

Pittsburgh

Robotics Cluster

Profile

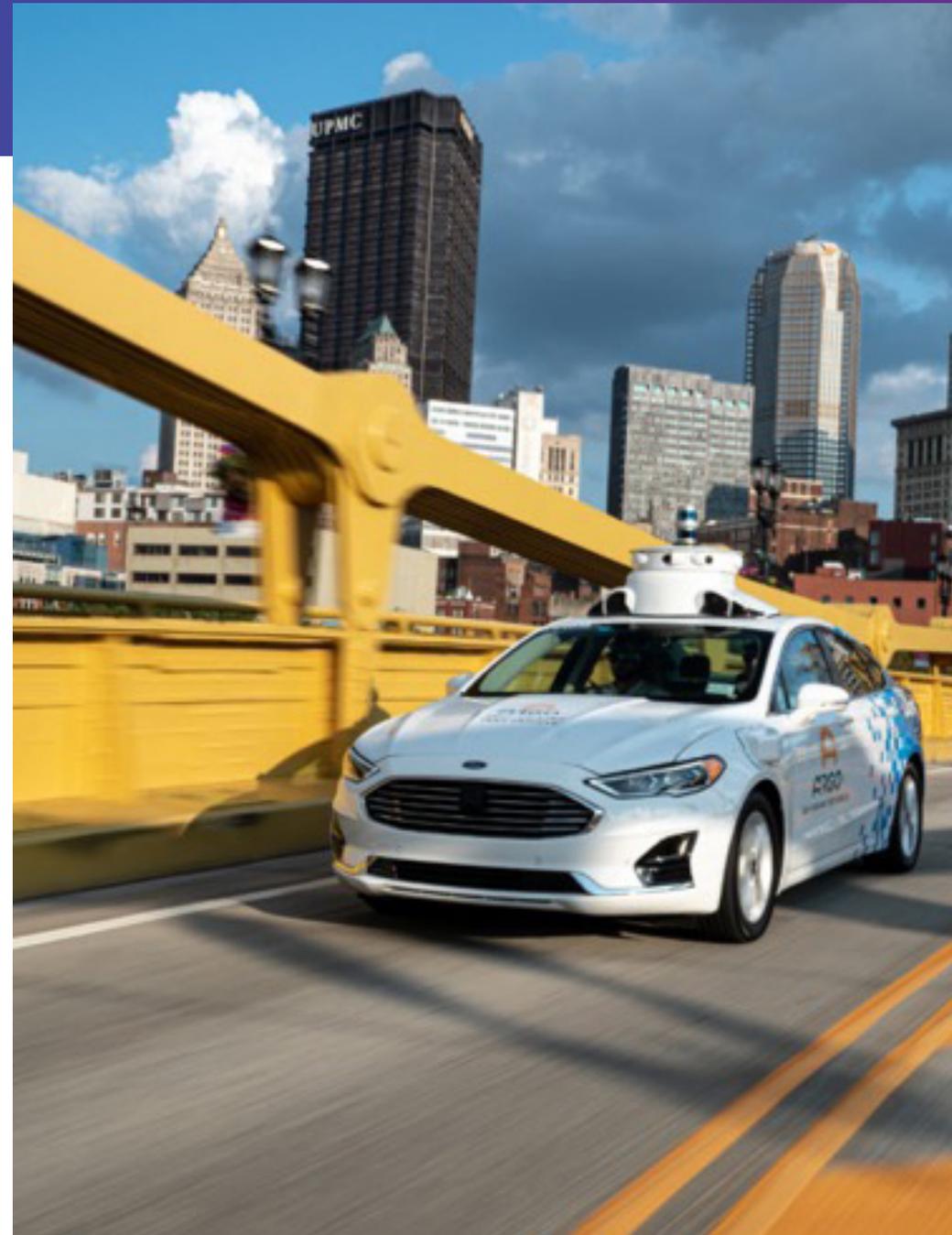


An Invitation

This is such an exciting time to be in the robotics and autonomous systems sector and there is no better place to be experiencing its transformational power and promise than Pittsburgh. There is a long history for the sector here, built on the long-standing leadership of Carnegie Mellon University, combined with astonishing momentum in the development and growth of our robotics and autonomy industry. The region has an intellectual community that is on the bleeding-edge of robotics advancement and a proven track record in commercializing its R&D-based innovations. Skilled talent is both produced here and moving here to fill growing job opportunities generated by a full-stack of technology ventures in robotics and autonomous systems. The regional ecosystem is also home to manufacturers, distributors, service providers, and support systems necessary to build and grow a robotics company.

Those of us already here love it, and we expect you will too. Authentic, balanced, diverse, dynamic, fun and quite stunningly attractive (come and see) – Pittsburgh is a fabulous place to live and work. We are organized and ready to help you discover the powerful opportunities, assets, and ecosystem that awaits you in the Pittsburgh region. This Cluster Profile introduces our leading position in robotics and autonomous sector development, but it is only a starting point for a deeper conversation about why you should join us. Please get in touch. We would love to hear from you.

**Joel Reed, Executive Director
Pittsburgh Robotics Network**



Key Facts

Inventing, testing, building –

Pittsburgh is leading the world in the development and commercialization of robotics and autonomous systems



TALENT

>9,000 annual graduates in relevant fields.
#1 ranked doctoral program in robotics is at Carnegie Mellon University.



INVESTMENT

\$4.3B including in corporate and venture capital investment in the last 5 years (2017-2021)



INDUSTRY CLUSTER

>7,000 direct personnel across more than 100 robotics and autonomy employers.
>14,000 total servicing the sector.



INFRASTRUCTURE

\$491M in recent ecosystem Investments in R&D, testing, piloting and demonstration facilities.



TECH STACK

Diverse industry presence across the full tech stack and 18 industry verticals



R&D FUNDING

\$163M in U.S. federal research funds for robotics and autonomy research in Pittsburgh (2015-2020)



ORGANIZATION

Pittsburgh Robotics Network coordinating access to dozens of specialized support programs

Unstoppable Momentum

Powering forward, Pittsburgh's robotics and autonomous systems sector is expanding and innovating at an astonishing pace. You can be part of this groundbreaking ecosystem.

Pittsburgh was leading in robotics long before it became popular. The field is embedded in the DNA of modern Pittsburgh. This region's excellence in robotics has expanded far beyond its already impressive foundation, continues to grow at an unparalleled rate, and as a result, is recognized as "the" place to be for robotics and autonomous systems.

Robotics engineering, and the AI and software systems that drive autonomy forward, are advancing at a quickening pace as is Pittsburgh's robo-economy. Already recognized as an innovative leader for decades, Pittsburgh's trajectory accelerated the last few years with multi billion-dollar investments, new business formations, strategic partnerships, and major infrastructure investments that make the region's momentum impossible to ignore.



Over \$7.6 billion
in recent investment in Pittsburgh
robotics companies, supporting
infrastructure, and university R&D.

The Industry Cluster

Pittsburgh offers a highly diverse base of companies spanning the full stack of technologies and industry verticals. You will find your interests represented here.



CHANGING THE WAY WE LIVE

CONSUMER PRODUCTS



EDUCATION



HEALTHY LIVING



CONDUCTING RESEARCH



CHANGING THE WAY WE WORK

AEROSPACE & DEFENSE



CONSTRUCTION



MANUFACTURING & INDUSTRIAL



INSPECTION & MAINTENANCE



HEALTHCARE



RETAIL



MINING



DELIVERY



MACHS ROBOTICS



WAREHOUSE & LOGISTICS

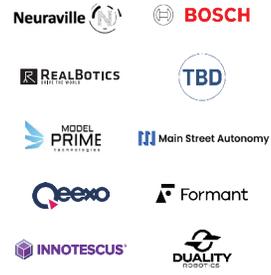


AGRICULTURE



ENABLING AUTONOMY

AI & SOFTWARE



COMPONENTS



INTEGRATED SYSTEMS



BUILDING THE ECOSYSTEM



The Global Epicenter For Autonomous Vehicles

Global leaders in autonomous vehicles recognize the role that Pittsburgh plays in this industry. Big companies and big investments find their way here.

Pittsburgh has become THE go-to place for the fast-growing autonomous vehicles industry. The superb R&D environment, network of leading players, and supporting excellence of Carnegie Mellon University has generated magnetic attraction for pioneers in autonomous vehicles.

Leaders headquartered here, or making Pittsburgh a leading development hub, include Aurora, Argo AI, Locomotion, Motional, and Waymo. Large-scale capital investments have come in from key automotive OEM's that see Pittsburgh's ecosystem as uniquely well-structured to advance their autonomy ambitions.



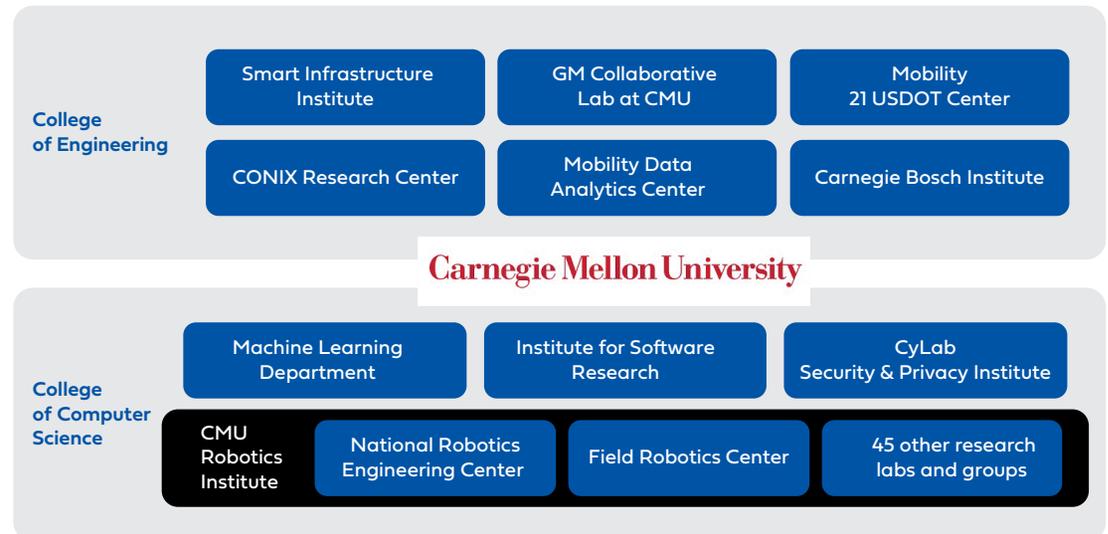
There are powerful knowledge and tech spillovers from the AV cluster, even if it is not your focus area in robotics.

Intellectual Excellence

This is the intellectual home of robotics, autonomous systems, and AI. Carnegie Mellon University sits at the center of a unique R&D and talent development breeding ground.

Pittsburgh is the birthplace for much of the research advancement that drives the robotics, autonomous systems and AI sectors and has been the training ground for many of those who populate other robotics clusters and academic institutions around the globe.

At the heart of it all is Carnegie Mellon University, which has long been at the center of robotics excellence and is an acknowledged leader in associated computer science and engineering disciplines. Pittsburgh's robotics and autonomy ecosystem is populated with countless industry leaders, research scientists, and engineers with graduate degrees earned at Carnegie Mellon University, and the base of talent here is further reinforced by engineering and computer science at the University of Pittsburgh, Pennsylvania State University, and many other regional universities and colleges.



Regional Competencies:
 Computer Science,
 Sensing & Perception,
 Autonomy, Artificial Intelligence,
 Field & Service Robotics,
 Human-Centered Robotics,
 Manipulation & Interfaces, Robot
 Structures, Robotics Foundations

A Magnet For Worldclass Talent

The region is a hotbed for robotics, autonomy, AI, and other critical talent.

Talent today, and talent for the future – it's a Pittsburgh promise.

Attracting and retaining talented people is key to success in the robotics and autonomy sectors. Pittsburgh is laser focused on producing the skilled personnel needed to advance its strategic technology sectors – and robotics and autonomy is at the top of that list.

Our universities and colleges are educating world-class students in robotics, engineering, computer science, AI, cybersecurity, and the full-range of disciplines needed across the technology stack. The region also boasts a deep bench of mechanical and electrical engineers needed to develop hardware platforms - a key differentiator over other technical hubs.

A key advantage now for Pittsburgh is the powerful critical mass of employers in the sector, providing skilled talent with assurance that there are, and will continue to be, abundant job opportunities when they move in and set down roots.

Talented, innovative, and creative people love it here. It is simply a great place to learn, live, raise a family, and advance a career.

ANNUAL GRADUATE OUTPUT

386 Robotics & Mechatronics degrees

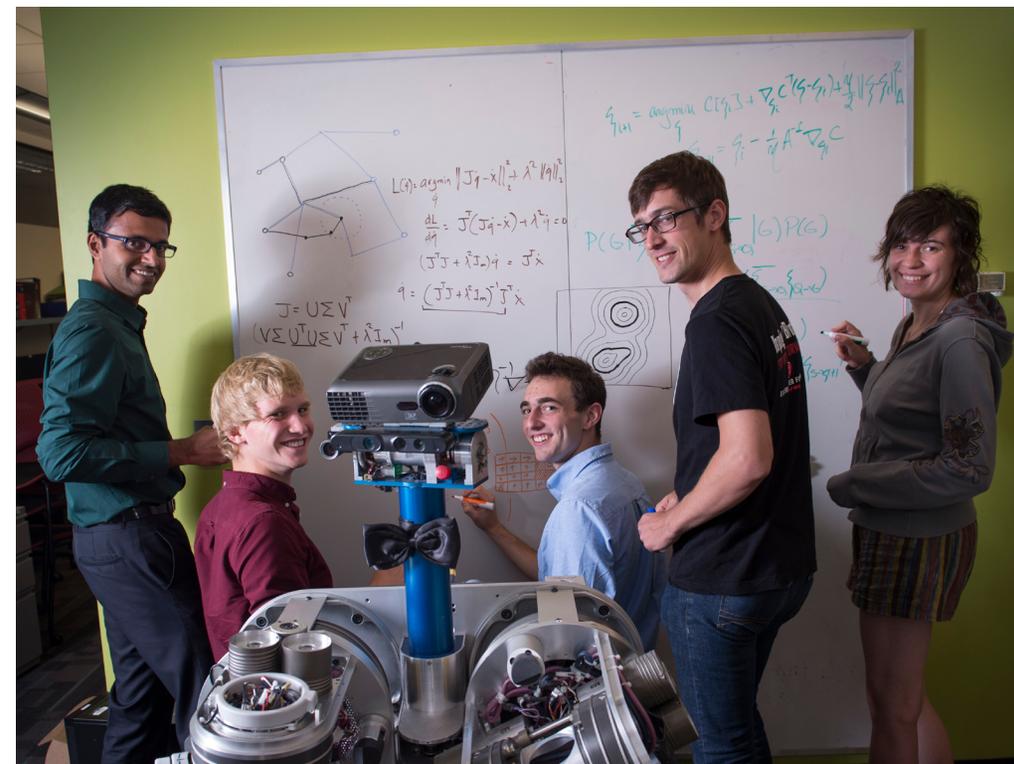
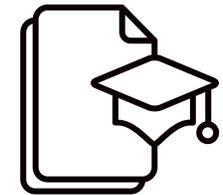
327 AI degrees

1,676 Computer Science degrees

1,672 Computer Engineering degrees

2,688 Mechanical Engineering degrees

2,430 Electrical/Electronic/ Communications Engineering degrees



An Entire Value Chain

Coming-up with ideas is important, but so too are implementing them, building an enterprise around them, and launching tangible products and services. Doing so requires access to a place that can support the needs of operations across the **entire value chain**. Pittsburgh is that place

R&D is a core element of the Pittsburgh robotics ecosystem, but it is just one part of a much wider suite of competencies. The region's rich industrial history has built a base of talented companies when it comes to prototyping, building, assembling, and distributing complete robotic systems.

Whether you need to develop component parts or working prototypes or move into full-scale manufacturing of advanced robotics components and systems, Pittsburgh and the broader region provides great opportunities to connect to specialized suppliers and development partners.

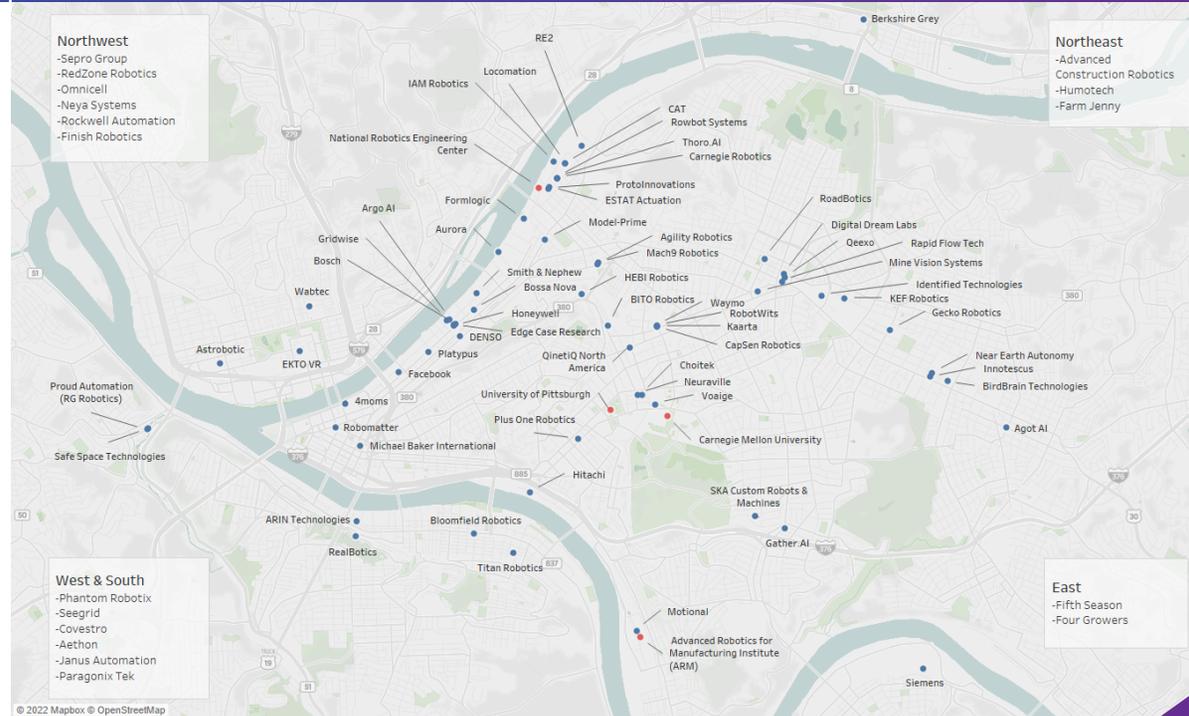


Sites & Infrastructure To Suit

There's a **great choice of locations**, premises, and specialized infrastructure well-suited to robotics sector needs.

The Pittsburgh region has diverse sites and facilities well-suited to the needs of robotics and autonomous systems companies. From high tech office space, to high bay innovation and fabrication space, the regional development community has paid attention to assembling sites that are ideal for the diverse and specialized needs of the industry.

The region is also paying attention to the infrastructure for connected vehicles, development of test facilities and test tracks, geofencing corridors for special piloting projects, and other key public/private infrastructure and access to public resources needed for success.



Companies have clustered close together in the city, with good access to each other, the universities, and a large and diverse number of support organizations.

A Complete Ecosystem To Support You

Pittsburgh has a **complete ecosystem** of connected organizations that will work hard to optimize the robotics environment

Whether you are building a new enterprise or relocating a component of your business to a new city it's reassuring to know that there is a complete ecosystem of supporting organizations ready to meet your needs.

These organizations are connected to each other as an organized system with the **Pittsburgh Robotics Network** serving as a well-coordinated one-stop-shop to connect you to any of the ecosystem's services, providing the support you may need.

Ecosystem Element	Ecosystem Element Providers														
	Autonomy/Robotics Specific Organization or Dedicated Sector Services Evident	Primary Provider	Secondary Contributor	Sector Businesses	Research Universities	Pgh. Robotics Network	Pittsburgh Tech Council	Innovation Works	AlphaLab/AlphaLab Gear	Catalyst Connection	ARM Institute	Pgh. Regional Alliance	RIDC	Greater Pgh. Chamber	The Allegheny Conference
Basic Research	★	☆		☆	★										
Applied Research		★		★	★										
Product Innovation and Development		★		★	☆										
Piloting and Testing Facilities & Services		☆		☆											
Accelerator Services					⚙️				⚙️		⚙️				
Office/Flex/Mfg. Space Development/Leasing													⚙️		
Entrepreneurial Development & Mentoring		☆		☆	⚙️	☆	⚙️	⚙️	⚙️	⚙️	⚙️				
SBIR/STTR Assistance and Coaching					⚙️										
Pre-Seed/Seed Capital					⚙️			⚙️							
Venture Capital								⚙️							
Supply Chain Development and Mfg. Support		☆		☆	⚙️		⚙️	⚙️		⚙️					
Education & Workforce Development Services					★		⚙️								
Networking & Intellectual Exchange		☆		☆	☆	★	⚙️							⚙️	⚙️
Public Policy & Government Affairs		☆		☆	⚙️	☆	⚙️							⚙️	⚙️
Business Attraction and Marketing		☆		☆		☆	⚙️					⚙️	⚙️		⚙️

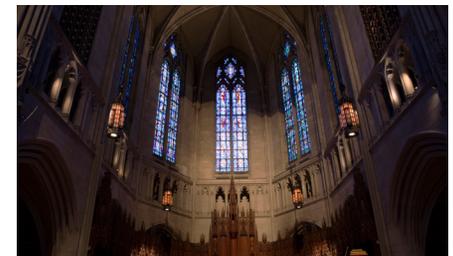
A Vibrant And Dynamic Region

The Pittsburgh region is a **GREAT place to be.** Affordable, authentic, fun, cultural, welcoming, techy, and diverse, with recreational and entertainment assets and so much more.

Once visited, never forgotten. From the dramatic downtown at the confluence of three rivers, to the green hills, valleys, and distinctive neighborhoods, it has a special vibrancy that just has to be experienced.

Housing is high quality and affordable and served by great school systems across a variety of welcoming communities. Outdoor recreational opportunities abound including boating on rivers and lakes, caving, an extensive biking and hiking trail network, and downhill skiing and whitewater rafting in the beautiful Laurel Highlands. There is no shortage of world-class cultural, entertainment, and professional sports options to enjoy.

You'll also find that robots are everywhere in the Pittsburgh region – in the air, on roads and underground; in our hospitals, grocery stores, warehouses and airports; and on vertical urban farms producing locally grown food. We are surrounded by practical applications of robotics technology that improve our lives by making familiar tasks easier, better, cheaper and safer.



Speaking Of Pittsburgh...

Don't just take it from us, **take it from them...**

Lance VandenBrook, CEO of IAM Robotics: *"There's an energy and level of opportunity in Pittsburgh robotics companies similar to what I experienced in my time at Kiva Systems. It's great to be a part of this leading community."*

Mohammad Nadji, Founder and CEO of Neuraville: *"We recently chose to move our company from Wichita to Pittsburgh to access the breadth and depth of talent, to take advantage of an established industry cluster organization and networks, and to be part of the growth and excitement in Pittsburgh. It's the right place to start and grow a robotics company."*

Jim Rock, CEO of Seegrid: *"As a robotics and artificial intelligence industry leader, we are evidence that Pittsburgh is a great place to build and grow a technology company. There is an incredible pipeline of talent, an expansive and supportive community for entrepreneurs, and an authentic focus and determination by our workforce to solve hard problems and provide real solutions."*

William "Red" Whittaker, Founders University Research Professor at Carnegie Mellon University: *"We have always strived to build real things, using engineering to advance science, so that our solutions have the opportunity to lift up the world and its communities. That's our culture."*

Drew Bagnell, Cofounder and Chief Scientist, Aurora: *"Pittsburgh has been a part of Aurora's story from the opening of our very first office in the heart of the Strip. From glass and steel to the Salk vaccine to globally recognized universities and today's cutting-edge robotics, Pittsburgh has been a hub of innovation for a very long time. The city's unique combination of the best and brightest talent, work ethic, and quality of life enabled us to build an incredible team to deliver on our mission to deploy self-driving technology safely, quickly, and broadly. I couldn't be more proud that Aurora calls Pittsburgh home."*

Michael Butler, Chairman and CEO of Cascadia Capital: *"Pittsburgh reminds us of Seattle in the early days of Microsoft. It has all the markings of a major tech hub and its time has come. We're making a big, long-term bet on Pittsburgh, which is poised for growth and success."*

Jeff Burnstein, President of Association for Advancing Automation: *"Many people consider Pittsburgh one of the top two regions in the world for robotics, AI and autonomy, and I have to agree given the rapid pace of innovation taking place there, the impressive number of start-ups, and the infrastructure of talent and support that exists to accelerate the region's growth."*

Martial Hebert, Dean of Carnegie Mellon University's School of Computer Science: *"From steel to healthcare innovation, Pittsburgh has played a major role in building America. Our industrial and engineering roots have led to the birth of advanced robotics and artificial intelligence. CMU and this region's businesses continue the tradition by leading a fourth Industrial Revolution, with a culture, pride and work ethic that makes it possible."*

Mark Thomas, President of the Pittsburgh Regional Alliance: *"There's been a long-term investment to solidify Pittsburgh at its rightful place as one of the world's most innovative, disruptive tech hubs. Robotics is at the forefront of this effort. Pittsburgh is special and a shining beacon of hope for the global economic development and investment community."*

Let's Start A Conversation

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Prepared by TEconomy Partners, LLC
for the Pittsburgh Robotics Network.

Thank you to the Regional Industrial Development Corporation (RIDC), the Greater Pittsburgh Chamber of Commerce, the Pittsburgh Regional Alliance (PRA), Visit Pittsburgh, GO Laurel Highlands, Innovation Works, Carnegie Mellon University (CMU), and Joe Zeff Design for their support.



Pittsburgh is professionally organized to welcome you, inform you, connect you. **Please get in touch.**

