV-AV industry presence. However, the data sources used in US comparisons would not be available for the Netherlands and making true comparisons as well as identifying best practices would not be possible without adequate data.

ASSET MAPS

The key criteria site selectors use when determining if a place is ideal for business location were collected for the comparison regions listed above. These criteria were mapped on quadrants delineating their importance to the businesses decision and Union County's competitiveness (denoted with orange dots). Dots with a downward pointing arrow indicate there may be a difference in importance to the business decision (denoted as an orange dashed line) based on the industry that business exists within. Data to support these asset maps can be found in the report on tables following the asset maps, on tables within the talent assessment, within the text of the scorecards, as well as within the stakeholder and employer input and analysis section. In addition, an asset map specific to the assets of the CV-AV industry was included, with key criteria defined and supported through secondary and primary research conducted as part of this study.

SCORECARDS

The information found within the scorecard for Union County, Ohio, is a mixture of secondary research and primary research conducted both over the phone and during the onsite visit to the region in December 2017. The scorecards for Ann Arbor MSA and Las Vegas MSA are based solely on secondary research conducted on CV-AV industry.

SECTION 3: ASSESSMENT SCAN AND SCORECARDS

Section 3: Assessment Scan and Scorecards

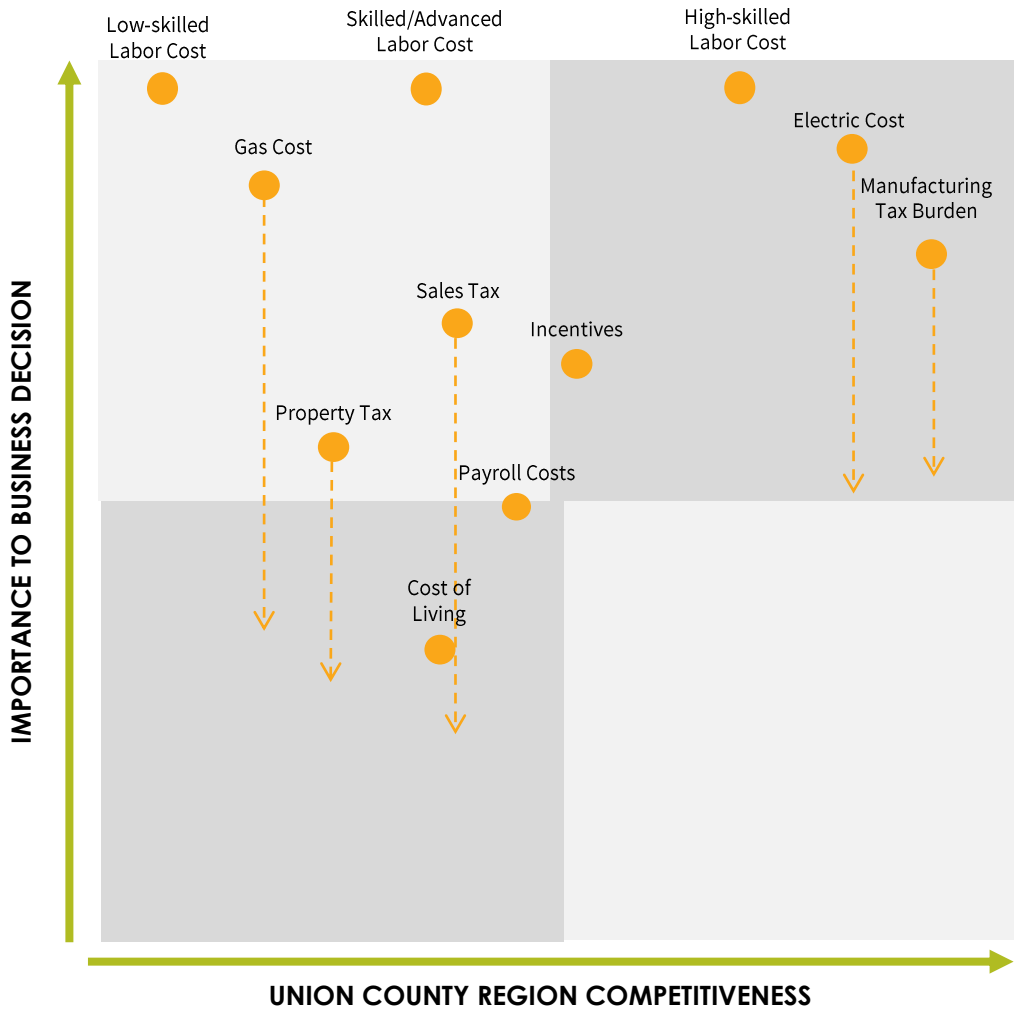
Core Economic Assets

GENERAL BUSINESS COSTS ASSET MAP COMMENTS

The asset map to the right depicts the Union County region's competitiveness compared to Ann Arbor MSA, Las Vegas MSA, the states of OH, MI and NV, as well as the United States as a whole.

- Labor costs in the Union County region are mixed. Low-skilled labor costs are higher than average compared to MSAs, states and the US. Skilled and advanced labor costs are higher in Columbus MSA than Las Vegas MSA, Ohio and Nevada, but competitive with Ann Arbor MSA, Michigan and the US average. High-skilled labor is higher in Columbus MSA than Ohio and Michigan, but competitive with all other regions. This is due to the data for Union County being part of the Columbus metropolitan statistical area. Higher wages can make the region less competitive for these professions.
- Out of all the competitor states, Ohio ranks in the top 10 for the tax burden for both new and mature capital intensive manufacturing. Ohio also ranks in the top ten for new labor intensive manufacturing and above average for mature labor intensive manufacturing (13th).
- Ohio has a competitive sales tax (5.75%) compared with Michigan (6.0%), and higher than Nevada (4.6%). Union County charges an additional sales taxes (1.25%) on top of the state sales tax, totaling 7.00%. Ohio also has a higher individual income tax (5.33%) than comparison states and levies a 0.25% gross receipts corporate income tax.
- Industrial electricity costs in Ohio are competitive compared with Michigan and the US, and slightly above Nevada's average. Industrial gas costs are much higher than the national average, and nearly the highest among comparison states, all of which are also above the national average.
- Ohio has an average unemployment tax rate (0.30-8.8%) relative to competitor states. Ohio has among the highest workers compensation costs (40th) in the US, but average among competitor states.
- The cost of living in Union County is 6% lower than the national average, as well as competitor MSAs. Union County's cost of living is higher than the Columbus MSA as a whole and higher than the Ohio average. The cost of living in Ohio is comparable to neighboring state of MI, and lower than NV.

GENERAL BUSINESS COSTS ASSET MAP

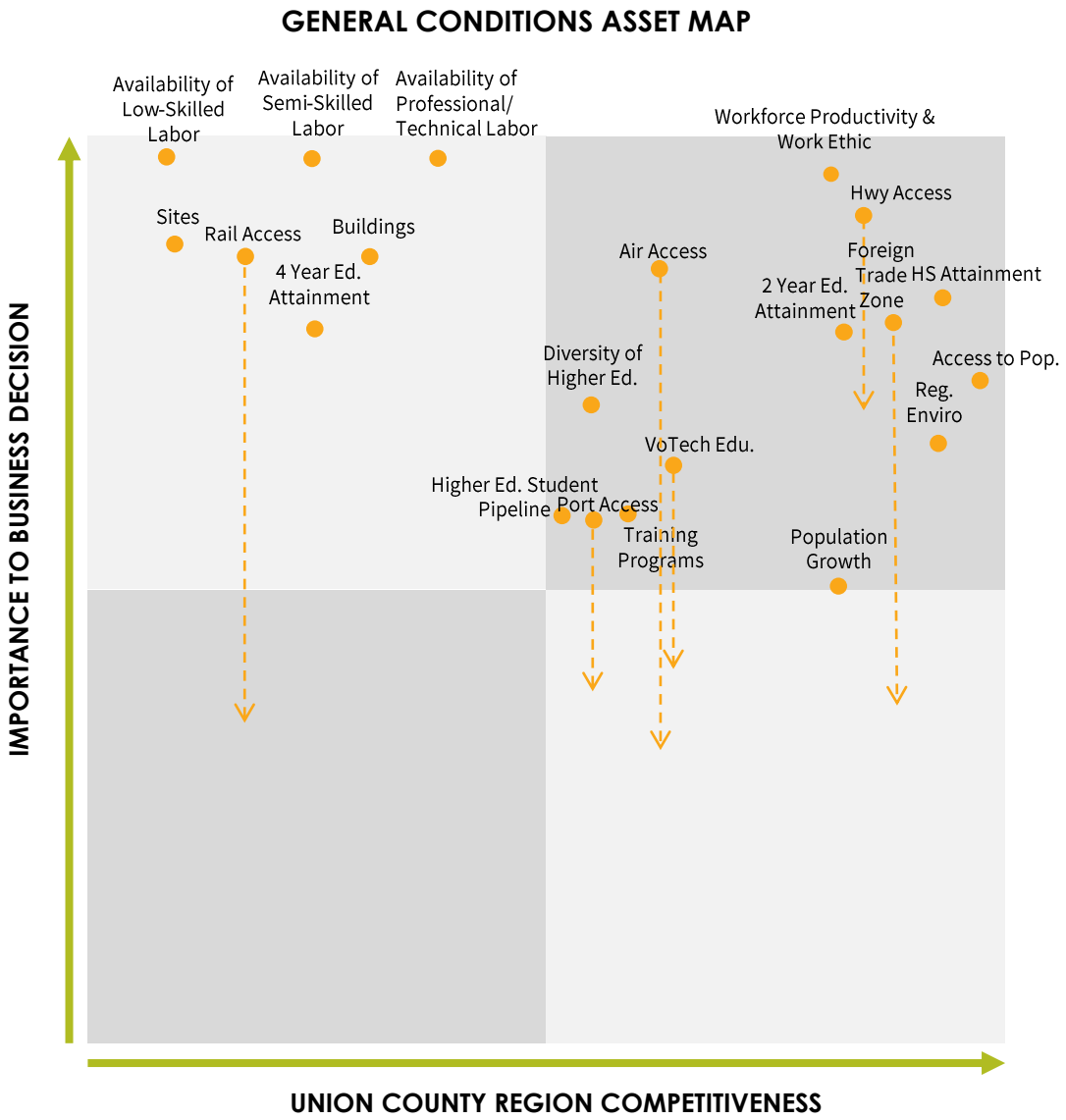


Core Economic Assets

GENERAL BUSINESS CONDITIONS ASSET MAP COMMENTS

The asset map to the right depicts the Union County region's competitiveness compared to Ann Arbor MSA, Las Vegas MSA, the states of OH, MI and NV, as well as the United States as a whole.

- The population growth in the region has been relatively high, with Union County experiencing growth of 6.0% since 2010. The state of Ohio has had very weak population growth of only 0.64% since 2010, compared to the national average 4.66%.
- Union County has a small regional airport to serve the immediate region. Access to Columbus's John Glenn International Airport, with freight capacity and 10 airline carriers, is available within the region.
- Recent efforts have been focused at improving Union County's educational attainment rates. Union County's average educational attainment rates are currently comparable with Ohio and national averages at all levels. Union County 4-year and graduate degree attainment rates are significantly lower than Ann Arbor MSAs. At a state level, Ohio's average educational attainment rates are comparable with MI and NV.
- Labor force growth in Union County was low (2.3%), while labor force growth of the Columbus MSA topped that of other MSAs (8.95%). Of the competitor states, Ohio had the lowest labor force growth, at -1.01%.
- Availability of labor was cited by employers as challenging, especially with low-skilled and semi-skilled/skilled labor. Employers noted less of a demand for professional/technical labor.
- Union County is within one days drive of more than one-third of the population of the US.
- Union County has access to one of the nation's highest concentrations of higher education pipeline opportunities in nearby Columbus, with 4-year degrees available from Ohio State University, as well as specialized trade skills training in Marysville from Columbus State Community College.
- Work ethic was cited by employers to be high. Many employers specified that their long-term workforce was of a good quality, especially in regards to productivity and low turnover.
- Union County has no water transportation access via port, with the closest port being located in Toledo. There is a Port Authority located in the county for the purposes of real estate development, financing and management of foreign trade zones. The county manages a foreign trade zone under the auspices of the port authority to allow duty-free and without formal customs entry of goods. However, Rickenbacker Intermodal is within an hour drive of Marysville, OH.



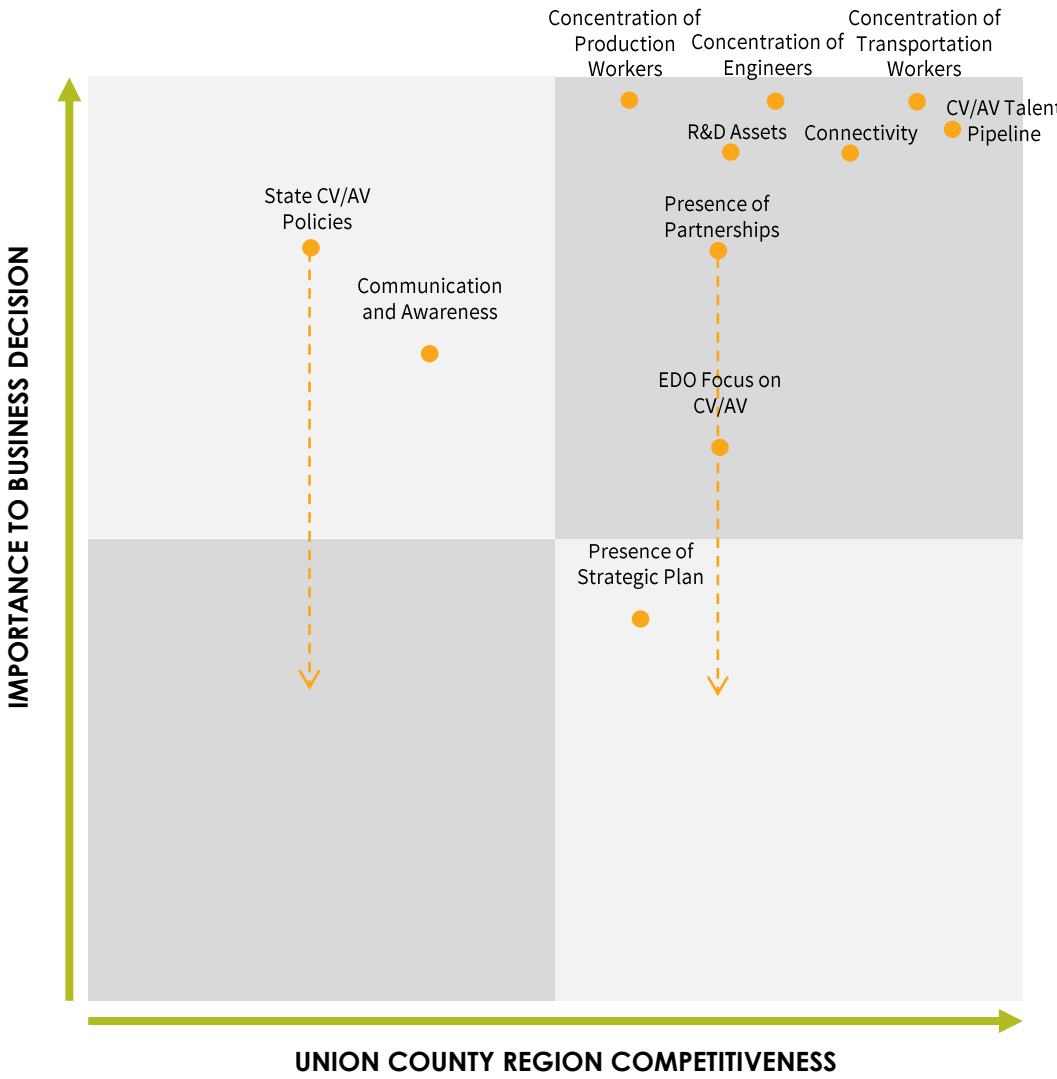
Core Economic Assets

CV/AV ASSET MAP COMMENTS

The asset map to the right depicts Union County region's competitiveness compared to Ann Arbor MSA, Las Vegas MSA, the states of OH, MI and NV, as well as the United States as a whole.

- The concentration of engineers relevant to the CV/AV industry in Union County is high as compared with other MSAs, with Ann Arbor MSA being the biggest competitor. On a state level, Michigan outpaces Ohio in concentration of most engineering disciplines.
- The concentration of production workers is much higher in Union County than all other MSAs for almost every occupation relevant to the CV/AV industry. At the state level, Michigan and Ohio are competitive and mixed, with some occupations having a higher concentration in one state than another.
- The talent pipelines within the Columbus and Ann Arbor regions are similar and competitive. At the community college level, the degree completions for CV/AV production and transportation occupations are higher in Ohio than Michigan. Ann Arbor MSA outpaces Columbus MSA for engineering occupations and seems to have more developed CV/AV-focused programs.
- R&D assets were most competitive for Columbus and Ann Arbor MSAs compared to Las Vegas MSA. All three had a mix of urban and highway research assets, but Columbus and Ann Arbor both had a mix of public and private research facilities. In addition, the presence of numerous OEMs in such close proximity to Ann Arbor that operate or are affiliated with regional research facilities is a major competitive advantage. The proximity of another major university (Michigan State University) contributing CV/AV-related R&D to the region is another competitive advantage.
- Communication and awareness of assets related to the CV/AV industry is an important factor in decision-making to businesses. While Las Vegas, NV, had relatively limited communication and organized distribution of messaging, Ann Arbor, MI was well developed. Union County has several messages and channels where its communication is distributed. It would be more beneficial to have more unified messaging along with better clarity, especially as it relates to the regulatory environment for the CV/AV industry.
- Marysville-Union County Port Authority and its related economic development organizations have been focusing on the CV/AV industry for some time. The focus enables the EDO to better understand the needs of CV/AV industries, and as a result, better facilitate an expansion or location project.
- While the presence of a strategic plan focused on the CV/AV industry may not be an important factor for businesses, it can provide significant advantages to the EDO that is working to attract from this industry. It creates a narrowly defined focus to develop assets, articulates the types of projects it will attract, and defines the steps needed to build an ecosystem to support that industry.

CV/AV ASSET MAP



Core Economic Assets

Table 3.1: Select Supporting Data for Business Costs Asset Map	Union County, OH	Columbus MSA	Ann Arbor MSA	Las Vegas MSA	Ohio	Michigan	Nevada	United States
Avg. Low-Skilled Labor Costs[1]		$39,190	$35,770	$35,540	$37,700	$37,520	$36,160	$37,190
Avg. Skilled/Advanced Labor Costs[1]		$94,190	$100,865	$90,470	$91,915	$95,750	$89,625	$101,160
Avg. Professional Technical Labor Cost[1]		$89,850	$112,080	$105,880	$85,440	$86,860	$106,220	$105,980
Tax Burden Ranking – Mature Labor Intensive Manufacturing[2]					13	10	15	
Tax Burden Ranking – New Labor Intensive Manufacturing[2]					9	20	45	
Tax Burden Ranking – Mature Capital Intensive Manufacturing[2]					8	15	13	
Tax Burden Ranking – New Capital Intensive Manufacturing[2]					6	29	48	
Sales Tax[2,3]	1.25%		0%	3.65%	5.75%	6.0%	4.6%	
Individual Income Tax[2]					5.333%	4.25%	0%	
Corporate Income Tax[2]					0%*	6.0%	0%	
Payroll Costs – Unemployment Tax[4] *(New Employer Base | Payroll Base)*					0.30 – 8.8% | $9,000	0.06 – 10.3% | $9,000	0.30 – 5.4% | $29,500	
Payroll Costs – Workers Comp.[5] *(State Rank | Avg. Rate per $100 of payroll)*					40 | $1.45	34 | $1.57	43 | $1.31	
Cost of Living[6]	94.00	90.80	107.40	104.70	88.40	88.30	104.10	100
Average Industrial Electric Costs (Cents per Kilowatt-hour)[7]					$6.71	$7.16	$5.90	$6.95
Average Industrial Gas Costs (Dollars per Thousand Cubic Feet)[7]					$5.83	$6.99**	$5.64	$3.82

Sources:
1. Bureau of Labor Statistics, May 2016
2. Tax Foundation, 2015 - *A gross receipts tax is levied in Ohio at a rate of 0.26% in lieu of a corporate income tax.
3. Ohio, Michigan and Nevada Department of Taxation websites, 2017 for Union, Washtenaw (Ann Arbor MSA) and Clark (Las Vegas MSA) County sales tax rates
4. ADP 2017 Payroll Tax Rates by State, 2017
5. Oregon Workers' Compensation Premium Rate Ranking Summary, 2016 (ranked from 1=highest to 51=lowest)
6. Sperling's Best Places, 2016
7. EIA.gov, October 2017 **Price is from Sept 2017

Core Economic Assets

Table 3.2: Select Supporting Data for Business Conditions Asset Map	Union County, OH	Columbus MSA	Ann Arbor MSA	Las Vegas MSA	Ohio	Michigan	Nevada	United States
Population[1]	55,457	2,041,520	364,709	2,155,664	11,614,373	9,928,300	2,940,058	323,127,153
Labor Availability[1]	27,340	1,076,696	191,860	1,048,043	5,713,088	4,836,760	1,427,114	
Population Growth *(Since 2010)*[1]	6.00%	7.08%	5.80%	10.50%	0.64%	0.51%	8.76%	4.66%
Labor Force Growth (2011-2015)[1]	2.30%	8.95%	6.10%	5.30%	-1.01%	3.24%	3.93%	
Access to Population[1] *(Population within 500 Miles of the County)*	131,026,744		99,147,918	53,937,794				
Population with High School Degree[2]	91.6%		94.3%	84.2%	88.8%	89.3%	84.9%	86.3%
Population with 2-Year Degree[2]	8.0%		6.9%	7.5%	8.1%	8.8%	7.6%	7.9%
Population with 4-Year Degree[2]	26.0%		51.8%	22.2%	25.6%	26.4%	22.5%	29.3%
Population with Graduate Degree[2]	8.1%		26.8%	7.5%	9.5%	10.3%	7.7%	10.1%

Sources:
1. Stats America, United States Census Bureau
2. Sperling's Best Places, 2016

Talent Assessment

COMPARISON OF WAGES BY OCCUPATION

The tables on the following pages show the median hourly wages of three primary occupation groups: engineering, production, and transportation and material moving occupations. The occupations listed in these groups were selected due to their importance to the CV/AV industry. The core region is defined as Union County, OH. The greater region is the Columbus metropolitan statistical area (MSA) which includes Union County, OH. The comparison MSAs are the Ann Arbor MSA, comprised solely of Washtenaw County, MI, and the Las Vegas MSA, comprised solely of Clark County, NV. The wages were also compared across states (Ohio, Michigan, and Nevada), as well as national wages.

For a majority of occupations, the core region's wages are higher when compared to the greater region, Ann Arbor MSA and Las Vegas MSA *(highlighted in red).* There were also many occupations in which the core region's wages were higher than all three comparison regions (*not highlighted).*

Only three occupations had wages lower in the core region that two of the comparison regions (*highlighted in yellow):*

- Computer-Controlled Machine Tool Operators, Metal and Plastic (SOC 51-4011)
- First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand (SOC 53-1021)
- Machine Feeders and Offbearers (SOC 53-7063)

At a state level, the following occupation wages in Ohio are lower when compared to Michigan, Nevada and the national average (*highlighted in green):*

- Electrical Engineers (SOC 17-2071)
- Industrial Engineers (SOC 17-2112)
- Mechanical Engineers (SOC 17-2141)
- Engineers, All Other (SOC 17-2199)
- Mechanical Engineering Technicians (SOC 17-3027)
- Engineering Technicians, Except Drafters, All Other (SOC 17-3029)
- Stationary Engineers and Boiler Operators (SOC 51-8021)
- Laborers and Freight, Stock, and Material Movers, Hand (SOC 53-7062)
- Machine Feeders and Offbearers (SOC 53-7063)

Lower wages can be used to attract new businesses, which ostensibly creates more demand for those workers resulting in increased wages over time.

Talent Analysis: Engineering Occupation Wage Comparison

Table 3.3.A: Engineering Occupation Wage Comparison	Union County, OH Median Hourly Wage	Columbus MSA Median Hourly Wage	Ann Arbor MSA Median Hourly Wage	Las Vegas MSA Median Hourly Wage
Electrical Engineers (SOC 17-2071)	$43.89	$39.70	$42.26	$43.32
Industrial Engineers (SOC 17-2112)	$38.65	$36.73	$39.76	$38.59
Mechanical Engineers (SOC 17-2141)	$41.66	$37.99	$38.47	$44.05
Engineers, All Other (SOC 17-2199)	$44.57	$41.69	$40.57	$46.83
Mechanical Drafters (SOC 17-3013)	$25.83	$23.31	$29.48	$21.30
Electrical and Electronics Engineering Technicians (SOC 17-3023)	$32.22	$29.66	$25.65	$33.22
Industrial Engineering Technicians (SOC 17-3026)	$27.94	$26.01	$23.63	$26.51
Mechanical Engineering Technicians (SOC 17-3027)	$28.98	$26.13	$21.70	$22.93
Engineering Technicians, Except Drafters, All Other (SOC 17-3029)	$28.47	$25.77	$27.02	$36.24

Source: Emsi 2017 – Columbus 2020

Core Region wages < Greater Region, Ann Arbor MSA and Las Vegas MSA wages

Core Region wages > Two of the three comparison region wages

Core Region wages < Two of three of the comparison region wages

Core Region wages > Greater Region, Ann Arbor MSA and Las Vegas MSA wages

Talent Analysis: Engineering Occupation Wage Comparison

Table 3.3.B: Engineering Occupation Wage Comparison	Ohio Median Hourly Wage	Michigan Median Hourly Wage	Nevada Median Hourly Wage	United States Median Hourly Wage
Electrical Engineers (SOC 17-2071)	$38.70	$41.33	$42.54	$45.29
Industrial Engineers (SOC 17-2112)	$37.95	$40.95	$39.42	$40.53
Mechanical Engineers (SOC 17-2141)	$36.09	$41.61	$39.22	$40.48
Engineers, All Other (SOC 17-2199)	$41.94	$42.77	$48.33	$46.78
Mechanical Drafters (SOC 17-3013)	$25.03	$26.77	$20.20	$26.19
Electrical and Electronics Engineering Technicians (SOC 17-3023)	$27.96	$26.27	$33.02	$29.90
Industrial Engineering Technicians (SOC 17-3026)	$25.37	$23.23	$22.94	$25.64
Mechanical Engineering Technicians (SOC 17-3027)	$23.56	$27.29	$25.15	$26.19
Engineering Technicians, Except Drafters, All Other (SOC 17-3029)	$25.76	$28.24	$31.03	$29.96

Source: Emsi 2017 – Columbus 2020

Ohio wages < Michigan, Nevada and U.S. wages

Ohio wages > Two of three of the comparison region wages

Ohio wages < Two of three of the comparison region wages

Talent Analysis: Production Occupation Wage Comparison

Table 3.3.C: Production Occupation Wage Comparison	Union County, OH Median Hourly Wage	Columbus MSA Median Hourly Wage	Ann Arbor MSA Median Hourly Wage	Las Vegas MSA Median Hourly Wage
First-Line Supervisors of Production and Operating Workers (SOC 51-1011)	$29.06	$27.91	$28.45	$24.52
Electrical and Electronic Equipment Assemblers (SOC 51-2022)	$17.07	$15.30	$15.48	$16.86
Team Assemblers (SOC 51-2092)	$18.63	$18.31	$14.67	$12.64
Assemblers and Fabricators, All Other (SOC 51-2099)	$16.66	$15.36	$15.15	$14.09
Computer-Controlled Machine Tool Operators, Metal and Plastic (SOC 51-4011)	$18.98	$17.02	$22.85	$19.15
Forging Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4022)	$17.14	$16.89	$14.02	$18.31
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4031)	$16.97	$15.86	$13.84	$13.30
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4033)	$15.31	$13.72	$13.76	$13.39
Machinists (SOC 51-4041)	$20.52	$18.44	$20.45	$19.60
Model Makers, Metal and Plastic (SOC 51-4061)	Insf. Data	$25.00	$20.85	Insf. Data
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4072)	$16.73	$15.19	$13.38	$13.91
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4081)	$17.85	$17.06	$16.87	$13.30
Tool and Die Makers (SOC 51-4111)	$25.22	$22.61	$27.08	$24.56
Welders, Cutters, Solderers, and Brazers (SOC 51-4121)	$20.21	$18.99	$17.54	$24.59
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (SOC 51-4122)	$21.65	$20.87	$15.15	$16.27
Stationary Engineers and Boiler Operators (SOC 51-8021)	Insf. Data	$24.79	$26.39	$29.26
Inspectors, Testers, Sorters, Samplers, and Weighers (SOC 51-9061)	$19.11	$18.26	$14.54	$16.47
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders (SOC 51-9121)	$16.45	$15.62	$14.11	$14.46
Painters, Transportation Equipment (SOC 51-9122)	$25.36	$25.51	$23.49	$17.38
Helpers--Production Workers (SOC 51-9198)	$15.43	$13.84	$12.59	$11.35
Production Workers, All Other (SOC 51-9199)	$17.08	$15.95	$10.91	$15.85

Source: Emsi 2017 – Columbus 2020

Core Region wages < Greater Region, Ann Arbor MSA and Las Vegas MSA wages

Core Region wages > Two of three of the comparison region wages

Core Region wages < Two of three of the comparison region wages

Talent Analysis: Production Occupation Wage Comparison

Table 3.3.D: Production Occupation Wage Comparison	Ohio Median Hourly Wage	Michigan Median Hourly Wage	Nevada Median Hourly Wage	United States Median Hourly Wage
First-Line Supervisors of Production and Operating Workers (SOC 51-1011)	$27.52	$28.63	$26.40	$27.78
Electrical and Electronic Equipment Assemblers (SOC 51-2022)	$15.04	$13.59	$15.57	$15.06
Team Assemblers (SOC 51-2092)	$15.18	$15.41	$12.30	$14.45
Assemblers and Fabricators, All Other (SOC 51-2099)	$14.57	$12.14	$13.89	$13.73
Computer-Controlled Machine Tool Operators, Metal and Plastic (SOC 51-4011)	$18.57	$16.96	$18.49	$18.21
Forging Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4022)	$18.69	$14.52	$9.61	$17.76
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4031)	$15.66	$14.88	$14.49	$15.56
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4033)	$15.09	$15.75	$13.95	$15.81
Machinists (SOC 51-4041)	$19.82	$19.19	$18.94	$20.05
Model Makers, Metal and Plastic (SOC 51-4061)	$24.04	$32.72	$12.76	$23.34
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4072)	$14.77	$13.97	$14.06	$14.65
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4081)	$16.21	$16.25	$13.38	$16.51
Tool and Die Makers (SOC 51-4111)	$24.81	$24.94	$24.65	$24.55
Welders, Cutters, Solderers, and Brazers (SOC 51-4121)	$18.17	$17.50	$22.63	$18.94
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (SOC 51-4122)	$18.65	$17.06	$17.92	$17.78
Stationary Engineers and Boiler Operators (SOC 51-8021)	$25.95	$32.21	$29.14	$28.56
Inspectors, Testers, Sorters, Samplers, and Weighers (SOC 51-9061)	$17.89	$15.35	$16.88	$17.68
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders (SOC 51-9121)	$16.03	$13.82	$15.38	$15.76
Painters, Transportation Equipment (SOC 51-9122)	$21.40	$19.49	$17.58	$20.27
Helpers--Production Workers (SOC 51-9198)	$13.64	$11.42	$11.56	$11.94
Production Workers, All Other (SOC 51-9199)	$15.72	$16.47	$14.17	$13.83

Source: Emsi 2017 – Columbus 2020

Ohio wages < Michigan, Nevada and U.S. wages
Ohio wages > Two of three of the comparison region wages
Ohio wages < Two of three of the comparison region wages
Ohio wages > Michigan, Nevada and U.S. wages

Talent Analysis: Transportation Occupation Wage Comparison

Table 3.3.E: Transportation Occupation Wage Comparison	Union County, OH Median Hourly Wage	Columbus MSA Median Hourly Wage	Ann Arbor MSA Median Hourly Wage	Las Vegas MSA Median Hourly Wage
First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand (SOC 53-1021)	$23.55	$23.60	$25.15	$20.19
Heavy and Tractor-Trailer Truck Drivers (SOC 53-3032)	$23.95	$22.37	$19.01	$23.44
Industrial Truck and Tractor Operators (SOC 53-7051)	$15.35	$14.87	$13.71	$19.24
Laborers and Freight, Stock, and Material Movers, Hand (SOC 53-7062)	$12.64	$11.83	$11.45	$12.87
Machine Feeders and Offbearers (SOC 53-7063)	$11.08	$10.81	$15.00	$16.53

Source: Emsi 2017 – Columbus 2020

Core Region wages < Greater Region, Ann Arbor MSA and Las Vegas MSA wages

Core Region wages > Two of three of the comparison region wages

Core Region wages < Two of three of the comparison region wages

Core Region wages > Greater Region, Ann Arbor MSA and Las Vegas MSA wages

Talent Analysis: Transportation Occupation Wage Comparison

Table 3.3.F: Transportation Occupation Wage Comparison	Ohio Median Hourly Wage	Michigan Median Hourly Wage	Nevada Median Hourly Wage	United States Median Hourly Wage
First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand (SOC 53-1021)	$22.81	$23.55	$21.14	$22.71
Heavy and Tractor-Trailer Truck Drivers (SOC 53-3032)	$20.07	$19.07	$23.55	$19.87
Industrial Truck and Tractor Operators (SOC 53-7051)	$15.45	$15.07	$17.78	$15.61
Laborers and Freight, Stock, and Material Movers, Hand (SOC 53-7062)	$12.26	$12.76	$13.02	$12.49
Machine Feeders and Offbearers (SOC 53-7063)	$11.62	$15.12	$18.69	$13.66

Source: Emsi 2017 – Columbus 2020

Ohio wages < Michigan, Nevada and U.S. wages

Ohio wages > Two of three of the comparison region wages

Ohio wages < Two of three of the comparison region wages

COMPARISON OF OCCUPATION CONCENTRATION

The tables on the following pages show the concentration of each occupation within the core region, the greater region, comparison MSAs, the State of Ohio, and comparison states. A location quotient of 1.2 was used to indicate a significant concentration of that occupation (*highlighted in green).*

Union County has a strong concentration in a majority of the occupations in all three groups (engineering, production and transportation and material moving). It is instructive to look at the comparison of MSAs and among states to see where competitive advantages lie.

Comparison MSAs have a higher concentration of the following occupations than the Columbus MSA:

- Industrial Engineers (SOC 17-2112)
- Engineers, All Other (SOC 17-2199)
- Electrical and Electronics Engineering Technicians (SOC 17-3023)
- Industrial Engineering Technicians (SOC 17-3026)
- Mechanical Engineering Technicians (SOC 17-3027)
- Team Assemblers (SOC 51-2092)
- Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4031)
- Model Makers, Metal and Plastic (SOC 51-4061)

Comparison states have a higher concentration of the following occupations than the state of Ohio:

- Electrical Engineers (SOC 17-2071)
- Mechanical Drafters (SOC 17-3013)
- Electrical and Electronics Engineering Technicians (SOC 17-3023)
- Team Assemblers (SOC 51-2092)
- Helpers--Production Workers (SOC 51-9198)

Talent Analysis: Engineering Occupation Concentration Comparison

Table 3.4.A: Engineering Occupation Concentration Comparison	Union County, OH Location Quotient	Columbus MSA Location Quotient	Ann Arbor MSA Location Quotient	Las Vegas MSA Location Quotient
Electrical Engineers (SOC 17-2071)	2.02	0.84	0.80	0.39
Industrial Engineers (SOC 17-2112)	4.07	1.01	5.48	0.17
Mechanical Engineers (SOC 17-2141)	7.04	2.18	2.16	0.16
Engineers, All Other (SOC 17-2199)	2.69	0.95	1.48	0.51
Mechanical Drafters (SOC 17-3013)	0.90	0.46	0.36	0.32
Electrical and Electronics Engineering Technicians (SOC 17-3023)	1.00	0.62	0.67	1.22
Industrial Engineering Technicians (SOC 17-3026)	2.87	0.90	2.09	0.11
Mechanical Engineering Technicians (SOC 17-3027)	3.08	1.12	1.47	0.27
Engineering Technicians, Except Drafters, All Other (SOC 17-3029)	3.43	1.54	0.96	0.33

Source: Emsi 2017 – Columbus 2020

LQ ≥ 1.2

Talent Analysis: Engineering Occupation Concentration Comparison

Table 3.4.B: Engineering Occupation Concentration Comparison	Ohio Location Quotient	Michigan Location Quotient	Nevada Location Quotient
Electrical Engineers (SOC 17-2071)	0.89	1.75	0.44
Industrial Engineers (SOC 17-2112)	1.52	3.42	0.23
Mechanical Engineers (SOC 17-2141)	1.39	4.82	0.28
Engineers, All Other (SOC 17-2199)	1.45	1.92	0.55
Mechanical Drafters (SOC 17-3013)	1.02	2.22	0.45
Electrical and Electronics Engineering Technicians (SOC 17-3023)	0.50	0.79	1.23
Industrial Engineering Technicians (SOC 17-3026)	1.33	2.46	0.25
Mechanical Engineering Technicians (SOC 17-3027)	1.30	3.19	0.43
Engineering Technicians, Except Drafters, All Other (SOC 17-3029)	1.14	1.04	0.58

Source: Emsi 2017 – Columbus 2020

LQ ≥ 1.2

Talent Analysis: Production Occupation Concentration Comparison

Table 3.4.C: Production Occupation Concentration Comparison	Union County, OH Location Quotient	Columbus MSA Location Quotient	Ann Arbor MSA Location Quotient	Las Vegas MSA Location Quotient
First-Line Supervisors of Production and Operating Workers (SOC 51-1011)	2.51	0.80	0.67	0.36
Electrical and Electronic Equipment Assemblers (SOC 51-2022)	0.94	0.77	0.40	0.18
Team Assemblers (SOC 51-2092)	9.92	0.82	1.72	0.29
Assemblers and Fabricators, All Other (SOC 51-2099)	8.37	2.52	0.56	0.50
Computer-Controlled Machine Tool Operators, Metal and Plastic (SOC 51-4011)	1.27	0.48	0.27	0.45
Forging Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4022)	6.63	0.78	1.14	0.10
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4031)	3.52	1.06	2.49	0.32
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4033)	2.43	0.95	0.75	0.28
Machinists (SOC 51-4041)	2.64	0.68	1.16	0.10
Model Makers, Metal and Plastic (SOC 51-4061)	3.53	0.83	1.45	0.17
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4072)	5.63	2.25	2.09	0.19
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4081)	2.69	0.73	1.12	0.11
Tool and Die Makers (SOC 51-4111)	5.13	0.78	1.05	0.12
Welders, Cutters, Solderers, and Brazers (SOC 51-4121)	1.37	0.73	0.35	0.32
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (SOC 51-4122)	6.04	1.63	0.35	0.42
Stationary Engineers and Boiler Operators (SOC 51-8021)	1.05	0.66	0.83	0.28
Inspectors, Testers, Sorters, Samplers, and Weighers (SOC 51-9061)	3.08	1.24	0.96	0.43
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders (SOC 51-9121)	1.92	1.21	0.52	0.21
Painters, Transportation Equipment (SOC 51-9122)	12.19	1.69	0.66	0.59
Helpers--Production Workers (SOC 51-9198)	1.48	0.66	0.47	0.26
Production Workers, All Other (SOC 51-9199)	4.09	0.93	0.21	0.23

Source: Emsi 2017 – Columbus 2020

LQ ≥ 1.2

Talent Analysis: Production Occupation Concentration Comparison

Table 3.4.C: Production Occupation Concentration Comparison	Ohio Location Quotient	Michigan Location Quotient	Nevada Location Quotient
First-Line Supervisors of Production and Operating Workers (SOC 51-1011)	1.33	1.50	0.47
Electrical and Electronic Equipment Assemblers (SOC 51-2022)	1.20	1.52	0.39
Team Assemblers (SOC 51-2092)	1.01	3.17	0.46
Assemblers and Fabricators, All Other (SOC 51-2099)	3.41	0.65	0.55
Computer-Controlled Machine Tool Operators, Metal and Plastic (SOC 51-4011)	2.46	2.34	0.60
Forging Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4022)	1.42	2.40	0.16
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4031)	2.45	3.19	0.54
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4033)	2.44	2.09	0.34
Machinists (SOC 51-4041)	1.90	2.30	0.20
Model Makers, Metal and Plastic (SOC 51-4061)	1.82	5.72	0.25
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4072)	2.89	3.23	0.35
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4081)	3.14	2.31	0.17
Tool and Die Makers (SOC 51-4111)	2.86	5.86	0.17
Welders, Cutters, Solderers, and Brazers (SOC 51-4121)	1.22	1.07	0.49
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (SOC 51-4122)	1.69	2.23	0.45
Stationary Engineers and Boiler Operators (SOC 51-8021)	0.80	0.88	0.37
Inspectors, Testers, Sorters, Samplers, and Weighers (SOC 51-9061)	1.59	1.72	0.54
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders (SOC 51-9121)	1.96	1.43	0.31
Painters, Transportation Equipment (SOC 51-9122)	1.21	0.88	0.65
Helpers--Production Workers (SOC 51-9198)	1.14	1.56	0.36
Production Workers, All Other (SOC 51-9199)	1.82	1.02	0.35

Source: Emsi 2017 – Columbus 2020

LQ ≥ 1.2

Talent Analysis: Transportation Occupation Concentration Comparison

Table 3.4.D: Transportation Occupation Wage Comparison	Union County, OH Location Quotient	Columbus MSA Location Quotient	Ann Arbor MSA Location Quotient	Las Vegas MSA Location Quotient
First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand (SOC 53-1021)	1.12	1.18	0.71	1.07
Heavy and Tractor-Trailer Truck Drivers (SOC 53-3032)	0.76	0.99	0.38	0.42
Industrial Truck and Tractor Operators (SOC 53-7051)	1.45	1.06	0.37	0.34
Laborers and Freight, Stock, and Material Movers, Hand (SOC 53-7062)	2.16	1.43	0.64	1.02
Machine Feeders and Offbearers (SOC 53-7063)	2.03	1.59	0.17	0.75

Source: Emsi 2017 – Columbus 2020

LQ ≥ 1.2

Talent Analysis: Transportation Occupation Concentration Comparison

Table 3.4.E: Transportation Occupation Wage Comparison	Ohio Location Quotient	Michigan Location Quotient	Nevada Location Quotient
First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand (SOC 53-1021)	1.01	0.94	1.15
Heavy and Tractor-Trailer Truck Drivers (SOC 53-3032)	1.10	1.04	0.69
Industrial Truck and Tractor Operators (SOC 53-7051)	1.07	1.02	0.48
Laborers and Freight, Stock, and Material Movers, Hand (SOC 53-7062)	1.14	0.92	1.13
Machine Feeders and Offbearers (SOC 53-7063)	1.20	0.57	0.73

Source: Emsi 2017 – Columbus 2020

LQ ≥ 1.2

COMPARISON OF REGIONAL COMPLETIONS

Completions of degree certificates (including dual degrees) of all award levels by occupation from all the colleges located within each region can be found in the tables on the following pages.

Columbus MSA has the most degree completions total from the production and transportation occupation groups than comparison MSAs, and lags behind only Ann Arbor MSA for engineering occupation degree completions in the region. Some of the occupations that Columbus MSA lags behind other MSAs in degree completions are the following:

- Industrial Engineers (SOC 17-2112)
- Mechanical Engineers (SOC 17-2141)
- Engineers, All Other (SOC 17-2199)
- Industrial Engineering Technicians (SOC 17-3026)
- Mechanical Engineering Technicians (SOC 17-3027)
- Electrical and Electronic Equipment Assemblers (SOC 51-2022)
- Welders, Cutters, Solderers, and Brazers (SOC 51-4121)
- Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (SOC 51-4122)
- Inspectors, Testers, Sorters, Samplers, and Weighers (SOC 51-9061)
- Painters, Transportation Equipment (SOC 51-9122)

Ohio has the most degree completions total from all occupation groups than either Michigan or Nevada. However, some of the occupations that Ohio lags behind other states in degree completions are the following:

- Industrial Engineers (SOC 17-2112)
- Mechanical Engineers (SOC 17-2141)
- Mechanical Drafters (SOC 17-3013)
- Industrial Engineering Technicians (SOC 17-3026)
- Engineering Technicians, Except Drafters, All Other (SOC 17-3029)
- Electrical and Electronic Equipment Assemblers (SOC 51-2022)
- Computer-Controlled Machine Tool Operators, Metal and Plastic (SOC 51-4011)
- Forging Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4022)
- Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4031)
- Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4033)
- Machinists (SOC 51-4041)
- Model Makers, Metal and Plastic (SOC 51-4061)
- Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4081)
- Tool and Die Makers (SOC 51-4111)
- Inspectors, Testers, Sorters, Samplers, and Weighers (SOC 51-9061)

Talent Analysis: Engineering Occupation Regional Completions Comparison

Table 3.5.A: Engineering Occupation Regional Completions Comparison	Columbus MSA Regional Completions (2015)	Ann Arbor MSA Regional Completions (2015)	Las Vegas MSA Regional Completions (2015)
Total Completions per Region	**1,211**	**1,627**	**219**
Electrical Engineers (SOC 17-2071)	382	347	38
Industrial Engineers (SOC 17-2112)	172	319	0
Mechanical Engineers (SOC 17-2141)	333	390	66
Engineers, All Other (SOC 17-2199)	104	210	7
Mechanical Drafters (SOC 17-3013)	0	0	0
Electrical and Electronics Engineering Technicians (SOC 17-3023)	119	30	98
Industrial Engineering Technicians (SOC 17-3026)	11	276	1
Mechanical Engineering Technicians (SOC 17-3027)	16	42	3
Engineering Technicians, Except Drafters, All Other (SOC 17-3029)	74	13	6

Source: Emsi 2017 – Columbus 2020

Talent Analysis: Engineering Occupation Regional Completions Comparison

Table 3.5.B: Engineering Occupation Regional Completions Comparison	Ohio Regional Completions (2015)	Michigan Regional Completions (2015)	Nevada Regional Completions (2015)
Total Completions per Region	**7,371**	**7,214**	**474**
Electrical Engineers (SOC 17-2071)	1,400	1,211	88
Industrial Engineers (SOC 17-2112)	467	839	2
Mechanical Engineers (SOC 17-2141)	1,639	1,711	172
Engineers, All Other (SOC 17-2199)	801	778	36
Mechanical Drafters (SOC 17-3013)	23	121	0
Electrical and Electronics Engineering Technicians (SOC 17-3023)	1,154	661	114
Industrial Engineering Technicians (SOC 17-3026)	758	941	10
Mechanical Engineering Technicians (SOC 17-3027)	631	357	3
Engineering Technicians, Except Drafters, All Other (SOC 17-3029)	498	595	49

Source: Emsi 2017 – Columbus 2020

Talent Analysis: Production Occupation Regional Completions Comparison

Table 3.5.C: Production Occupation Regional Completion Comparison	Columbus MSA Regional Completions (2015)	Ann Arbor MSA Regional Completions (2015)	Las Vegas MSA Regional Completions (2015)
Total Completions per Region	**658**	**568**	**106**
First-Line Supervisors of Production and Operating Workers (SOC 51-1011)	201	0	0
Electrical and Electronic Equipment Assemblers (SOC 51-2022)	0	2	0
Team Assemblers (SOC 51-2092)	0	0	0
Assemblers and Fabricators, All Other (SOC 51-2099)	0	0	0
Computer-Controlled Machine Tool Operators, Metal and Plastic (SOC 51-4011)	2	0	0
Forging Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4022)	0	0	0
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4031)	7	0	2
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4033)	0	0	0
Machinists (SOC 51-4041)	0	0	0
Model Makers, Metal and Plastic (SOC 51-4061)	7	0	2
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4072)	0	0	0
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4081)	0	0	0
Tool and Die Makers (SOC 51-4111)	0	0	0
Welders, Cutters, Solderers, and Brazers (SOC 51-4121)	53	68	15
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (SOC 51-4122)	53	68	15
Stationary Engineers and Boiler Operators (SOC 51-8021)	534	390	66
Inspectors, Testers, Sorters, Samplers, and Weighers (SOC 51-9061)	2	18	0
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders (SOC 51-9121)	0	0	0
Painters, Transportation Equipment (SOC 51-9122)	0	22	6
Helpers--Production Workers (SOC 51-9198)	0	0	0
Production Workers, All Other (SOC 51-9199)	0	0	0

Source: Emsi 2017 – Columbus 2020

Talent Analysis: Production Occupation Regional Completions Comparison

Table 3.5.D: Production Occupation Regional Completions Comparison	Ohio Regional Completions (2015)	Michigan Regional Completions (2015)	Nevada Regional Completions (2015)
Total Completions per Region	**5,410**	**3,749**	**988**
First-Line Supervisors of Production and Operating Workers (SOC 51-1011)	543	220	0
Electrical and Electronic Equipment Assemblers (SOC 51-2022)	30	38	19
Team Assemblers (SOC 51-2092)	0	0	0
Assemblers and Fabricators, All Other (SOC 51-2099)	0	0	0
Computer-Controlled Machine Tool Operators, Metal and Plastic (SOC 51-4011)	59	92	4
Forging Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4022)	83	100	58
Cutting, Punching, and Press Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4031)	90	119	60
Grinding, Lapping, Polishing, and Buffing Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4033)	98	135	58
Machinists (SOC 51-4041)	98	135	58
Model Makers, Metal and Plastic (SOC 51-4061)	7	19	2
Molding, Coremaking, and Casting Machine Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4072)	0	0	0
Multiple Machine Tool Setters, Operators, and Tenders, Metal and Plastic (SOC 51-4081)	98	135	58
Tool and Die Makers (SOC 51-4111)	15	16	0
Welders, Cutters, Solderers, and Brazers (SOC 51-4121)	1,244	434	251
Welding, Soldering, and Brazing Machine Setters, Operators, and Tenders (SOC 51-4122)	1,231	432	242
Stationary Engineers and Boiler Operators (SOC 51-8021)	2,182	1,919	172
Inspectors, Testers, Sorters, Samplers, and Weighers (SOC 51-9061)	29	95	0
Coating, Painting, and Spraying Machine Setters, Operators, and Tenders (SOC 51-9121)	0	0	0
Painters, Transportation Equipment (SOC 51-9122)	146	80	6
Helpers--Production Workers (SOC 51-9198)	0	0	0
Production Workers, All Other (SOC 51-9199)	0	0	0

Source: Emsi 2017 – Columbus 2020

Talent Analysis: Transportation Occupation Regional Completions Comparison

Table 3.5.E: Transportation Occupation Regional Completions Comparison	Columbus MSA Regional Completions (2015)	Ann Arbor MSA Regional Completions (2015)	Las Vegas MSA Regional Completions (2015)
Total Completions per Region	**228**	**0**	**0**
First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand (SOC 53-1021)	201	0	0
Heavy and Tractor-Trailer Truck Drivers (SOC 53-3032)	27	0	0
Industrial Truck and Tractor Operators (SOC 53-7051)	0	0	0
Laborers and Freight, Stock, and Material Movers, Hand (SOC 53-7062)	0	0	0
Machine Feeders and Offbearers (SOC 53-7063)	0	0	0

Source: Emsi 2017 – Columbus 2020

Talent Analysis: Transportation Occupation Regional Completions Comparison

Table 3.5.F: Transportation Occupation Regional Completions Comparison	Ohio Regional Completions (2015)	Michigan Regional Completions (2015)	Nevada Regional Completions (2015)
Total Completions per Region	**1,568**	**266**	**0**
First-Line Supervisors of Helpers, Laborers, and Material Movers, Hand (SOC 53-1021)	543	220	0
Heavy and Tractor-Trailer Truck Drivers (SOC 53-3032)	1,025	46	0
Industrial Truck and Tractor Operators (SOC 53-7051)	0	0	0
Laborers and Freight, Stock, and Material Movers, Hand (SOC 53-7062)	0	0	0
Machine Feeders and Offbearers (SOC 53-7063)	0	0	0

Source: Emsi 2017 – Columbus 2020

Marysville, OH, Scorecard

Scorecard for Union County – Marysville, OH

LABOR AND TALENT

Availability of Low-Skilled Labor

Stakeholders and employers noted a talent shortage of general labor in the region. Employers noted most of their labor having a high school degree, and entry-level positions being the most challenging positions to fill. The concentration of production employees is much higher within Union County than the rest of the Columbus MSA, further indicating that there is little possibility of drawing these types of employees from the greater region to meet demand. Employers are paying a premium for this type of labor, as average wages are greater in Columbus MSA and Ohio than the national average.

Availability of Semi-Skilled/Skilled Labor

Employers noted less of a need for people with technical degrees and Columbus State Community College offers a local pipeline to a variety of technical positions, including automotive technology. However, stakeholders and employers noted the need for skilled labor with specific types of degrees, primarily mechanical and other engineering, IT, research scientists, electricians, and managers/supervisors. Future needs for cybersecurity and data analytics skills are in high demand. Ohio State University offers a local pipeline to most of this talent, but Union County struggles to compete to gain and retain this type of talent. Wages in the Columbus MSA are higher on average than the rest of Ohio, but lower than the national average.

Availability of Professional/Technical Labor

Professional and technical labor was not noted to have supply and demand issues within the region. However, Columbus MSA has the lowest wages of any MSA and Ohio has the lowest wages of any state, limiting it's ability to attract and retain this type of talent.

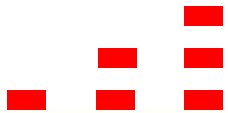
Training Programs

The Ohio State University utilizes its Center for Automotive Research as a training ground for undergraduates and graduate students primarily in mechanical and aerospace engineering, but also in a variety of other academic disciplines. Graduate students in mechanical engineering delve deeper into coursework and research on advanced automotive systems, including smart materials, structures and manufacturing. They also offer a certificate program for professionals to advance their knowledge of the automotive industry. Both Honda and Transportation Research Center offer competitive internships, and Ohio State University could leverage its industry partnerships to provide additional practical learning opportunities as well. In addition, Columbus State Community College provides certificates and 2-year degrees in Automotive Technology. On a K-12 level, multiple opportunities are offered for students to engage in STEM learning.

Education

Union County's educational attainment rate is slightly higher than the Ohio average, as well as competitor area Clark County , NV. Union County also has a slightly higher percentage of all educational attainment rates than Clark County, NV, as well as 4-year degree recipients than the state average in Ohio.

Marginally Competitive
Competitive
Very Competitive



Marginally Disadvantaged
Disadvantaged
Significantly Disadvantaged

Neutral

Scorecard for Union County – Marysville, OH (continued)

INFRASTRUCTURE

Highway

Three US highways run through Union County. US Hwy 33 wraps around Marysville and extends through Columbus to rural West Virginia in the southeast, and to Elkhart near South Bend, IN, in the northwest. US Hwy 36 joins Hwy 33 in the Marysville area, and extends west just past Denver, CO, and east to rural Ohio, south of Akron. These roadways connect the region to more than 131 million people (45% of the US population and within a days drive, due in large part to the interstate connections in and around Columbus. However, there are no major interstates present in Union County.

Available Sites

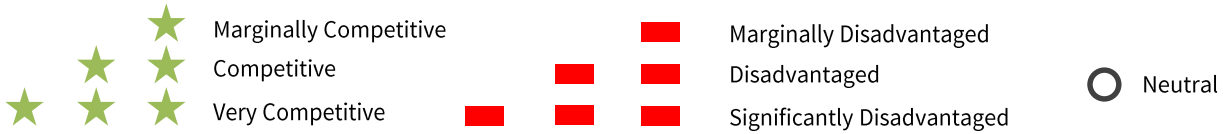
The Innovation Park just off US-33 is owned by the City of Marysville, zoned for heavy industrial use, has access to utilities and no known environmental limitations. Access to the site via highway is not ideal, and opportunities for rail access are limited. Incentives are available for building on the site, but covenants dictating building façades could detract potential businesses. Growth within the park is limited to the existing greenfield space.

Telecommunication /Connectivity

The 33 Smart Corridor in the region will offer 432 strands of redundant fiber along a 35-mile stretch when completed in 2018. The Ohio Turnpike has 241 miles of fiber and plans to install fiber along a 60-mile stretch south of Cleveland in Fall 2017. Other planned fiber installations include stretches on I-270 and I-90 by January 2019. The infrastructure currently being added also provides opportunity for expanded strands of fiber.

Utilities

Natural gas capacity issues are a serious concern. Capacity has become very strained with even greater stresses placed on capacity within the next five years. Infrastructure has not been maintained and major investments need to be made to expand capacity. The issue is being addressed and the region is working toward a solution. Electric and water utilities are both competitive. (NOTE: Utilities were highlighted to show competitiveness of each individual utility.)



Scorecard for Union County – Marysville, OH (continued)

REGULATION AND INCENTIVES

State Regulatory and Permitting

As of the date this research was conducted, the State of Ohio had not enacted legislation or offered an executive order regarding AV use or permitting within the state. With regard to best practices for states, Ohio is considered disadvantaged in providing a competitive environment for CV/AV use and permitting, and not reviewing traffic safety laws that could prove to be a barrier to CV/AV use. While the state does not have any laws that specifically regulate CV/AV, ODOT's interpretation is that it is allowed. Nevertheless, the awareness around this is limited and lends itself to be a disadvantage. The state also launched DriveOhio in January 2018 to research relevant legislation issues and determine policies and procedures, including issuance of executive orders, to clarify the testing of CV-AV. An executive order issued on May 9, 2018 now authorizes AV testing on Ohio's public roadways, subject to safety requirements. This will positively impact awareness and thus improve Ohio's competitive position.

Local Regulatory and Permitting

Both the city and the county are responsible for zoning, building and permitting. The county's capacity is stretched. The dual jurisdiction and limited capacity can create complexity in the permitting process.

State Incentives

JobsOhio administers various grants and loans for business development and expansion, research center creation, revitalization, and job creation. Several state funds offer more specific loans to next-generation technology companies including automotive industry and to local jurisdictions for roadwork development for projects involving job creation, manufacturing, technology R&D, or distribution. There were no CV-AV specific funds available at the state level.

Local Incentives

Union County is a sub-zone of another Foreign Trade Zone. There is also a port authority that is able to buy land, issue tax-exempt bonds, and sell or lease land at privately negotiated prices. There are no incentives specific to CV-AV technology firms. However, there is a Municipal Income Tax Credit with a $2 million fund specified for provisions that include CV-AV industry businesses.

State Business Climate

Ohio's pension fund rating hovered right around the national median in 2016, at 71%, and ranks highest among comparing states Michigan and Nevada. Ohio ranks highest in quality of life (ranked 2 nationally), and higher than the comparing states in regulatory environment. Its lowest rank was labor supply, but did not rank lower than both comparing states in any criteria measured.

Scorecard for Union County – Marysville, OH (continued)

PARTNERSHIPS AND RESEARCH

Presence of Partnerships

The 33 Smart Corridor is a partnership among government, research institutions, industry and economic development stakeholders that collaborate on smart mobility and fiber expansion projects. The states of Ohio, Pennsylvania and Michigan have partnered to create the Smart Belt Coalition whose efforts aim to provide standards for CV-AV technology. Additionally, the launch of DriveOhio provides stakeholders with a single entity to liaise with government organizations on matters of mobility, research, and other CV/AV initiatives. Local partnerships exist between employers, the Ohio State University, various government and non-governmental organizations, and the TRC.

Regional Research (University/Independent Organization)

The Transportation Research Center is an independent facility with academia and government ties that has a 4500-acre testing grounds for any type of vehicle testing including a recent focus on CV-AV. The Center for Automotive Research at Ohio State provides interdisciplinary research on both AV and CV technologies in collaboration with government and industry partners. Honda Research Institute is a Columbus-based research and development facility that has access to the Silicon Valley Honda Research Institute and Honda Innovations, which both conduct CV-AV technology R&D.

Department of Transportation Policies and Programs

There are numerous SMART initiative roadway projects happening around the State of Ohio that the Ohio Department of Transportation manages, but it does not appear that there is a strategic plan, specific program or direct policy that focuses on CV/AV technology deployment at the state level. The launch of DriveOhio, as a separate organization within ODOT, provides access to decision makers and policy makers through a single organized group.

Presence of Strategic Plan

The Union County Economic Development Strategic Plan is broad in nature. It integrates elements from Columbus 2020's strategic plan and has four overall goals; attract, retain, create, and innovate. While some goals are related to the 33 Smart Corridor development, they do not center around this asset. However, current efforts are being made that will create a more narrowly curated strategic plan.

EDO Focus on CV-AV

Due to its location, Ohio is a hub for the transportation and distribution of goods across the US. Transportation infrastructure development is a focus of the Ohio Economic Development Association. Union County Community Improvement Corporation focuses on attracting and growing businesses in the Automotive and Smart Transportation industries. The Council of Governments adds an additional layer of partnership and pooled efforts to focus on CV/AV related industries.

Ann Arbor, MI, Scorecard

Scorecard for Washtenaw County – Ann Arbor, MI

LABOR AND TALENT

Availability of Low-Skilled Labor

There is a low concentration for most low-skilled occupations within the Ann Arbor MSA, but a much higher concentration at the state level. Wages in the region are less than the state and national average. The region would need to increase wages in order to attract low-skilled labor.

Availability of Semi-Skilled/Skilled Labor

There is a lack of semi-skilled labor in the Ann Arbor MSA, especially compared to the state of Michigan, and there isn't a pipeline available to train this type of labor within the region. However, Ann Arbor MSA has an abundance of skilled talent from the University of Michigan in mechanical, electrical, and aerospace engineering that are invaluable to the CV/AV industry. There is a high concentration for this type of labor within the region, and wages are competitive within the state and compared to neighboring state of Ohio to attract and retain this type of talent.

Availability of Professional/Technical Labor

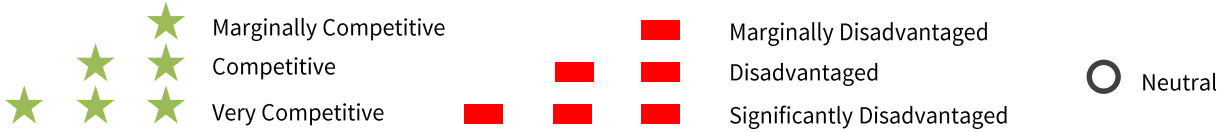
Ann Arbor MSA has the highest wages of any MSA, state and the national average; thereby strengthening its ability to attract and retain this type of talent. However, much of this talent is not relevant to the competitiveness of the CV-AV industry.

Training Programs

The University of Michigan in Ann Arbor provides AV/CV-related academic programs at 4-year and graduate degree levels, including professional short-courses. The University utilizes M-City, a simulated urban transportation environment, as a training ground for students from a variety of disciplines. The undergraduate degree program in Mechanical Engineering affords students exposure to automotive engineering, and there are graduate degree programs in Automotive Engineering and Global Automotive and Manufacturing Engineering. In addition, other schools in the state, including Michigan State University, offer a variety of courses or training related to autonomous vehicles. Washtenaw Community College offers certificates and 2-year degrees in Automotive and Motorcycle Technology.

Education

Washtenaw County has a higher overall educational attainment rate than both Union County, OH, and Clark County, NV, as well as the State of Michigan average. The county boasts a higher percentage of 4-year and graduate degree recipients than any other state or county compared, due to the presence of the University of Michigan in Ann Arbor. The county has the lowest percentage of 2-year degree recipients of any state or county in the comparison.



Scorecard for Washtenaw County – Ann Arbor, MI (continued)

INFRASTRUCTURE

Highway

I-94 cuts across the county and bypasses Ann Arbor to the south, connecting the region to Detroit and Ontario, Canada, in the east and merges several times with I-90, eventually ending at I-90 in Billings, MT, in the west. Four US highways flow through the county: Hwy 23 (connecting to I-75 in the north, ending at the Canadian border in Sault Ste Marie, and I-75 again in the south, ending in Miami, FL), Hwy 12 (which runs parallel to I-80/90, ending in East Chicago to the west and ends at I-96 in Detroit to the east), Hwy 14 (which connects I-94 to I-96 between Ann Arbor and Detroit), and Hwy 52 (which extends north to Hwy 46 west of Saginaw and south to the Ohio border). I-94 and Hwy 52 do not run through Ann Arbor. The region is connected to more than 99 million people within a days drive.

Available Sites

The site of the American Center for Mobility at Willow Run located within Washtenaw County is a 335-acre site available for redevelopment. The site is considered a Renaissance Zone, providing certain tax abatements for the parcels and facilities located on the site.

Telecommunication /Connectivity

The Smart Corridor, a 120-mile stretch along I-96/I-696 in Metro Detroit, has fiber already installed along with a 50-mile initial installation of CV technology. A three-mile stretch of I-75 construction zone is also equipped with vehicle to infrastructure technology. There are also two smart intersections located outside GMs facility in Macomb County. There are plans to deploy fiber and CV technology along a total of 350 miles of I-94, I-75 and US-23.

Utilities

Electric costs are high relative to comparison states and greater than the US average. Gas costs are high relative to comparison states and significantly greater than the US average. Water is abundant in the state and costs are low relative to comparison states.

Scorecard for Washtenaw County – Ann Arbor, MI (continued)

REGULATION AND INCENTIVES

State Regulatory and Permitting

The State of Michigan has enacted legislation defining autonomous vehicles and automated driving systems, and allowing their operation under certain conditions. Legislation also exists that allows for AV research centers to test AV technology, limits liability for repair shops for fixing AVs, and limits liability to vehicle manufacturers for third-party modifications to AVs.

Local Regulatory and Permitting

No specific CV-AV regulations at the city or county levels were found.

State Incentives

Michigan offers a variety of business incentives. Michigan also offers SmartZones as technology incubation, pre-seed and acceleration funds for new tech start-ups including advanced automotive, and private activity bonds offering tax-exempt financing. Huron River Ventures specifically invests in seed-stage smart transportation ventures.

Local Incentives

Several Ann Arbor economic development groups offer tax-exempt revenue bonds or assistance securing funding through state and local sources and angel investors. Some of the angel investors specifically funding automotive and smart technology are located in the region. The site of the American Center for Mobility at Willow Run located within Washtenaw County is considered a Renaissance Zone, providing certain tax abatements for the parcels and facilities located on the site.

State Business Climate

Michigan was ranked 16 across the nation in terms of pension fund rating. The rating increased in 2016 to 64%, and it still remains below the national median. Michigan ranked highest among comparing states Ohio and Nevada in terms of economic climate, but had the lowest rankings in business costs, labor supply, and growth prospects.

Scorecard for Washtenaw County – Ann Arbor, MI (continued)

PARTNERSHIPS AND RESEARCH

Presence of Partnerships

M-City provides a public/private partnership that focuses on researching and testing CV-AV mobility systems. As part of M-City, the Mobility Transformation Center has been created to partner with the many stakeholders involved in deployment of CV-AV technology on Michigan roadways. The Smart Corridor in Metro Detroit represents a partnership between MDOT, Ford Motor Company, General Motors, and U of M where the deployment of CV-AV technology is taking place. There is a CV-AV working group affiliated with the Center for Automotive Research, MDOT and industry. The states of Ohio, Pennsylvania and Michigan have partnered to create the Smart Belt Coalition whose efforts aim to provide standards for CV-AV technology.

Regional Research (University/Independent Organization)

The University of Michigan-housed Transportation Research Institute (UMTRI) and M-City provide research and testing of CV-AV technology on a 32-acre site in collaboration with government and industry partners. The American Center for Mobility, a Ford Motor Company constructed site that was originally called Willow Run and used to build advanced aircraft, has been converted to a 335-acre CV-AV testing and verification site. In addition, the Center for Automotive Research (CAR) is an independent, non-profit research organization that aims to engage industry-affiliated organizations to improve technology (including CV-AV) and US auto industry competitiveness in the global marketplace.

Department of Transportation Policies and Programs

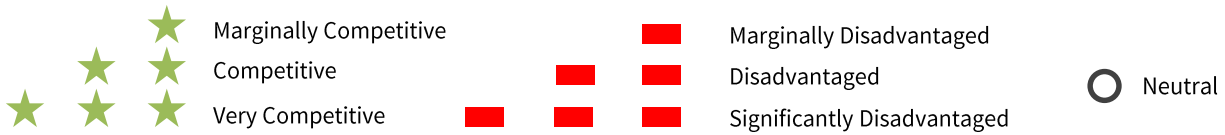
The state Department of Transportation in Michigan has a specific CV-AV Technology Strategic Plan that is intended to guide decision making on projects related to CV-AV. The plan does not lay out any specific actions that will be taken to further CV-AV initiatives, but instead indicates it should be referenced to guide project tactics. MDOT has a Connected Vehicles Test Bed program that allows for testing of CV technology in real-world applications and provides associated data to stakeholders for technology improvements and creation of additional test beds. The program is connected to test bed programs in other states and countries in order to share information and lessons-learned.

Presence of Strategic Plan

In addition to the state Department of Transportation in Michigan having a CV-AV strategic plan, the Center for Automotive Research developed a strategic growth plan for the industry focused on Southeast Michigan.

EDO Focus on CV-AV

Michigan EDC's Planet M program provides assistance connecting any mobility-focused companies or investors to the extensive local automotive network. Accelerator Next Energy organizes Smart Cities competitions and afford the winners financial incentives to launch new technologies.



Las Vegas, NV, Scorecard

Scorecard for Clark County – Las Vegas, NV

LABOR AND TALENT

Availability of Low-Skilled Labor

General labor is less concentrated in the Las Vegas MSA than in the state of Nevada, and wages indicate the region is not competitive in attracting this type of labor. If there is a demand for production labor, the region would struggle to attract it.

Availability of Semi-Skilled/Skilled Labor

There is a lack of semi-skilled labor in the region. Regional completions of technical degrees and the local technical degree pipeline for automotive technology degrees is also in place at the College of Southern Nevada in Las Vegas. There is a low concentration of engineers and IT professionals in the Las Vegas MSA compared to the state of Nevada, while regional completions of these types of degrees in the Las Vegas MSA are competitive to high. Wages within the region for skilled labor would need to increase to be more competitive with the rest of the state.

Availability of Professional/Technical Labor

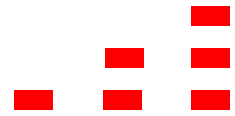
Las Vegas MSA and Nevada are in the middle of comparison MSAs and states, respectively, in terms of wages of professional and technical labor. However, much of this type of labor is not relevant to the competitiveness of the CV-AV industry.

Training Programs

The University of Nevada-Las Vegas offers undergraduate and graduate degrees programs in Mechanical Engineering, with the option of graduate students specializing in automotive engineering applications. While it's not clear if UNLV offers CV/AV-related courses, there are courses in Unmanned Aircraft Systems and Transportation that lend themselves to CV-AV applications. The local pipeline for talent to drive automation is present within the robotics program at the University of Nevada – Las Vegas. The University of Nevada in Reno also offers graduate students opportunities for smart mobility-related research in Mechanical and Civil Engineering in collaboration with state agencies and local research centers. The College of Southern Nevada in the Las Vegas area offers an Automotive Technology program with certificates up to a 2-year degree.

Education

Clark County has the lowest percentage of educational attainment represented among all the comparison regions. The county has the lowest educational attainment of all degree types represented among all comparison regions except 2-year degree recipients, in which it slightly edges out Washtenaw County, MI.



Scorecard for Clark County – Las Vegas, NV (continued)

INFRASTRUCTURE

Highway

I-15 extends through Clark County, connecting Las Vegas to San Diego, CA, in the southwest and to the Canadian border adjacent Montana. I-515, 215 and 11 help the flow of traffic loop around the Las Vegas area and extend only as far southeast as Henderson. Two main US highways flow through the county: Hwy 95 (connecting Las Vegas to I-80 to the northwest and the Mexican border in the south), Hwy 93 (connecting Las Vegas to I-80 in the north at the Utah border and merges with US Hwy 60 north of Phoenix, AZ). These roadways connect Clark County to almost 54 million people within a days drive.

Available Sites

The City of Las Vegas has a dedicated Innovation District in the downtown tourist area that allows the city the flexibility to set policies and procedures to test emerging CV/AV technology within its limits. The city is considering building a testing facility in a lower density portion of this district, and has several properties available for development or repurpose. In addition, the Cheyenne Technology Corridor of North Las Vegas is being designed as a diversified technology district with 2 million square feet of mixed use space on 2,964 acres of land.

Telecommunication /Connectivity

Las Vegas has a total of 14 smart intersections in the pilot phase with 24 more slated for installation, each employing dedicated short range communication radios. Connected corridors are slated for 6 streets in the downtown Innovation District in the northwest corner of The Strip. The city has over 125 miles of fiber optic cable installed in roadways and more than 900 traffic signals. The city is beefing up its WiFi connectivity and has one of the most open policies for sharing data in the country. There is a regional economic development group beginning to push for a new interstate between Las Vegas and Phoenix, which is slated to include fiber optic installation.

Utilities

Electric and gas costs are low relative to comparison states of Ohio and Michigan. Electric costs are competitive at the national level, but gas costs are significantly higher than the national average. Drought conditions in the region limit water usage, thereby increasing costs for water-intensive commercial consumption.

Scorecard for Clark County – Las Vegas, NV (continued)

REGULATION AND INCENTIVES

State Regulatory and Permitting

The State of Nevada was the first state to enact legislation regarding autonomous vehicles. The legislation defines autonomous vehicles, allows their use under certain conditions, and provides a specific drivers license for AVs. Policies have also been enacted allowing cell phone use by 'drivers' of AVs, requiring AV drivers to meet certain conditions (such as proof of insurance) and limits liability to auto manufacturers for third party modifications to AVs, and defines conditions around "driver-assisted platooning".

Local Regulatory and Permitting

Clark County regulation allows for automated (robotic) parking garages, but does not offer incentives for providing these facilities. The County has considered offering parking credits for those businesses that provide them. The City of Las Vegas has a dedicated Innovation District in the downtown tourist area that allows the city the flexibility to set policies and procedures to test emerging CV/AV technology within its limits.

State Incentives

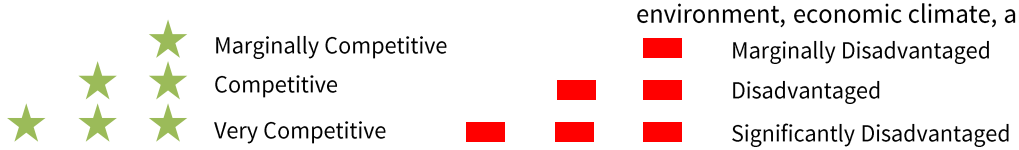
The State of Nevada offers Catalyst Funds that provide $1M to $5M for building expansions or relocations that will quickly provide jobs in Nevada (a program that also exists on the federal level), as well as sales/use tax abatements on capital equipment purchases. The state also offers $25k to $1M for employee training grants and opportunity zone economic development. Technology-based financing can be secured through the Technology Business Alliance of Nevada. The state offers an aviation parts tax abatement, but nothing specific to CV-AV.

Local Incentives

The City of Las Vegas offers TIF, Downtown Business Assistance Program for rehabilitation of commercial and industrial properties located within redevelopment areas, as well as fee waivers on a case-by-case basis. The county offers no corporate income tax and a foreign trade zone to aid the distribution and transportation sector, as well as financing from angel investor groups. No local incentives specific to CV-AV were identified.

State Business Climate

Nevada's pension fund rating was slightly higher than the national median in 2016, at 72.3%, indicating a relatively strong ability to meet its financial obligations. Among comparing states Ohio and Michigan, Nevada ranked highest in growth prospects, but had the lowest rank in regulatory environment, economic climate, and quality of life.



Scorecard for Clark County – Las Vegas, NV (continued)

PARTNERSHIPS AND RESEARCH

Presence of Partnerships

Nevada Center for Advanced Mobility (NCAM) is a joint venture among university, government and industry partners that drives CV-AV, connected corridor, smart city and associated data projects in the state. The efforts seem to be well-coordinated.

Regional Research (University/Independent Organization)

The University of Nevada-affiliated Nevada Center for Applied Research has two initiatives dealing with autonomous vehicles: 1) Nevada Advanced Autonomous Systems Innovation Center (NAASIC), which works to develop driverless car technology; and 2) Intelligent Mobility "Living Labs", which aims to deliver technology that allows cars to sense and communicate with the transportation system.

Department of Transportation Policies and Programs

The state Department of Transportation announced in 2016 that it was collaborating with the Nevada Department of Motor Vehicles and CH2M, a construction engineering consulting firm, to establish a policy framework around CV/AV infrastructure and resource use at the state level. It was not clear from the press release when this framework was slated to be completed.

Presence of Strategic Plan

The regional economic development organization Las Vegas Global Economic Alliance (LVGEA) has a strategic plan, but it incorporates more unmanned aerial systems and does little to incorporate AV-CV. The state DOT transportation strategic plan identifies an effort to decrease traffic fatalities to a level below the national average, and many groups developing AV-CV technology in the state use this as a primary motivator for their efforts.

EDO Focus on CV-AV

The State of Nevada's Office of Economic Development, as well as Clark County Economic Development has a focus on unmanned aerial vehicles, which has some overlap with CV-AV technology. There is a comprehensive economic development strategic plan for the LVGEA, the Las Vegas regional economic development partners, that lists identification of corridors for future autonomous transportation modes for moving cargo as an action item. Again, there is a regional focus on unmanned aerial systems, which has some overlap with CV-AV technology, but little specific to automobiles or infrastructure.

TRENDS

Some trends emerging from our exploration of the three comparison regions are highlighted below.

NEVADA

- Much of the research, development, and deployment of CV/AV-related technology stems around the concept of keeping people safe and traffic flowing in the urban environment. There are intersections, parking garages, and a corridor covering a portion of the Strip that have SMART technology infrastructure.
- Nevada stakes their claim in the CV/AV realm of being the first state to have a policy regarding CV/AV testing and deployment on roadways. In Nevada, innovation has outpaced policy to such an extent that policy was evolved and changed to meet the pace.
- While Las Vegas claims much of the CV/AV deployments, Nevada has more educational and training resources, as well as road projects taking place around Reno.
- Much of the information regarding university research and development, as well as state level aspects of CV/AV technology implementations in Nevada is not well marketed on websites or in news releases.
- The region has strong education and research programs around unmanned aerial systems (i.e., drones) for use in defense, as well as within the CV-AV system.

MICHIGAN

- Michigan is a true competitor with Ohio in terms of the CV/AV resources planned and implemented. Most of the deployments of CV-AV technology are in the Ann Arbor and Detroit areas.
- The abundance of educational, research, and testing facilities and programs are located in Ann Arbor. There are three major public/private research facilities within the region that contribute to the urban and rural/highway research base. Ann Arbor is centrally located an hour or less in proximity between numerous auto manufacturers in Detroit and another major university with an engineering program focusing on CV/AV research in East Lansing (Michigan State University) that can contribute to the research and development of the CV/AV industry knowledge within the region.
- The CV-AV entrepreneurial ecosystem is well-developed in Ann Arbor. In addition to education, research and testing facilities; there is a focus at the state economic development organization level on mobility-related technology; entrepreneurial resources available such as an incubator, accelerator, a smart cities contest and access to angel and venture capital funding to support entrepreneurs at various stages of technology development.

TRENDS (CONT'D)

MICHIGAN (cont'd)

- Michigan policies are supportive of testing and deploying CV-AV technologies. In addition, there is a test bed program to share data from CV-AV technologies being tested, including sharing information and lessons learned with other states and countries.
- Michigan has a higher concentration of skilled labor (i.e., engineers) relevant to the CV-AV industry than comparison states of Nevada and Ohio.

OHIO

- Ohio has a strong CV-AV ecosystem with a variety of SMART transportation projects in terms of urban (SMART Columbus), rural/highway (33 SMART Corridor), and testing of resources (TRC) in a concentrated area supporting a highly utilized transportation infrastructure. In addition, there are many partnerships that support this ecosystem through education, research and development, and testing.
- One competitive advantage Columbus MSA and Ohio have over Michigan is the ability to attract or retain talent necessary for the local CV-AV industry. Comparatively, Columbus MSA and Ohio have higher regional completions of low- and semi-skilled labor than Nevada, Michigan or their respective MSAs. In addition, Union County has a higher concentration of both low- and semi-skilled labor than comparison MSAs. For skilled labor, Ohio has higher regional completions on the state level, but Ann Arbor has higher regional completions than Columbus MSA. In terms of attracting and retaining this talent, Union County has a higher concentration than comparison MSAs for skilled labor. On a state level, Michigan has a higher concentration of skilled labor compared to Ohio or Nevada.
- Coordination and support of CV-AV industry activities could be improved through an awareness or marketing campaign of the state level efforts to support the industry as well as the interpretation of legislation and permitting.

KEY STATEWIDE INCENTIVES (from JobsOhio)

- **JobsOhio Economic Development Grant:** This reimbursement grant program provides targeted industries and business functions funding for projects that create jobs within a specified period of time, as well as those that improve operational efficiencies or expansion of production while retaining jobs.
- **JobsOhio Growth Fund:** This fund provides capital for expansion projects to companies that have limited access to funding from conventional, private sources of financing. JobsOhio will consider loans to companies that are in the growth, established or expansion stage and that have generated revenue through a proven business plan.
- **Research and Development Center Grant:** The grant facilitates the creation of corporate R&D centers in Ohio to support the development and commercialization of emerging technologies and products.
- **JobsOhio Revitalization Program:** This program focuses on helping rejuvenate sites in preparation for end-users that support job creation opportunities for Ohioans. The program, which includes both loans and grants, is available to public and private entities seeking to clean up and redevelop sites across Ohio.
- **JobsOhio Workforce Grant:** By providing funding to companies for employee development and training programs, this grant promotes economic development, business expansion and job creation.
- **Research and Development Investment Loan Fund:** Provides loan financing ranging from $500,000 to $5 million for projects primarily engaging in R&D activity. The loans have fixed rates (at or below market rates) and other loan terms similar to those of commercial bank financing. Companies receive a dollar-for-dollar, nonrefundable Ohio commercial activity tax credit for principal and interest payments made during the year up to $150,000 during the loan term.
- **166 Direct Loan:** Gives eligible businesses loans for land and building acquisition, construction, expansion or renovation, and equipment purchases. The program provides low-interest loans up to 40 percent of the cost not to exceed $1.5 million.
- **Innovation Ohio Loan Fund:** This fund provides loans for acquisition, construction and related capital costs of technology, facilities and equipment purchases. The fund was created to help Ohio companies develop next-generation products and services within the state's key industry sectors. Loans range from $500,000 to $1.5 million and can cover up to 75 percent of the project cost.
- **Roadwork Development (629) Funds:** These funds are available for public roadway improvements, including engineering and design costs. Funds are accessible for projects that create or retain jobs and primarily involve manufacturing, technology, research and development, corporate headquarters and distribution activity. Grants are provided to a local jurisdiction and require local participation. They can be used to reimburse accumulated costs.

KEY STATEWIDE INCENTIVES (from JobsOhio, cont'd)

- **Job Creation Tax Credit:** This is a refundable and performance-based tax credit calculated as a percent of created payroll and applied toward the company's commercial activity tax liability. Should the amount of the credit exceed the company's commercial activity tax liability for any given year, the difference is refunded. Companies creating at least 10 jobs (within three years) with a minimum annual payroll of $660,000 and that pay at least 150 percent of the federal minimum wage are eligible for the credit; however, they must apply for the credit before committing to a project. The Ohio Tax Credit Authority must approve applicants before hiring begins.
- **Data Center Tax Abatement:** The Data Center Tax Abatement provides a sales-tax exemption rate and term that allow for partial or full sales tax exemption on the purchase of eligible data center equipment. Projects must meet minimum investment and payroll thresholds to be eligible. Final approval of the tax exemption is contingent upon the approval of the Ohio Tax Credit Authority.

KEY COUNTY/LOCAL INCENTIVES (from Union County Community Improvement Corporation)

- **Union County Enterprise Zone Program:** The Union County Enterprise Zone Program offers tax abatements on real (building construction) and/or personal property (machinery and equipment, furniture and fixtures, inventory) for manufacturing companies wanting to expand or locate within the designated Enterprise Zone areas that are located in the City of Marysville, the Village of Richwood and portions of southern Union County. The term and amount of the tax abatement is based upon the number of employees, amount of payroll, and amount of private property investment.
- **Marysville Community Reinvestment Area:** In an effort to improve its uptown and surrounding neighborhoods, the City of Marysville established a Community Reinvestment Area that provides real property tax abatements for residential, commercial, office and industrial development. The term and amount of the abatements vary depending on the land use, number of jobs created or retained, amount of payroll, and the amount of the investment.
- **Plain City US 42 Business Park Community Reinvestment Area:** Union County administers the US 42 Business Park CR, which has specific eligibility requirements as outlined in the Union County Economic Development Incentive Policy. In general, the CRA allows real property tax abatements on qualifying residential, commercial, office and industrial construction projects occurring within the portions of Plain City that are located within Union County. The term and amount of the abatements vary depending on the land use, amount of jobs created or retained, amount of payroll, and the amount of the investment.
- **Union County Community Improvement Corporation (CIC):** The Union County Community Improvement Corporation (CIC) is the statutory nonprofit Economic Development arm of the community. The CIC has unique economic development capabilities that include the ability to borrow money, purchase and lease land and buildings, purchase and lease personal property, and issue bonds or notes.
- **Marysville – Union County Port Authority:** The Marysville-Union County Port Authority is a statutory agent of Union County that does not operate a traditional port. Under the Ohio Revised Code, port authorities are given certain powers in the areas of real estate development, financing and management of foreign trade zones. Unlike a city or county, port authorities can buy land and construct a building that could be leased or sold to a business of its choosing at a privately negotiated price. They can also issue tax-exempt (and therefore, lower interest bonds) on behalf of a private entity for the construction of new plant or equipment.
- **Foreign Trade Zone (FTZ):** Union County is a subzone of the Rickenbacker FTZ #138, and is legally considered outside of US Customs territory for the purpose of duties.
- **Municipal Income Tax Credit:** Union County provides an income tax credit from a $2 million reserve fund specified for new businesses, expansions or relocations to the county.

FUNDING SOURCES

The following sources of funding for CV/AV projects is a compilation of those sources mentioned by stakeholders interviewed during Ady Advantage team visit to Union County in December, 2017.

Federal Funding:
- Department of Defense
- National Science Foundation
- Department of Commerce
- National institutes of Health
- Department of Energy
- Department of Transportation
- National Aeronautics and Space Administration

State Funding:
- JobsOhio
- Ohio Third Frontier

Private Funding:
- Honda
- Boeing
- GE Aviation

SECTION 4: STAKEHOLDER AND EMPLOYER INPUT AND ANALYSIS

Section 4: Stakeholder and Employer Input and Analysis

Site Visit Analysis

Site Visit Analysis

OVERVIEW

Ady Advantage was given a windshield tour of one of the sites available in Union County during our on-site visit on December 12. Sites and buildings were evaluated based upon a criteria of the potential following key deficiencies:

1. Control: Lacking ownership of the site or an option on it.
2. Utilities: Lacking utilities to the site OR a description of how much it would cost, how long it would take, and who would pay for the utilities infrastructure.
3. Technical information: Lacking information about flood plains, environmental testing, etc.
4. Zoning: Not zoned for intended use.
5. Pad: Site needs leveling.
6. Other: Specified in table.

Sites and locations were then assigned a grade, A through F, based on how they measured on these key deficiencies. Additional comments are provided for each site and location explaining the details and evaluation of that particular site/location. The sites and buildings on the following pages are in order of overall grade. Only those sites that have been evaluated in-person have been included. This ensures the integrity of the analysis and follows the site selection process.

Although not part of the site visit, Union County does have a certified site. The site boasts just under 74 acres with significant water and electric capacity.

Site Visit Analysis

Site Name/Location	Grade and Key Deficiencies	Comments
Innovation Park	Grade: B+ Deficiencies: 6	The site is located on Innovation Way, accessed via Industrial Parkway, and adjacent US-33 between the US-36 (Delaware Ave) and Scottslawn Road interchanges. The site is owned by the City of Marysville, zoned for heavy industrial use, and flat with no known contamination or other environmental limitations. Utilities have been brought to the curb. Opportunities for movement of freight by rail or air from the site are limited. Incentives are available for building on the site. In addition, the capacity of the site is 200 acres.

Key Deficiencies Codes

1. Control: Lacking ownership of the site or an option on it.
2. Utilities: Lacking utilities to the site OR a description of how much it would cost, how long it would take, and who would pay for the utilities infrastructure.
3. Technical information: Lacking information about flood plains, environmental testing, etc.
4. Zoning: Not zoned for intended use.
5. Pad: Site needs leveling.
6. Other: Specified in comments section above.

Employer Interviews

Employer Interviews

Ady Advantage conducted confidential interviews of the following two individuals from two companies in Union County that represent and impact the region's economy. Given the small size and discrete nature of the industries, responses have been aggregated into themes related to the questions. These interviews were conducted during the on-site visit to Marysville from December 12-13.

Company	Name	Title	Industry	Total Employees
Honda North America	Mike Wiseman	Ohio State Partnership Co-Director/ Associate Chief Advisor	Automotive	>5000
Transportation Research Center	Joanna Pinkerton	COO	Research/Education	>400
Scott's Miracle Gro Manufacturing Plant	Ellen Ahijevych	Plant Manager	Agribusiness	>300

WHAT IS YOUR BIGGEST CHALLENGE IN YOUR BUSINESS RIGHT NOW OR WHAT DO YOU THINK IS THE NUMBER ONE THING THAT IS HOLDING YOU BACK?

Respondents indicated a difficulty in finding talent and lack of proper marketing and messaging as the biggest challenges facing their businesses right now.

IS YOUR COMPANY'S PRIMARY MARKET LOCAL, REGIONAL, NATIONAL OR INTERNATIONAL?

Employers indicated that their companies operate internationally, with each having a different percentage of their business comprised of international clientele.

WHAT PERCENTAGE OF YOUR COMPANY'S LABOR FORCE IS REPRESENTED BY ONE OR MORE UNIONS?

None of the employers indicated a union presence in their companies.

WHAT IS THE AVERAGE EMPLOYEE COMMUTING DISTANCE (ONE-WAY)?

Employers indicated 15 to 20 miles to be the average distance employees commute to work at their facilities. Some noted farther commutes of 35 to 40 miles.

WHAT IS THE AVERAGE EDUCATIONAL LEVEL OF YOUR EMPLOYEES?

Respondents noted the average educational level to be a high school diploma. Each employer has specialized positions that require a specific technical or college degree.

HOW WOULD YOU RATE THE AVAILABILITY OF HOURLY WORKERS IN THIS AREA, ON A SCALE FROM 1 TO 5, WITH 5 BEING THE LOWEST?

Respondents rated worker availability in the area an average of 2.5.

DESCRIBE YOUR RECRUITMENT PROCESS. HOW EASY IS IT TO RECRUIT EMPLOYEES FROM OUTSIDE THE REGION? HOW DO YOU RECRUIT FROM OUTSIDE OF THE REGION?

Employers described using different strategies for different types of positions. Resources like full-time dedicated recruitment managers and utilization of temp-to-hire agencies are used, as well as online resources like LinkedIn and other social media and company websites. There is some focus on recruiting from universities, including providing internships, hosting events and attending career fairs to reach potential candidates.

FROM YOUR PERSPECTIVE, WOULD YOU SAY YOUR COMPANY IS A PREFERRED EMPLOYER, COMPETITIVE, OR BELOW MARKET RATE? WHY?

Respondents rated their companies differently, primarily when focusing on the types of positions they are employing. For some positions, like entry-level and full-time, employers are considered competitive or preferred. For higher level positions, employers ranged from below market rate to preferred.

Employer Interviews

HOW WOULD YOU RATE THE PRODUCTIVITY OF YOUR EMPLOYEES, ON A SCALE FROM 1 TO 5, WITH 5 BEING THE BEST?

Respondents rated worker productivity an average of 4.5.

HOW WOULD YOU RATE THE WORK ETHIC OF YOUR EMPLOYEES, ON A SCALE FROM 1 TO 5, WITH 5 BEING THE BEST?

Employers rated employee work ethic an average of 4.5.

HOW WOULD YOU RATE THE STABILITY OF YOUR EMPLOYEES, ON A SCALE FROM 1 TO 5, WITH 5 BEING THE BEST? DO YOU HAVE ANY ISSUES WITH TURNOVER, ABSENTEEISIM RATES?

Respondents rated the stability of their employees an average of 4.25, and low turnover rates (all noted rates less than 10%). Employers indicated most of the turnover is due to retirements.

DO YOU CURRENTLY WORK WITH ANY LOCAL EDUCATIONAL INSTITUTIONS ON TRAINING PROGRAMS OR DO YOU PRIMARILY TRAIN IN-HOUSE?

Employers indicated working with local universities on workforce development, including the Ohio State University, the University of Cincinnati, and Ohio High Point. Employers also indicated providing some training in-house.

WHAT TRAINING NEEDS WILL YOU HAVE IN THE FUTURE?

Respondents noted a need for three main types of training: soft skills (like social etiquette), technical and professional. Strategic thinking, organizational design, and skilled trades technicians were all mentioned as training needed in the future.

TO WHAT EXTENT DOES YOUR FACILITY USE AUTOMATION. WHAT ARE YOUR FUTURE PLANS ON AUTOMATION?

Respondents noted using automation to varying degrees at each of their facilities. Most of the automation is geared toward a specific task within each company, and its use is expected to increase in the future.

WHAT ARE YOUR COSTS OF DOING BUSINESS? ARE THEY COMPETITIVE, HIGH OR LOW?

Costs varied, with distribution, occupancy and taxes noted as being competitive or low. Labor and utility costs were mixed.

HAVE YOU HAD ANY REGULATORY OR PERMITTING ISSUES AT THE STATE OR LOCAL LEVELS?

Respondents described different regulatory issues at the state level, primarily environmental, and none at the local level.

ARE YOU AWARE OR HAS YOUR COMPANY TAKEN ADVANTAGE OF ANY INCENTIVES AT THE STATE OR LOCAL LEVELS?

Employers did not indicate awareness of any incentives their company has taken advantage of.

WHAT FEDERAL, STATE, OR LOCAL PROGRAMS ARE AVAILABLE TO YOU FOR RESEARCH, PARTNERSHIP BUILDING OR FINANCING PROGRAMS?

Employers noted a variety of federal and state programs, including those from the US Department of Energy, National Science Foundation, and Department of Transportation, as well as research and development program funds from the state of Ohio.

WHAT INDUSTRY, TYPES OF BUSINESSES OR SPECIFIC COMPANIES DO YOU THINK WOULD BE A GOOD FIT FOR THE REGION? WHY?

Employers suggested adding more, diverse manufacturing to evolve the growth of the economy, more research and development and more hospitality businesses in the region.

IF THE REGION COULD DO ONE THING DIFFERENTLY TO HELP EXISTING BUSINESSES, WHAT WOULD IT BE?

There are a lot of good things going on in the region currently that respondents noted, especially helpful transportation resources. However, respondents also described two main actions that would help existing businesses in the region, namely talent and skill development and more consistent marketing.

Education Leadership Interview

Education Leadership Interview

Ady Advantage conducted an interview with leadership of an education institution in Marysville on December 12. The following pages reflect their responses to education-related questions regarding the Union County area.

Institution	Name	Title	Total Student Population
Ohio State University	David Williams	Dean, College of Engineering	8500 undergraduate 2000 graduate students

"Stakeholders discuss the 33 Smart Mobility Corridor's key opportunities during Ady Advantage's on-site visit in December 2017"

WHAT ARE THE MOST POPULAR PROGRAMS?

Mechanical and Aerospace Engineering are the most popular. Computer Science and Electrical Engineering are also very popular. The largest growth in the College of Engineering has been in bioengineering. In general, we've seen growth in all engineering programs.

HOW OFTEN ARE NEW DEGREE PROGRAMS OR CERTIFICATIONS INTRODUCED? WHAT DRIVES THIS?

There is a new program in Engineering Education, and our Data Analytics program is 3 years old. This process is led by faculty, ideas are socialized, and there are complex approval processes.

WHAT ARE THE MAJOR CHALLENGES FACING YOUR ORGANIZATION OVER THE NEXT FIVE YEARS? HOW ARE YOU PREPARING TO MEET THESE?

Our biggest challenges involve facility and capacity. Our programs are growing and we will need the space to meet these demands.

WHAT STRATEGIC PARTNERSHIPS DO YOU HAVE WITH PRIVATE AND PUBLIC/NON-PROFIT ENTITIES?

We have partnerships with private or public/non-profit entities within each of the following research centers and programs:

- *Transportation Research Center (TRC), where we partner with industry and other academic institutions;*
- *Center for Automotive Research (CAR), which is a partnership with our Mechanical Engineering Department, Honda, and some other OEMS;*
- *Simulation Innovation and Modeling Center (SIM Center), which deals with computer modeling and manufacturing processes of autonomous vehicles;*
- *Geospatial analytics group (GDA), in our Civil, Environmental and Geodetic Engineering Department;*
- *Satellite Navigation and Inertial Navigation Laboratory (SPIN Lab); and*
- *Translational Data Analytics Institute (TDAI).*

Education Leadership Interview

WHAT PARTNERSHIPS ARE YOU WORKING ON?

We have partnerships with over 2000 companies, our newest includes Apple. We have over 2000 alumni in the Bay area, and we work with companies that hire our students.

FROM YOUR PERSPECTIVE, WHAT DO YOU SEE AS THE MAJOR WORKFORCE TRENDS IN THE AREA? ARE THERE ANY MAJOR SHIFTS HAPPENING?

We have seen the appearance of Facebook in New Albany, and Amazon is putting in server firms. There has been a rise in IT focus in the area, as well as increasing opportunities for startups. Data analytics, financial engineering and cybersecurity are all increasing in demand in the area.

WHAT DO YOU THINK IS THE AREA'S GREATEST TALENT/WORKFORCE ISSUE?

Competition for engineers is strong, especially with the San Francisco Bay area and their attractive messaging. About half of our engineers do stay in Ohio, and about half of those engineers end up staying in central Ohio.

WHAT TYPES OF POSITIONS DO YOU SEE ARE LIKELY TO BE MOST IN NEED FOR THE AV-CV INDUSTRY OR AUTOMOTIVE?

The AV-CV industry will need data analytics positions, as well as cybersecurity and automation.

WHAT IS YOUR SCHOOL DOING TO PREPARE FOR THESE?

We currently have the largest data analytics program in the country, with 400 students. We are developing a new cybersecurity program to meet these demands.

WHAT FUNDING PROGRAMS ARE AVAILABLE TO PROVIDE ADDITIONAL RESOURCES FOR RESEARCH, CAPACITY BUILDING, ETC.?

Federal program funding is available through the Department of Defense, NASA, Department of Commerce, the National Institutes of Health, and increasingly the National Science Foundation. On a state level, funding can be found through JobsOhio, and Ohio Third Frontier. Some private funding sources might be Honda, Boeing and GE Aviation.

WHAT ARE THE AREA'S BEST ASSETS TO BE COMPETITIVE IN THE CV-AV INDUSTRY?

Locally, we are developing autonomous vehicles on campus, and we have other assets like data analytics program, geospatial location capabilities, Route 33, testing capabilities and cybersecurity. Another great asset is the partnership among the Departments of Transportation in Ohio, Michigan and Pennsylvania that also includes partnering universities in those states (Ohio State, Michigan State and Carnegie Mellon Universities) for connected auto trucks and corridors in Pittsburgh, Columbus and Ann Arbor.

WHAT AUTOMOTIVE OR CV-AV INDUSTRIES DO YOU THINK WOULD BE A GOOD FIT FOR THE AREA?

Waymo, formerly Google's self-driving car project, or AV buses (known as Olli's) would be a good fit for the area.

Stakeholder Interviews

Stakeholder Interviews

Ady Advantage conducted confidential interviews of the following seven individuals from six stakeholder organizations that sit on the 33 Smart Mobility Corridor's Steering Committee. All participants were very forth coming and willing to participate in these interviews. Given the small size and discrete nature of the industries, responses have been aggregated into themes related to the questions. These interviews were conducted during our on-site visit to Marysville from December 12-13.

Company	Name	Title	Industry
Hicks Partners/Union County Community Improvement Corporation	Keith Conroy	Chairman/Lobbyist	Community Development
Columbus 2020	Matt McCollister	Vice President of Business Development	Economic Development
The Ohio Department of Transportation	Andrew Bremer	Strategic Initiatives (Smart Mobility)	Government
JobsOhio	Kristin Tanner	Director of Automotive	Government
Lee and Associates	Todd Spencer	Broker	Real Estate
AutoTool, Inc.	Bassam Homsi	President	Manufacturing
Evolve	Brian Pitzer	President/CEO	Consulting

WHAT ARE UNION COUNTY'S GREATEST ECONOMIC ASSETS?

There were several key economic assets mentioned. First, Honda and partnering organizations, like Transportation Research Center and Smart Columbus, were mentioned for their transportation and innovation-based resources. Second, stakeholders described how important location was to the local economy, specifically proximity to Columbus and it's population base, markets and universities. Finally, resources for startups and foundational resources, like the Innovation Park, were mentioned to be most important to the local economy.

Additional assets mentioned include the variety of industry firms, low cost of living, stability and the culture around football.

WHICH INDUSTRIES OR CLUSTERS DO YOU THINK THE UNION COUNTY ARE IS, OR COULD BE COMPETITIVE IN? WHY? IN CV-AV?

Stakeholders most often mentioned automotive-related industries as a source of competitive advantage for the region, with Tier 1 suppliers and the associated supply chain primarily cited. Research and development, including academia, was also described as an industry the region is very competitive in. Stakeholders brought up the importance of partnerships to both of these primary industry clusters for their growth and development. Additionally, automotive periphery bridging to other industries (including logistics, software, cybersecurity and adaptive technology) were noted as a competitive cluster in the region. Finally, other industries discussed that the region is or could be competitive in were career centers with an industry focus and startups.

WHAT ARE UNION COUNTY'S GREATEST CHALLENGES AND OPPORTUNITIES?

The stakeholders were asked to describe the region's greatest challenges and opportunities through strengths, weaknesses, opportunities and threats.

STRENGTHS: *Automotive resources, including a connected corridor with lots of vehicles, 1200 CVs on the road, and Honda were noted as primary strengths. Additionally, a pro-business, progressive, unassuming mindset was often described as a factor that sets the area apart. The area also has room for expansion, is in a prime location, has a supportive structure of government, and has people like Eric Phillips and businesses like Miracle Gro.*

WEAKNESSES: *Public sector challenges, described as a lack of or slow visioning, siloed thinking and indecision; were the primary weaknesses described by respondents. The lack of shovel ready land, available land and buildings were also notable weaknesses. Honda and talent attraction were also mentioned as challenges for the region to overcome.*

OPPORTUNITIES: *Stakeholders described a diversity of opportunities, with no one opportunity seeming more important than another. Development was noted, including development of infrastructure, the AV industry, and land. Failure, a narrow vision, and operational costs were all opportunities for improvements. Lack of CAV focus at Honda, disruption opportunities, talent, more product, and better messaging round out the areas stakeholders believe opportunities lie for Union County.*

THREATS: *Competitiveness of other regions, like Silicon Valley and Detroit, for Honda and site selection of other automotive industry businesses were noted as primary threats for Union County. Public sector challenges regarding response to change was another notable threat, including lack of vision or slow visioning, indecision, staying in comfort zone, and siloed thinking. Talent, reduction in volume, electrification, disruption, and shared ownership were seen as other important threats challenging Union County in the future.*

WHAT STRATEGIC PARTNERSHIPS DO YOU HAVE WITH PRIVATE AND PUBLIC/NON-PROFIT ENTITIES?

Most notable strategic partnerships exist with Japanese companies and state agencies. Respondents noted some new partnerships, including Drive Toward a Safer Ohio, an initiative driven by the Department of Public Safety in cooperation with the Bureau of Motor Vehicles, Department of Insurance, Environmental Protection Agency, and the Governor's Office. JobsOhio, Columbus 2020, and Council of Governments are some additional partnerships stakeholders have developed partnerships with. Ohio Department of Transportation has partnered on initiatives by dedicating staff time and fiber for projects.

WHAT PARTNERSHIPS ARE YOU WORKING ON?

None of the stakeholders noted working on new strategic partnerships.

WHAT'S MISSING (RESEARCH NEEDS, VALUE CHAIN, FUNDING, PARTNERSHIPS, ETC.)?

Stakeholders described some critical missing pieces of the CV-AV puzzle that are missing, which could provide a stronger, more stable future for the industry in the area. One major missing piece of the puzzle is talent development, specifically to suit the CV-AV industry's diverse needs, but also for other regional business growth. Industry wants students from Ohio State University to have co-op and internship opportunities to prepare them for jobs within the region and CV-AV industry. There is a need for businesses to align and collaborate in a way that helps them identify and coordinate talent development initiatives in the region.

Respondents also noted a need for a critical mass of research. The Transportation Research Center has almost every OEM doing testing at their facility in the region. However, they lack a long-term OEM tenant that is also doing research and development, not just testing.

Finally, respondents noted that a strategic vision for the industry is missing. The region's industry is ready and able, but developing that vision would prove that they are willing to coordinate their efforts a similar direction together.

WHAT IS THE AREA'S GREATEST WORKFORCE/TALENT ISSUE?

In general, stakeholders noted the difficulty of finding good employees in the region, primarily for general labor. The lack of coordination between demand and supply of labor, as well as influence from parents concerning the types of careers that are needed are main areas of concern for talent development in the region.

WHAT FUNDING PROGRAMS ARE AVAILABLE FOR COMMUNITIES LIKE UNION COUNTY TO LEVERAGE FOR USE IN ECONOMIC DEVELOPMENT ACTIVITIES OR TO HARNESS FOR SPECIFIC INDUSTRY USE?

None of the respondents noted awareness of funding programs available for economic development activities or specific industry use.

Group Input Session

Group Input Session

OVERVIEW

Ady Advantage conducted interviews from December 12-13, 2017. The purpose of these interviews was to gain input on a number of topics related to the CV-AV and automotive industry and the region. Each interview was conducted confidentially with a member of the Ady Advantage team. Individuals were asked a variety of questions. The following questions were captured with responses analyzed on the following pages.

1. What are your desired outcomes from this project?
2. What are the area's core industries related to CV-AV, automotive, and the relevant supply chain?
3. What are the area's greatest economic assets related to CV-AV? Why? What's missing?
4. What are the biggest opportunities for growth in the area?
5. What are three assets, programs, clusters, etc. that are missing that will make the area more competitive in CV-AV?
6. What industries or clusters do you think the area is, or could be competitive in?

Group Input Session

ATTENDEES

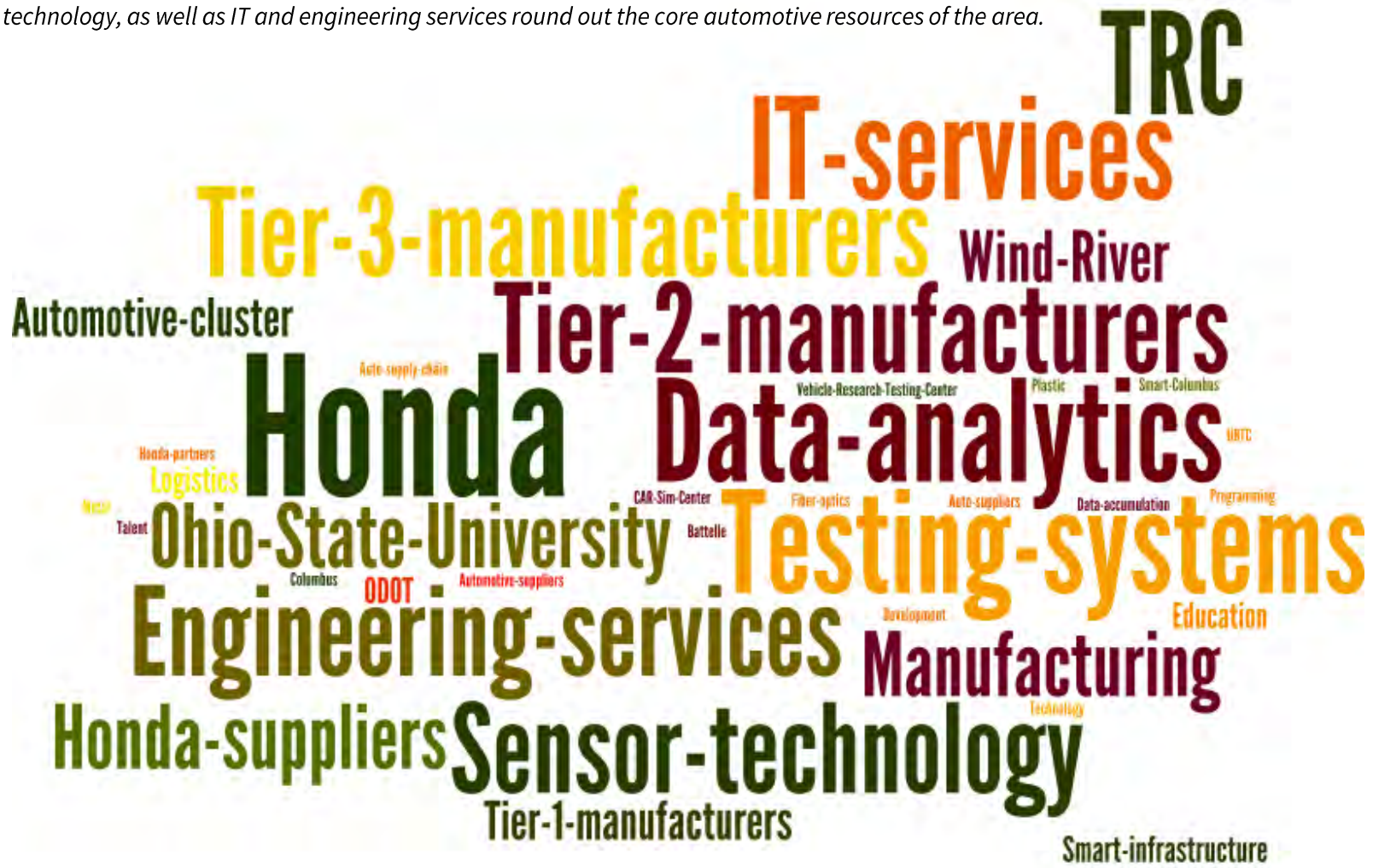
Name	Role	Organization
Eric Phillips	Executive Director	Union County-Marysville Economic Development
Brian Pitzer	President/CEO	Evolve Growth
Dorota Brzezinska	Associate Dean for Research	Ohio State University, College of Engineering
Keith Conroy	Chairman	Union County Community Improvement Corporation
Timothy Seitz	Research & Development Engineer	Transportation Research Center
Jonathan Bridges	Director – Automotive	JobsOhio
Steve Stotte	Commissioner	Union County
Bassam Homsi	President	AutoTool Inc.
Colleen Gilger	Director of Economic Development	City of Dublin
Andrew Bremer	Strategic Initiatives (Smart Mobility)	Ohio Department of Transportation
Todd Spencer	Broker, 33 Innovation Park	Lee & Associates of Columbus
Terry Emery	City Manager	City of Marysville
Matt Howells	Government Relations	Honda of America
Ellen Ahijevych	Plant Manager	Scott's Miracle Grow
Steve Pagura	Real Estate Developer	The Pagura Company
Jason Stanford	Development Services Manager	Union County Economic Development/ Community Improvement Corporation
Donna Goss	Development Director	City of Dublin
Matt McCollister	Vice President of Business Development	Columbus 2020

WHAT ARE YOUR DESIRED OUTCOMES FROM THIS PROJECT?

- Marysville as a leader of smart connect vehicle technology
- How this will impact transportation
- Logistics and Distribution
- Expansion of technology to use in vehicles
- Emerge as a leader from being a connected city and improving safety, efficiency of community and enhancing partnerships
- Be able to accurately sell the assets to prospects
- Responsive to customers: Safety and efficiency
- Coordinated corridor development
- Talent and workforce development
- Emerge as a leader and focus on hi tech jobs
- Story of the assets (collaboration, partnerships, etc.)
- Extended test facility
- Expand economic development opportunity, safety and transportation
- Partnership with public and private, student involvement
- See the larger picture, with this project laying the foundation
- Leader in CV-AV, solid ecosystem to support automotive even with disruption
- Regional impact, partnership capacity, promotion of region
- Key assets to market, definition of what it means and how to market

WHAT ARE THE AREA'S CORE INDUSTRIES RELATED TO CV-AV, AUTOMOTIVE, AND THE RELEVANT SUPPLY CHAIN?

The impact of Honda and the associated cluster of Tier 2 and 3 suppliers to the area cannot be overstated, with several respondents calling Honda a "linchpin" and "King". The Transportation Research Center (TRC) and it's role in testing also plays a strong role in the region. Data analytics, sensor technology, as well as IT and engineering services round out the core automotive resources of the area.



Note: The size of the words in the word cloud represents the frequency of that response. Hyphens between words are used to keep phrases together when generating the word cloud.

WHAT ARE THE AREA'S GREATEST ECONOMIC ASSETS RELATED TO CV-AV? WHY?

Testing resources such as the Transportation Research Center (TRC) and the 33 Smart Corridor were most often mentioned as the greatest economic asset of the area related to CV-AV. The many and diverse research and development partnerships involving public and private entities, as well as the presence of the automotive industry and associated supply chain in the region were also often recognized for their importance. Many of the responses are listed below:

- Unique testing environments in close proximity (TRC, 33 Smart Corridor, Smart Columbus), including 4 seasons of testing weather and the ability to test in urban/suburban/rural environments, as well as on- and off-road
- Research and development partnerships (Ohio State University Centers including the Center for Automotive Research, driving simulator and TRC/Honda)
- Existing automotive cluster and assets, primarily Honda and its suppliers, who provide R&D, workforce development, and drive innovation in the region
- Partner organizations and communities creating an ecosystem/attitude of collaboration (Columbus 2020, Battelle)
- Land for development
- Infrastructure (roads and fiber optics)
- Government partnerships (ODOT, other state agencies, and local) with businesses and support, including through regulation
- Overall costs related to competitor markets
- Innovation incubators and associated funding (Rev1)
- Student co-ops, OSU doesn't support it; other schools do it and are very successful
- Dublin transmission hub
- Diversity of industries CSCC
- Proximity to Columbus metro and OSU

WHAT ECONOMIC ASSETS RELATED TO CV-AV ARE MISSING?

Stakeholders described the dire need for workforce development in the region to meet the demands the CV-AV industry is presenting. There is also a need to develop assets around cybersecurity to support the CV-AV industry.

Note: The size of the words in the word cloud represents the frequency of that response. Hyphens between words are used to keep phrases together when generating the word cloud.

WHAT ARE THE BIGGEST OPPORTUNITIES FOR GROWTH IN THE AREA?

With a focus on innovation, relationships, and messaging of all of the assets under one umbrella; stakeholders realize the huge growth opportunity the 33 Smart Mobility Corridor presents for the area. Opportunities for growth also exist through use of the Transportation Research Center (TRC), the Honda auto suppliers conference previously held in Columbus, using available land in the area, as well as engaging Silicon Valley partners in the region's AV-CV efforts.

Note: The size of the words in the word cloud represents the frequency of that response. Hyphens between words are used to keep phrases together when generating the word cloud.

WHAT ARE THREE ASSETS, PROGRAMS, CLUSTERS, ETC., THAT ARE MISSING THAT WILL MAKE THE AREA MORE COMPETITIVE IN CV-AV?

Among the most notable responses was talent/workforce development to ensure the area continues to be competitive in CV-AV technology development and deployment. Identifying local smart mobility companies and providing means for them to grow was another idea stakeholders believed would create a greater competitive advantage for the region. Improving engagement between citizens and companies, readiness to take on electrification of vehicles, as well as continuing to develop current assets (like existing building/spaces, utilities, and infrastructure) were also often mentioned ideas for making the area more competitive. The main ideas from respondents are listed below.

- People/talent/workforce development to meet industry needs
- Software and app engineering and development side of the business
- Focused, state-level infrastructure and public safety R&D initiative, including high-tech transportation (possibly a research center?)
- Cybersecurity R&D industry
- Engineering and technical degrees
- Entrepreneurship, recruitment and growth of new, nimble companies, including smart technology companies, focused on CV-AV industry
- Citizen & company engagement in automotive technology industry focused on innovation
- Utilities, including strong natural gas utilities, to serve this growing market and the associated manufacturing needs
- Existing building & office space readying
- Ancillary smart mobilities that are not here
- Development of infrastructure and other assets, such as fiber, data (storage, analytics, accumulation), TRC, buildings/space, electrification
- Funding
- State-level, corporate tax break to encourage CV-AV companies to come here rather than Michigan
- Legislation/policy development for AV-CV development at all levels of government that transcends current municipal regulations and coordinates agency actions
- On-road testing and demonstration, as well as a framework to support it
- More coordinated public relations

WHAT INDUSTRIES OR CLUSTERS DO YOU THINK THE AREA IS, OR COULD BE COMPETITIVE IN?

The automotive manufacturing and testing cluster, including associated product and CV-AV development, was most noted as being an industry the region is competitive in. Technology, smart data, and data analytics were also mentioned as competitive industries in the region. Stakeholders believed the region could be competitive in cybersecurity, electrification, high definition mapping, and logistics due to the current assets within the region.

Note: The size of the words in the word cloud represents the frequency of that response. Hyphens between words are used to keep phrases together when generating the word cloud.

SECTION 5: GAP ANALYSIS

Gap Analysis

The following section identifies gaps in Union County's assets by comparing assets from the scorecards with competitor regions. The ratings from each region's scorecards are listed for each criteria (see key at the bottom of the page), as well as an analysis of how Union County compares to its competitors.

Industry	Union County, OH	Ann Arbor MSA	Las Vegas MSA	Comments
Labor and Talent				
Availability of Low-Skilled Labor	▬ ▬	▬	▬ ▬	All three regions have shortages of production labor. MI has a higher concentration of low-skilled labor within the state to draw from than OH or NV.
Availability of Semi-skilled/Skilled Labor	▬	★★	▬ ▬	While there is a local pipeline for skilled labor to feed most of the needs of the CV/AV industry, there is a shortage of this labor in Union County, OH and wages are not as competitive relative to Ann Arbor MSA. Semi-skilled labor was in less demand across all three regions.
Availability of Professional/Technical	▬	★	○	Ann Arbor MSA has the highest wages of any MSA, state and the national average, making their ability to attract and retain this type of talent more competitive. However, much of this type of talent is not relevant to the competitiveness of the CV-AV industry. Supply and demand issues were not noted to be an issue in Union County.
Training Programs	★★★	★★★	★★	All three regions have access to community colleges as a pipeline for semi-skilled labor. Skilled labor pipelines are strong within the state of Nevada, but lacking in the CV-AV industry in Las Vegas MSA. Union County and Ann Arbor MSA both offer exceptional skilled labor pipelines in a variety of disciplines relevant to the CV-AV industry.
Education	★★	★★	▬ ▬	Union County educational attainment rates are slightly more competitive than Las Vegas MSA, and on a state level, than OH. Ann Arbor MSA, has higher educational attainment rates overall, but the lowest percentage of 2-year degree recipients.

★ Marginally Competitive
★★ Competitive
★★★ Very Competitive

▬ Marginally Disadvantaged
▬▬ Disadvantaged
▬▬▬ Significantly Disadvantaged

○ Neutral

Gap Analysis

Industry	Union County, OH	Ann Arbor MSA	Las Vegas MSA	Comments
Infrastructure				
Highway	★★	★★	★	Highway access to Las Vegas MSA, is limited compared with Ann Arbor MSA and Union County. Highways around Union County provide access to more people than Ann Arbor MSA, but Ann Arbor MSAs interstate access exceeds that of Union County.
Available Sites	★	★★	★	All three regions have sites to house CV-AV industry businesses and test CV-AV technology in different environments.
Telecommunications/Connectivity	★★★	★★★	★★★	All three regions have telecommunications capabilities to operate CV-AV technology in rural/highway and urban environments.
Utilities	▬ ▬	▬ ▬	★	Natural gas capacity is an issue for Union County, but electric and water utilities are both competitive. Nevada has water concerns, but competitive gas and electric. Michigan has high gas and electric costs.

★ Marginally Competitive
★★ Competitive
★★★ Very Competitive

▬ Marginally Disadvantaged
▬▬ Disadvantaged
▬▬▬ Significantly Disadvantaged

○ Neutral

Gap Analysis

Industry	Union County, OH	Ann Arbor MSA	Las Vegas MSA	Comments
Regulation and Incentives				
State Regulatory and Permitting	▬▬	★★	★★★	Ohio is considered disadvantaged with regard to best practices for developing state regulations for the CV-AV industry. Nevada has the most current and comprehensive legislation around CV-AV permitting. Michigan lacks the licensing and driver assisted platooning regulation that sets Nevada apart.
Local Regulatory and Permitting	▬	○	★★	Las Vegas MSA has embraced CV-AV technology and provided permitting at the local level to test and deploy technology in different scenarios that improve human/vehicle interaction in the urban environment. Union County is at a disadvantage due to capacity issues in permitting. Ann Arbor local regulatory environment is unknown.
State Incentives	★★	★★★	★	Michigan offers incentives specific to the CV-AV industry, as well as financing for technology startups through all critical phases of development. Ohio offers a wider variety of incentives attractive to CV-AV firms than Nevada.
Local Incentives	★	★★	○	Ann Arbor MSA, was the only region noted to have local incentives to support the CV-AV industry.
State Business Climate	★★★	▬▬	★	Ohio has the best business state climate of all comparison regions, ranking above Michigan and Nevada in almost all criteria except labor supply.

★ Marginally Competitive
★★ Competitive
★★★ Very Competitive

▬ Marginally Disadvantaged
▬▬ Disadvantaged
▬▬▬ Significantly Disadvantaged

○ Neutral

Gap Analysis

Industry	Union County, OH	Ann Arbor MSA	Las Vegas MSA	Comments
Partnerships and Research				
Presence of Partnerships	★★★	★★★	★	Union County and Ann Arbor MSA have numerous partnerships that cover a variety of focal areas of the CV-AV industry. The proximity of Ann Arbor to the Detroit auto industry cluster gives them a competitive advantage in terms of diversity of partnerships that exist.
Regional Research (University/Independent Organization)	★★★	★★★	★★	Union County and Ann Arbor MSA each have unique research capabilities that set them apart. TRC provides a size competitive advantage to Union County's CV-AV industry. However, the proximity of Ann Arbor MSA to the Detroit auto cluster R&D facilities is advantageous for Ann Arbor MSA's diversity and volume of research.
Department of Transportation Policies and Programs	★★	★★	★	The State of Michigan has a strategic plan specific to CV-AV testing and deployment on public roadways within the state that guides programs and projects within the state. The launch of DriveOhio better positions Ohio DOT to provide CV-AV specific policies and programs.
Presence of Strategic Plan	★	★★★	★★	Ann Arbor MSA has a strategic plan that focuses on CV-AV industry growth in Southeast Michigan. There are elements in place for drone usage and guidance for the CV-AV industry in Las Vegas MSA, but Union County does not yet have a specific focus on CV-AV in their strategic plan.
EDO Focus on CV-AV	★★	★★★	★	EDOs in Ann Arbor MSA focus on developing the entire CV-AV entrepreneurial ecosystem, including connections to different levels of investments.

★ Marginally Competitive
★★ Competitive
★★★ Very Competitive

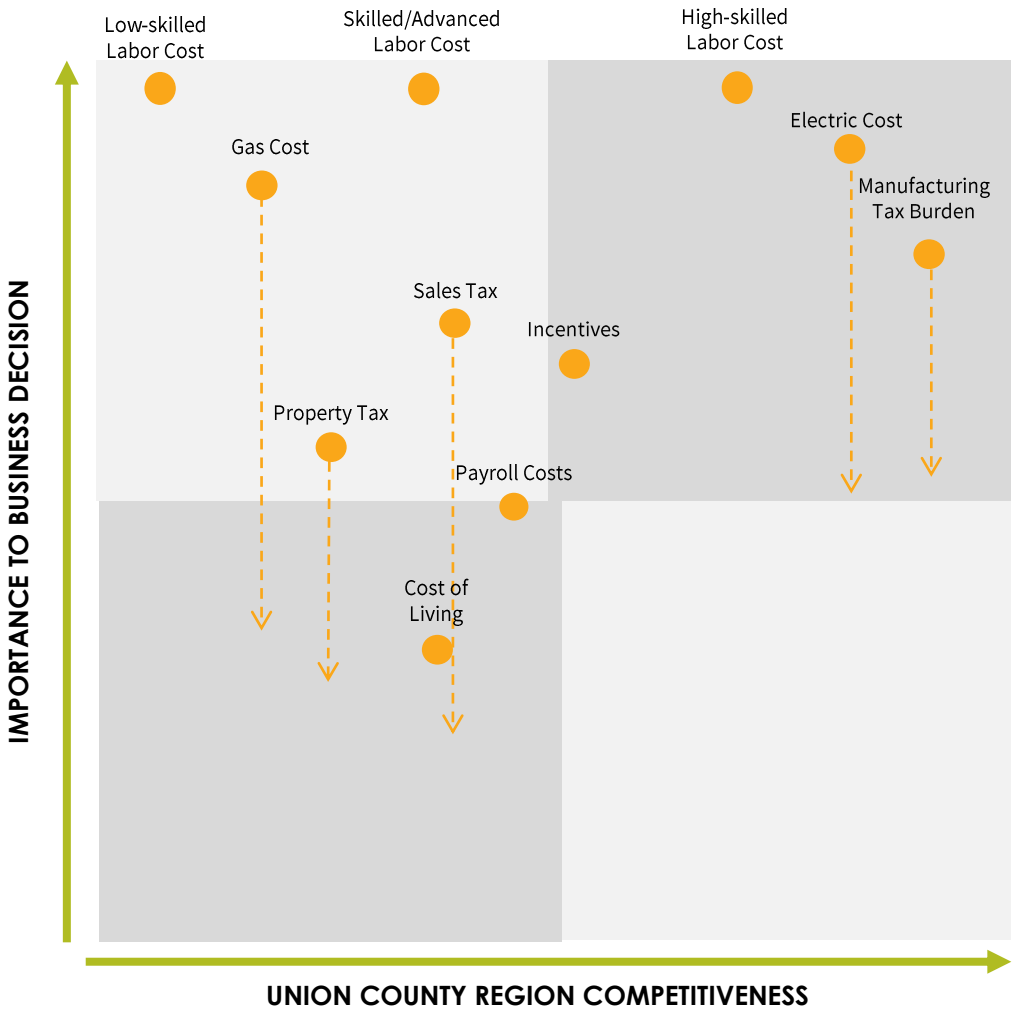
▬ Marginally Disadvantaged
▬▬ Disadvantaged
▬▬▬ Significantly Disadvantaged

○ Neutral

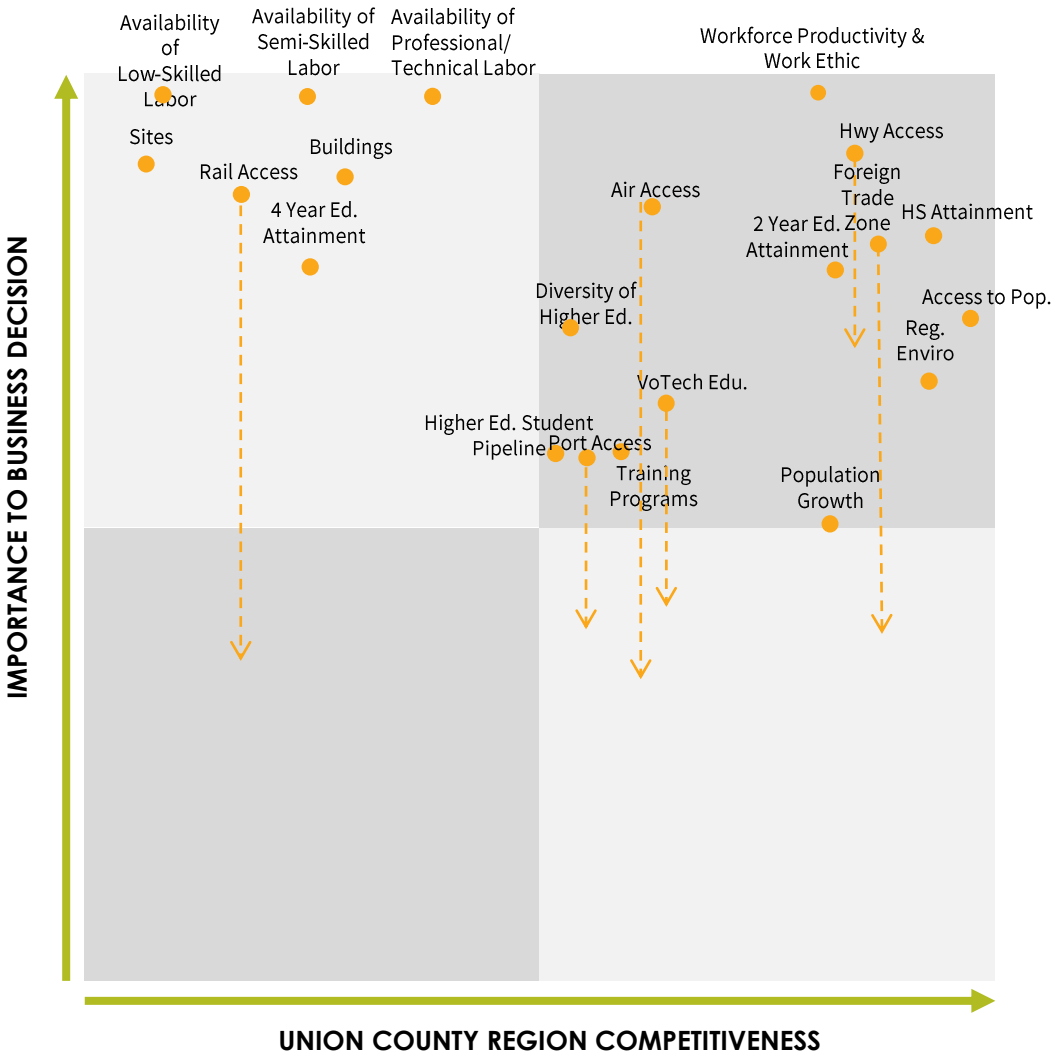
SECTION 6: REGIONAL POSITIONING

Union County Regional Positioning

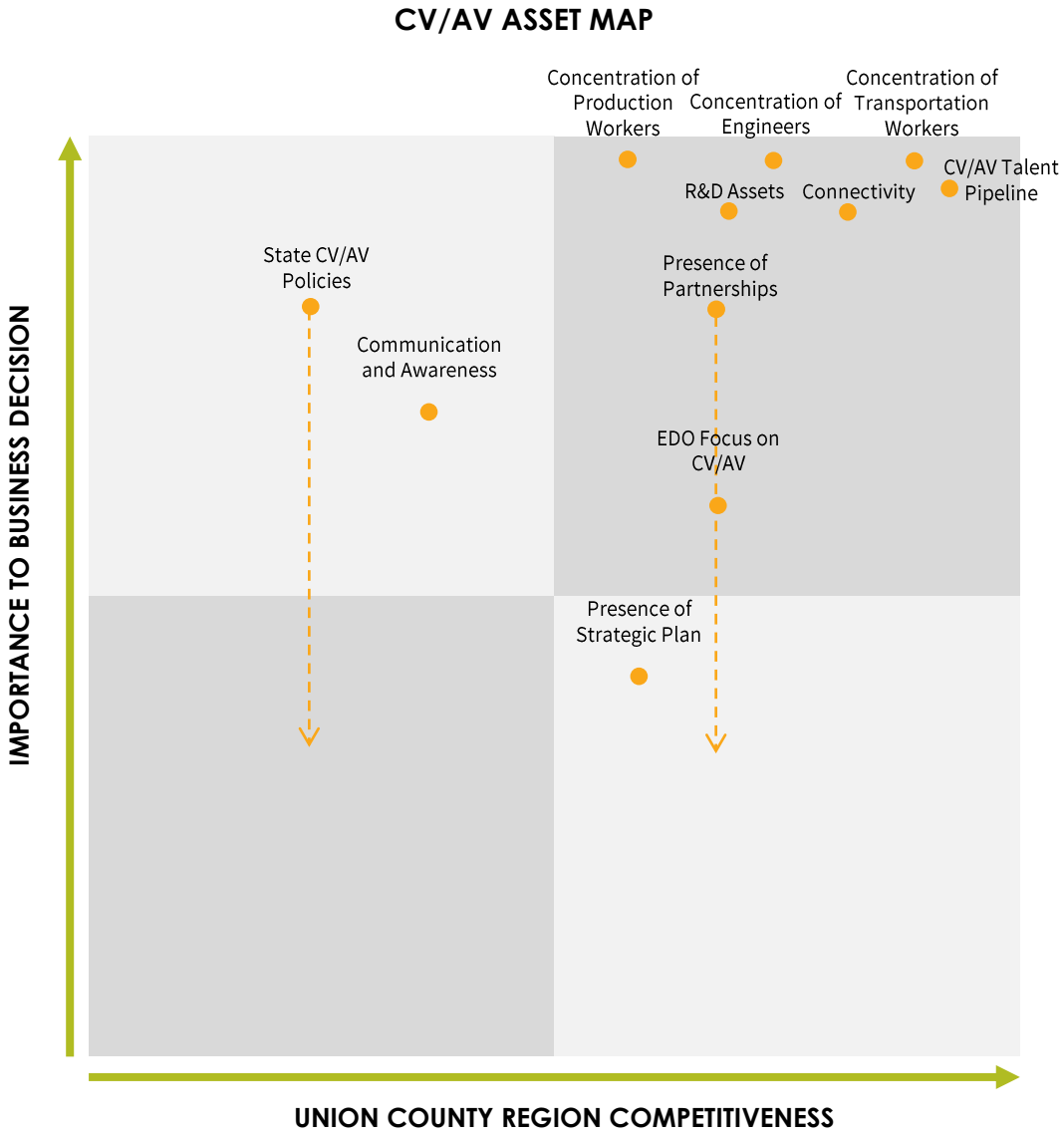
GENERAL BUSINESS COSTS ASSET MAP



GENERAL CONDITIONS ASSET MAP



Union County Regional Positioning



UNION COUNTY PROVIDES THE FOLLOWING INDUSTRY-SPECIFIC COMPETITIVE ADVANTAGES FOR THE AUTOMOTIVE INDUSTRY*:

- **Industry Concentration**
  - Honda and more than 150 automotive suppliers within the region
  - Automotive industry provides $2.4 billion annual regional economic impact and employs 18,000 people.
  - Research (Center for Automotive Research), testing (Transportation Research Center), and translation into manufacturing (EWI) are all located near Union County.

- **Access to a skilled workforce**
  - Access to talent from 25 colleges and universities in the Greater Columbus region.
  - **Columbus State Community College–** Offers Associate degree and certificate programs in academic disciplines serving the manufacturing and logistics, information technology, automotive, transportation and health care industry sectors.
  - **The Ohio State University –** Offers more than 200 majors and has an annual enrollment of over 59,000 each year. Its most popular programs include Bachelor's degrees in Business, Engineering, Social Sciences, Health Professions and Biological and Biomedical Sciences.
  - **High concentration of talent with technical skills to support the automotive industry:**

Concentration of Selected Automotive Industry Occupations	Union County	Columbus MSA	Ann Arbor MSA	Las Vegas MSA	OH	MI	NV
Electrical Engineers (SOC 17-2071)	**2.02**	0.84	0.80	0.39	0.89	1.75	0.44
Industrial Engineers (SOC 17-2112)	**4.07**	1.01	5.48	0.17	1.52	3.42	0.23
Mechanical Engineers (SOC 17-2141)	**7.04**	2.18	2.16	0.16	1.39	4.82	0.28
Team Assemblers (SOC 51-2092)	**9.92**	0.82	1.72	0.29	1.01	3.17	0.46
Assemblers and Fabricators, All Other (SOC 51-2099)	**8.37**	2.52	0.56	0.50	3.41	0.65	0.55
Painters, Transportation Equipment (SOC 51-9122)	**12.19**	1.69	0.66	0.59	1.21	0.88	0.65
Laborers and Freight, Stock, and Material Movers, Hand (SOC 53-7062)	**2.16**	1.43	0.64	1.02	1.14	0.92	1.13
Machine Feeders and Offbearers (SOC 53-7063)	**2.03**	1.59	0.17	0.75	1.20	0.57	0.73

*As identified in Columbus 2020 Deloitte IoT study by Deloitte, June 2017

Union County Regional Positioning

UNION COUNTY PROVIDES THE FOLLOWING INDUSTRY-SPECIFIC COMPETITIVE ADVANTAGES FOR THE AUTOMOTIVE INDUSTRY*:

- **Cost of Operations**
  - No corporate income tax in the state of Ohio
  - Top 5 States for Business (Columbus 2020)
  - New and Mature Capital Intensive Manufacturing Tax Burden(6th and 8th, respectively) (Tax Foundation)
  - New Labor Intensive Manufacturing Tax Burden (9th) (Tax Foundation)
  - Cost of Living Rank (11th) (US News Best States)

UNION COUNTY PROVIDES THE FOLLOWING INDUSTRY-SPECIFIC COMPETITIVE ADVANTAGES FOR THE CV-AV INDUSTRY*:

- **Cybersecurity**
  - Cost of operations 2nd lowest among peer cities
  - Better than US average in terms of workforce availability
- **Hardware**
  - 2nd lowest cost of operations among peer cities
  - Greater than the US average in terms of industry concentration

*As identified in Columbus 2020 Deloitte IoT study by Deloitte, June 2017

Union County Regional Positioning

UNION COUNTY PROVIDES THE FOLLOWING INDUSTRY-SPECIFIC COMPETITIVE ADVANTAGES FOR THE CV-AV INDUSTRY*:

- **Smart Cities**
  - Top rank among peer cities for industry concentration
  - Winner of 2016 US Smart Cities Challenge $50 million award (US Department of Transportation & Vulcan, Inc.)
  - Ohio is ranked 5th for Infrastructure (CNBC America's Top States for Business)
  - Ohio is ranked 7th for Number of Fiber Providers (Broadband Now)

- **The most densely populated part of the US centers around the Columbus Region. Within 500 miles of Union County, companies are able to reach over 131 million people, over 40% of the U.S. population. This includes the large metro areas of:**
  - Chicago, IL
  - New York, NY
  - Detroit, MI
  - Philadelphia, PA
  - Toronto, Ontario

Source: StatsAmerica, 2017

*As identified in Columbus 2020 Deloitte IoT study by Deloitte, June 2017

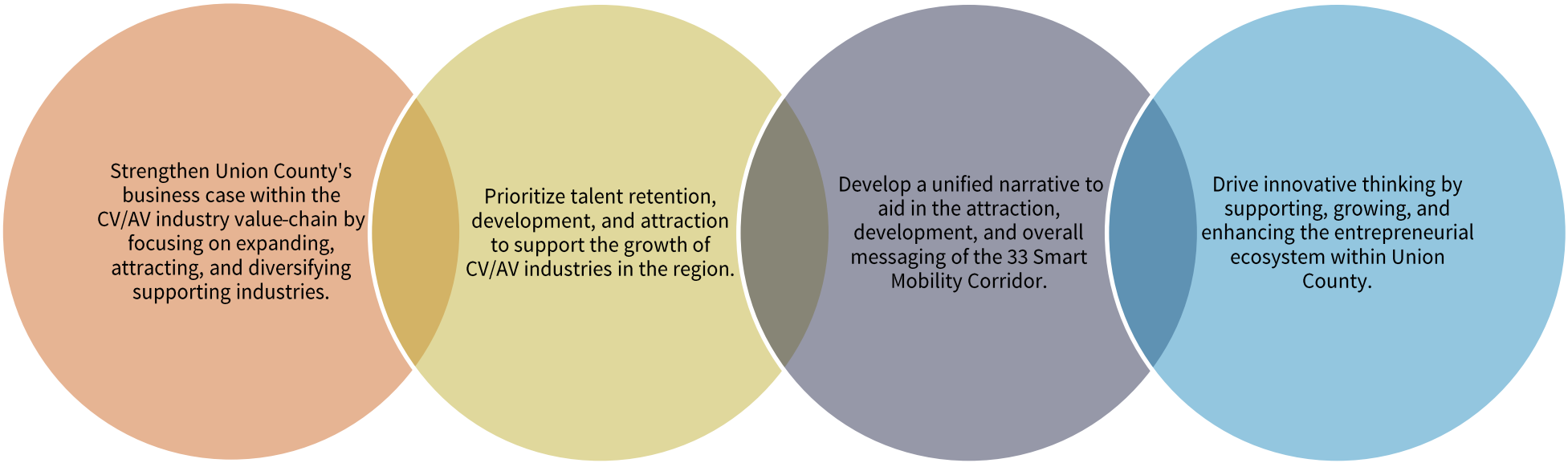
SECTION 7: GOALS FOR THE FUTURE

Goals for the Future

The overarching vision for the 33 Smart Mobility Corridor is to realize the potential of its unique economic assets and strengthen its business case within the CV/AV value-chain by developing greater alignment and readiness. The goals on the following pages are in no particular order. All are considered equally high in importance.

The goals for the future were determined and thoroughly discussed during an remotely facilitated Goals and Visioning work session on Thursday, March 2, 2018. Further input was gathered by individuals unable to attend through a goal survey distributed to individuals following the work session. The survey was closed on Friday March 30, 2018.

During the work session, we discussed certain gaps identified in the three main categories of alignment/regionalism, readiness, and marketing/differentiation. Those gaps then drove the discussion on what goals the 33 Smart Mobility Corridor area would like to achieve in the near future. These goals will be discussed further in the following pages and will serve as the basis for the Economic Development Strategic Plan in the last section of this report.



INTEGRATED TACTICS

As an effort of integration of this strategic plan, select elements have been integrated from the 2014 Union County Economic Development Strategy (economic development strategy) into this strategic plan.

Each of the four goals from the 33 Smart Mobility Corridor strategic plan are aligned with four key strategies found in the economic development strategy. The following table sows the evolution of the 2014 stated goal to the 33 Smart Mobility Corridor strategic plan's goals. The essence of attract, retain, create, and improve was kept; however, the area of focus has changed to reflect the narrowed focus on smart mobility and the CV/AV industry.

2014 ECONOMIC DEVELOPMENT STRATEGY GOAL	33 SMART MOBILITY CORRIDOR STRATEGIC PLAN GOAL
Attract employers to the county to diversify the economic base	Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.
Retain and grow the economic base through outreach to existing businesses in Union County	Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.
Create more high-growth enterprises by leveraging the County's entrepreneurs and creating new entrepreneurs.	Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.
Improve the civic infrastructure by providing an environment that supports economic growth and strong communities	Drive Innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.

Goals for the Future

ATTRACT

Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.

The essence of attracting new business to the region was maintained. However, the focus area is on growing and expanding those industries that will support the CV-AV value-chain.

RETAIN

Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.

Retention shifted from focusing on outreach to prioritizing talent strategies across the region. This will help enable and foster growth within, at the same time, increase the capacity for more sustainable recruitment.

CREATE

Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.

Create was modified to reflect the need to focus on leveraging the area's assets, in all forms, to build a unified narrative that can be used to share a compelling story with all audiences.

IMPROVE

Drive innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.

Improve evolved from a focus on civic infrastructure to narrowly focus on the entrepreneurial ecosystems that have been developed and enhanced that can support the growth of the CV/AV industry while also forming a key part of the unified narrative.

INTRODUCTION

The following pages provide each articulated goal along with discussion that was captured during the goals and visioning workshop. The discussion components represent the comments and insights shared by attendees. Whenever attendees shared overwhelmingly similar viewpoints these were reported collectively and aggregated into one point. This section serves to showcase, more generally, the feedback from attendees and how they were organized and fit into each of the four goals. The discussion points do not represent verbatim responses, but instead capture the essence of what was articulated by stakeholders.

***

THE GOAL

Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.

DISCUSSION

- Ensure the area is on the cutting edge of technology. Especially technology that can provide advantages to CV/AV and smart mobility industries.
- Focus on those areas within the CV/AV industry where the 33 Smart Mobility Corridor can be most competitive. It is important to define what those areas of focus will be.
- Be sure the technology park is developed and ready to recruit new projects.
- All partner should be aligned in the same effort to attract and recruit new CV/AV companies to the area. This means enhancing communication and collaboration among all partners, local, regional, and state.
- The attraction of new companies should support the diversification of industries in the area.

THE GOAL

Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.

DISCUSSION

- Developing talent is important. There should be a multi-faceted approach to talent initiatives, including those that focus on K-12, career-tech, and higher education.
- Talent initiatives should include area businesses to identify what their needs are especially within the CV/AV industry.
- Retention should be a particular focus. The area is surrounded by educational institutions that provide a steady stream of talent, which are important and relevant to the growth and attraction of the CV/AV industry. It is important to retain or recruit this talent to the area.

THE GOAL

Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.

DISCUSSION

- Align the marketing efforts of the area.
- Create a solid marketing plan that will help develop a message that will resonate with businesses and site selectors.
- The message should capture the assets of the area and tell audiences the marketability of the area as a leader in research, smart mobility technology, and a connected network for testing and proving.

THE GOAL

Drive innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.

DISCUSSION

- Innovation can help support the area's value proposition to attract and grow CV/AV industries. Building an ecosystem that supports entrepreneurism and innovation will help develop the kind of environment that will support this kind of growth.
- There are different assets and opportunities that will help facilitate this kind of thinking in the area. It ranges from maker's spaces, innovation centers, incubators, focused conventions or activities that bring in thought leaders or industry experts, etc. This can help foster a culture around innovation. Innovation will lead to emerging technologies that will ultimately grow and support companies focused on CV/AV and smart mobility technologies.

"Stakeholders in breakout groups discuss the 33 Smart Mobility Corridor's key assets during Ady Advantage's on-site visit in December 2017"

SECTION 8: ECONOMIC DEVELOPMENT STRATEGIC PLAN

SECTION 8: ECONOMIC DEVELOPMENT STRATEGIC PLAN

Economic Development Strategies

INTRODUCTION

Within this section are the main strategies for the 33 Smart Mobility Corridor. Strategies are defined as items necessary to fulfill one or more of the strategic goals identified in Section 7. They are more detailed than goals but not as detailed as specific tasks.

As you will see on the following pages, each of the strategies has a specific effect on one or multiple goals; however, the effect the strategy has on the particular goal varies from primary effect to direct effect to indirect effect.

These strategies will be broken down further into specific tactics within each strategy in the following section.

Also of note, each of the strategies is categorized into four areas of focus.

1. **Roles and Responsibilities:** Strategies completed in this area of focus should lead to key designations around specific stakeholders, groups, organizations, etc. that have the capacity and ability to impact outcomes related to the 33 Smart Mobility Corridor strategic goals. These strategies help to create and build a foundation for the succeeding strategies to be successful.
2. **Partnership Development:** This area of focus aims to create and enhance the existing network for economic development. Focusing on building and maintaining partnerships will create an important piece of the overall framework to create a more competitive region for the growth and expansion of CV/AV industries. Partners will also be essential in implementing many parts of the overall strategic plan.
3. **Readiness:** Within this area of focus, strategies are set out to develop and enhance the area's overall readiness in three discrete activities: product pipeline development, talent initiative development, and innovation culture building. Product readiness aims to ensure a strong and shovel-ready site pipeline for the growth, expansion, and attraction of new and existing businesses. Talent readiness seeks to curate tailored and mixed initiatives to build a solid workforce for new and existing growth. Finally, innovation readiness attempts to build a culture that supports unique and original ideas around the CV/AV industry to support disruptive thinking and enhance the area's positioning overall in the CV/AV industry.
4. **Messaging & Narrative Building:** This area of focus is designed to foster clear and articulated expectations around communicating key messages highlighting the competitive positioning of the 33 Smart Mobility Corridor. It does this through development of a framework to create a tailored and unique narrative that captures the essence of culture, progress, networks, partnerships, and assets that make-up the overall ecosystem within the 33 Smart Mobility Corridor.

KEY PERFORMANCE INDICATORS

Key performance indicators (KPIs) are specific criteria identified that are designed to measure the success or progress of the economic development growth plan. Therefore, these indicators are measurable, based on the goals determined by the Union County Economic Development Partnership (EDP), and can be realistically improved upon over time based on specific actions outlined within the strategic plan. KPIs are divided into those over which the Union County Economic Development Partnership has direct control, and those outcomes in the county that its efforts are intended to ameliorate. The list below provides a broad overview of KPIs. Included in the Implementation Map are specific KPIs informed by each strategy.

Union County Economic Development Partnership's key performance indicators (measures that EDP can impact directly) include:

- Number of BRE interviews conducted annually
- Increased reach and engagement, as measured by analytic data, of business attraction marketing tools
- Number of sites/total acreage available for investment and competitive/ready for desired uses
- Number of projects for which EDP provided project support or oversight (BRE or attraction)
- Number of RFI/RFPs received, fit of projects responded to relative to EDP's goals, number that result in a site visit, number of project wins
- Number of entrepreneurs participating in Pitch Week.

Success indicators the Union County Economic Development Partnership (measures that EDP cannot impact directly) include:

- Number of existing CV/AV companies, jobs, and/or investment retained and grown in the area
- Alignment among EDP and partners involved in the area's economic development – degree of coordination, information sharing, clarity of roles, etc.
- Level and percent increase in average wages
- Diversity and growth of CV/AV industry sub-sectors
- Employment retention/growth relative to index (i.e., whether Union County is maintaining or growing market share in a sub-sector at a level equal or above the national average)
- Time required and business-friendliness to get through permitting, zoning, and incentives approvals
- Improved ability to recruit employees locally – measured qualitatively from existing employers
- Increased innovation capacity – measured by programming availability in the area
- Number of new start-ups and success rate and relative focus on CV/AV

ALIGNMENT/REGIONALISM				
	Goal #1: Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.	Goal # 2: Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.	Goal #3: Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.	Goal #4: Drive innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.
Roles and Responsibilities				
Develop a matrix that outlines and clearly defines the role of each partner in the implementation and execution of the strategic plan and responsibility for supporting the growth of the CV/AV industry.	XX	XX	XX	XX
Develop an understanding of the types of CV/AV projects that Union County will prioritize and how these will be incented.	XXX	X	X	
Develop a communication protocol for prospects and businesses.	XX	X	X	X
Partnership Development				
Facilitate partnerships between supply and demand side of talent.	XX	XXX	X	
Build relationships with OEMs and other major suppliers.	XXX	X	X	X
Maintain and deepen existing partnerships.	XX	XX	XX	X

XXX: Primary effect on goal **XX:** Direct effect on goal **X:** Indirect effect on goal

READINESS				
	Goal #1: Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.	Goal # 2: Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.	Goal #3: Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.	Goal #4: Drive innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.
Product Readiness				
Create an inventory of all sites and buildings available, getting and maintaining up-to-date information	XX	X	X	
Prioritize sites and buildings based on priority projects and best business case within the value-chain.	XX	X	X	X
Understand and develop the product pipeline.	XX	X	X	
Advocate for infrastructure improvement where it enhances and supports the CV/AV industry and Union County's competitiveness.	XX	X	XX	X
Talent Readiness				
Identify existing and planned initiatives from all relevant groups.	XX	XXX	XX	XX
Determine talent needs from existing employers.	X	XXX	XX	X
Build a talent strategy around existing and future needs for talent.	XX	XXX	XX	XX
Innovation Readiness				
Identify and define current resources available for start-ups	X	X	X	XXX
Create awareness around current resources.	X	X	XX	XXX
Curate a uniquely branded program that showcases talent, opportunities, and entrepreneurial activity in Union County.	X	X	XX	XXX
Support and facilitate innovative touchpoints within the area.			X	XXX

XXX: Primary effect on goal **XX:** Direct effect on goal **X:** Indirect effect on goal

MARKETING/DIFFERENTIATION				
	Goal #1: Strengthen Union County's business case within the CV/AV industry value-chain by focusing on expanding, attracting, and diversifying supporting industries.	Goal # 2: Prioritize talent retention, development, and attraction to support the growth of CV/AV industries in the region.	Goal #3: Develop a unified narrative to aid in the attraction, development, and overall messaging of the 33 Smart Mobility Corridor.	Goal #4: Drive innovative thinking by supporting, growing, and enhancing the entrepreneurial ecosystem within Union County.
Messaging-All Audiences				
Use data from economic development plan to identify points of differentiation and develop marketing collateral to communicate this.	X		XXX	
Narrative Building				
Develop marketing collateral based on the CV/AV industry and begin building the Union County narrative.	XX	X	XXX	
Leverage marketing presence and initiatives of Columbus 2020	XX		XX	
Develop a unified message that can be used by regional stakeholders to promote and sell the 33 Smart Mobility Corridor.	XX	X	XXX	X

XXX: Primary effect on goal **XX:** Direct effect on goal **X:** Indirect effect on goal

Implementation Map

INTRODUCTION

The implementation plan builds off of the same strategies found on the previous pages by including additional tasks identified to accomplish each strategy. Again, these strategies are key to achieving the Economic Development Partnership's goals. The strategies from the previous section are highlighted in gray in each of the tables, and then broken down further into actionable tactics.

Through various discussions and experience, we have articulated the following for each task:

- Responsible party
- Priority
- Timeline
- Budget Estimate
- Key Performance Indicators

These criteria will help determine which of these tasks should be accomplished first and who should be responsible for the completion of each.

Economic Development Ecosystems are built on strong and collaborative partnerships. A strong foundation in economic development partners creates greater alignment and tends to foster better readiness and regional thinking, culminating in stronger points of differentiation. For the implementation of the 33 Smart Mobility Corridor strategic plan, the following partners have been identified, but should not be limited only to those mentioned:

- Union County-Marysville Economic Development Partnership
    - Chamber of Commerce
    - Community Improvement Corp.
    - Union County-Marysville Port Authority
- TRC
- The Ohio State University
- Columbus State Community College
- Ohio University
- Career Technical Centers
- PK-12
- Other Higher Education Institutions
- Area Businesses
- Council of Governments
- ODOT
- DriveOhio
- JobsOhio
- Columbus 2020

Implementation Map

The following is a sample of the implementation map. The full implementation map, which includes all of the strategies and tactics, is provided as a separate document. The map can be edited and customize to tailor Union County's priorities for each strategy. The implementation map provides a mechanism for tracking progress as well as guidance prioritization, timing, budget impact, and accountable groups.

ALIGNMENT/REGIONALISM				
Roles and Responsibilities	**Responsible Party**	**Priority**	**Timeline**	**Budget**
Develop a matrix that outlines and clearly defines the role of each partner in the implementation and execution of the strategic plan and responsible for supporting the growth of the CV/AV industry.				
Inventory all partners that will be needed to implement or support the economic development strategic plan. Complete this inventory internally before bringing in boards or other related partners.	Union County-Marysville Economic Development Partnership (EDP)	High	Q2 2018	Staff Time
Define the role that each organization or group will have in the support and implementation of the plan. Start by identifying the roles each of the partners currently have in supporting economic development. Then, articulate their role as direct or indirect. Next, determine if the direct groups will actively implement/support or passively impact the plan. Finally, determine if there are any gaps in the mapped responsibilities and match the most relevant group(s) that can best complete these gaps.	EDP	High	Q2 2018	Staff Time
Update and refresh the matrix as needed. The document should be kept simple and easy to read to ensure outside stakeholders can clearly understand their role in the plan's implementation.	EDP	Medium	Ongoing	Staff Time
Gather buy-in from identified groups and organizations by soliciting "sign-offs" on the final accountability matrix.	EDP and relevant partners	High	Q2 2018	Staff Time

About Ady Advantage

Published by Ady Advantage, a comprehensive and integrated economic development market research, site selection, and marketing consulting firm. Our experience on both sides of the economic development equation is unique. It gives us important insight into the perspectives, challenges, and sensitivities of both manufacturers and economic development organizations, bringing added value to both. And we're the only such firm that not only makes marketing recommendations, but also helps you build your website, market to prospective businesses, and use social media as a competitive advantage. Our corporate services focus on helping manufacturers, utilities and other sectors grow their businesses through an integrated solution set that includes research, competitive positioning, marketing strategy, integrated communications, and facility expansion.

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