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How can Areas of Innovation play a pivotal role towards sustainable cities and communities?

Plenary session 1:

Cities, STPs and other areas of innovation: challenges and strategies

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35th IASP WORLD CONFERENCE

Towards sustainable cities and communities: Fostering innovation ecosystems

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Introduction

As underlined in the introduction paper to the 35th IASP World Conference, cities play a key role to improve resilience and sustainability as they are the testing ground for transformational new concepts. Cities have to cope with their urban challenges (such as density, transportation, and housing) while maintaining at the same time the most desirable living conditions and managing the multiple demands and interactions of all types of actors on their territory.

The urban location of most STPs/AOIs is a key element of their identity. They have developed links and collaborations with their cities, sometimes for a long time, and they support their innovation policy to foster growth and employment. In a context of sustainable transition, how can STPs/AOIs play a pivotal role in the emergence of sustainable transitional projects and in the coordination of the different players of their community?

Through case studies from two historical areas of innovation, namely Atlanpole in Nantes (France), and Ann Arbor SPARK in Michigan (USA), we will explore two different ecosystems on both sides of the Atlantic, and discover how they have re-invented their future towards sustainable development.

1. Greater Nantes (France) economic area, a fertile land of innovation

As the capital city of Western France, the sixth largest city of France (900,000 inhabitants) and awarded European Green Capital in 2013, Nantes is an attractive, eco-friendly and comfortably-sized city, rated among the best cities in Europe for its quality of life. The surrounding region is a centre of excellence for a large number of key industries. With 2,200 researchers and 54,000 students from all over the world, Nantes is home to a wide and renowned network of higher education schools and institutes. Within only 1 hour flying distance to Paris, London, Brussels, Amsterdam, Milano or Madrid, Nantes is an ideal gate to French and European Innovation Ecosystems. With a 22% increase of population over the last 25 years and 100,000 new residents expected by 2030, the major challenge of Nantes is to keep this high standard in times of demographic expansion. Creativity in urban planning and sustainable development have been the key drivers during the past years. Nantes Metropole has invested a lot in research and innovation.

Technopole and EU/BIC (Business and Innovation Centre) for the Greater Nantes economic and University area, Atlanpole plays a key role as the multisectoral Innovation Hub within the main area of innovation in Western France which connects 7 major innovative World clusters. Atlanpole is accredited by the French Ministry of Research as the science based business incubator for the whole Pays de la Loire Region. As the reference point of contact for thematic French Tech networks, it fosters the emergence, creation and development of innovative companies, start-up companies and of small and medium sized enterprises. Atlanpole is a member of the French National Innovation Network (Retis), the European Business and Innovation Centre Network (EBN) and the International Association of Technopoles, Science Parks, incubators and Areas of innovation (IASP), and is awarded ISO 9001 certification.

Atlanpole Area of innovation at a glance:

- **Atlanpole Entreprises,** a network of more than 460 innovative “atlanpolitan” companies (28,000 jobs), has kept growing for almost 30 years; it tightens links between innovation entrepreneurs and addresses their teams’ day-to-day concerns.
- 71 Research and Higher Education entities within or connected to the Nantes University.
- Several World class clusters of excellence:
    - **Atlanpole Biotherapies,** the Western France Bio Cluster, addresses tomorrow’s medicine, with a specific focus on the development of new biotherapies.
    - **EMC2**, the Western France Cluster dedicated to Advanced Manufacturing Technologies, with its Jules Verne Manufacturing Valley, industrial research institute.
    - **Images & Réseaux**, the Western France Digital Cluster.
    - **ID4CAR** Engine for innovation in vehicles and sustainable mobility.
    - **Mer Bretagne Atlantique**, one of the two French marine technologies Clusters.
    - **S2E2** (Smart Electricity Cluster) managing electric and thermal energies.

- **Valorial** The Agrofood Industry Western France Cluster addressing new challenges for foodstuff of tomorrow.

2. Case study 1: Tomorrow's hospital and medicine in the future Healthcare District on the Ile de Nantes

2.1. The Ile de Nantes and MySMARTLife project, a key urban project and a large-scale transition programme towards a new concept of Smart Life and Economy.

Planned out over 20 years, the urban project of the Ile de Nantes (Island of Nantes) is based on a strong political determination to restructure the city while fostering an economic and social climate that meets today's needs. With its diverse, widely available spaces featuring an exceptional environment, the project offers a unique opportunity to control urban sprawl and build the city of tomorrow. The project will accommodate all uses — housing, business, higher education, major infrastructure, cultural venues and recreational spaces — and all populations, with a focus on sustainable development and innovation. The objective is to create a clear, operational centrality of the Nantes metropolitan area.

The Ile de Nantes is one of the eleven districts of Nantes and the demonstration area which concentrates most of the planned activities of MySMARTLife: 4.9 km long and 1 km wide, located in

the centre of the city of Nantes, the two branches of the Loire River define the island's boundaries. The demo area is divided into three zones with different objectives where the 47 MySMARTLife actions are carried out:

- Zone 1 (new buildings area in the Île de Nantes) is an area where the construction of new buildings takes place, including the connection to the high-performance district heating. Project actions will include a carbon neutral multimodal concept including renewable energy sources production and storage, smart energy systems and "soft" mobility services, the integration of innovative digital boilers in two new buildings, and the development of a smart public lightning concept. Furthermore, a new multimodal concept will be implemented, including renewable energy sources, smart energy systems and "soft" mobility services such as smart power management, smart charging and rental services.
- The focus of the activities in Zone 2 is set on retrofitting. A multi-owner residential building will be retrofitted, including facades, roof insulation, connection to district heating and integration of renewable energy sources managed through a power management system. At the same time, an innovative concept of energy retrofitting in individual houses is taking place comprising insulation of attics and walls, the installation of smart thermostats and a hybrid solar thermal and photovoltaic system.
- At last, Zone 3 (district-city level) covers the entire city, with a focus on mobility and infrastructure actions. 20 new e-buses, nearly 80 charging stations, optimisation of the district heating operation, smart metering and public lighting will be realised, together with a new Urban Data Platform. Citizen solar projects and multi owner building retrofitting projects will be facilitated through two web-based platforms.

MySMARTLife is a project funded under the European Union's Horizon 2020 research and innovation programme. Under the coordination of CARTIF Technology Centre, 28 partners from 7 countries are collaborating to make sustainable cities with smart people and a smart economy a reality. Activities will take place in the three demonstration cities: Nantes, Hamburg and Helsinki. The four other cities Bydgoszcz, Varna, Rijeka and Palencia will learn from these experiences. MySMARTLife project aims at making the three lighthouse cities more environmentally friendly by reducing the CO2 emissions of cities and increasing the use of renewable energy sources. Other activities are focusing on "Inclusive cities", offering a high quality of life in the cities. "Smart people" play a vital role in their city's development. "Smart economy" is an innovative and dynamic economic concept that aims at guaranteeing employment and an adequate income, attracting talent and providing goods and services according to the actual requirements. All these actions in different fields (e.g. mobility, sustainable energy) are being linked through an integrated planning process that involves citizens actively. Following a structured city business model, this will lead to a comprehensive urban transformation strategy, which could be easily transferred to other cities.

2.2. The Healthcare District on the Ile de Nantes and the future Nantes University Hospital by 2020 - 2026

Picture: Pargade Architectes

Nantes University Hospital needs to upgrade some of its equipment and to increase its efficiency by adding more functional facilities that are more attractive for its patients. This means to consolidate the essential University Hospital functions as the centre of the city, to improve the quality of service and also to develop a centre of excellence for training, research and business activities. The University Hospital two main entities, *Hotel Dieu* (currently located downtown) and *Nord-Laënnec* (currently located in the western suburb of Nantes) will merge into one location on the Ile de Nantes.

The objectives of the future Nantes University Hospital include:

- an eco-friendly design, fully integrated in its environment;
- improved working conditions, with more functional spaces, automated transportation solutions and a significant reduction of professionals' urban movements;
- digital technologies for new support and care services, in order to improve professionals information and follow-up and patients confort;
- a design that integrates the requirements of tomorrow's medicine (personalized medicine, automation…).

As part of the future Healthcare District anchored by the University Hospital on the Ile de Nantes, 2 new close by research and innovation centres have recently been constructed, as pioneering projects:

- Health Research Institute *IRS2 Campus* is a University biotechnology research lab that provides new biomedical research space (10,000 sq.m) in anticipation of the future university hospital to be built nearby;
- Nantes Biotech business incubator and research lab is a 6,000 sq. m building facility housing two activities:

- A biotechnology business incubator taking up approximately 4,000 sq. m;
- Another biotechnology research lab for the University of Nantes taking up approximately 3,500 sq. m.

The total budget for the construction of the future Hospital is about €1 billion.

2.3.A healthcare community at the forefront of the medicine of tomorrow

2.3.1. Precision Medicine by data analysis and modelling

Seizing the opportunity of the transformation of its facilities, Nantes University Hospital is therefore accelerating the development of a new medicine, more personalized, based on a wider use of biological and biomedical smart data, that will be reducing the impact of the treatments in terms of resources, of time, of transportation of patients, and of course in terms of side effects for the patients. This precision medicine is already at work in the centre for immunology and transplantation research, funded by Nantes University Hospital, Nantes University and INSERM and where Pr. Pierre-Antoine Gourraud has worked since 2015, after living in San Francisco, California, since 2009. A recognized specialist in the fields of immunology, genetics and bioinformatics, Pr. Pierre-Antoine Gourraud, graduate of the French *Ecole Normale Supérieure*, holds a PhD in biology, and stands at the crossroads of immunology and genetics through his creation of a massive data processing approach by bioinformatics. From his research in immunology and genetics focused on multiple sclerosis, he refined and developed a unique approach to personalized medicine for complex diseases. *"Analyzing the data and modelling them in order to better understand the diversity and complexity of life, are fundamental issues in tomorrow's biology and medicine "* explains Pr. Pierre-Antoine Gourraud. *"We are working so that each patient can receive all the information collected on others before him, in order to better understand the disease and choose the right treatment strategy at the right time."* In clinical discovery, researchers and clinicians are taking vast amounts of patient data, often collected through first-ever clinical studies, and putting it into tools that have a direct impact on patient care. *"The new revolution of 'big data' in medicine,"* says Gourraud, *"will use information technology to transform how we handle and decipher the complexities of diseases like multiple sclerosis (MS)"*. Tools like Bioscreen enable clinicians to compare a particular patient to others with the same disease based on similarities in their clinical symptoms, brain imaging, and biomarker data. By viewing the outcomes of similar cases, each patient has a better idea of how he or she will eventually fare – and what can be done now to bring about the best possible outcomes later.

2.3.2. Focus on the SyMeTRIC project

Aiming at addressing this exciting new challenge, Atlanpole's Area of Innovation has been quite proactive since 2014 in stimulating a better interaction between Images & Réseaux and Atlanpole Biotherapies clusters. As a result, the roadmaps of both clusters have been set up in close collaboration in order to foster implementation of new innovative projects at the crossroad of Biology and Digital Fields, involving academic and entrepreneurial skills. SyMeTRIC is a good example of such a virtuous cooperation as a regional project grouping professionals involved in systemic medicine. It focuses on the use of digital technologies in order to integrate different sources of biomedical information, with the aim of building and validating models and pathology markers for anticipating and improving patient support and monitoring (diagnosis, prediction of therapeutic response, prognosis). Supported by the Pays de la Loire Region and led by Pr Richard Redon (Research Director at the Thorax Institute) and Pr. Jérémie Bourdon (Nantes Computer Science Laboratory -LINA), SyMeTRIC involves research and care teams of the West Cancer Institute (ICO), Nantes University, Angers University, Nantes University Hospital and Angers University Hospital. In the short term, it aims to demonstrate the complementary nature of the work undertaken by different regional professionals (researchers in biology and computer science, clinicians, industrialists) to provide effective and collaborative solutions of omics data analysis on a large scale, as well as biomedical data integration and sharing results. In the longer term, SyMeTRIC aims at the structuring of regional skills and capacities in the service of systemic medicine development on different disease patterns e.g. oncology, transplant, cardiovascular and chronic respiratory diseases. Beyond health, this project will enable the development of close collaborations in data sciences and mathematics: biological processes modelling, learning and data mining, artificial intelligence (knowledge representation, reasoning), distributed systems and cloud computing (usage, security, energy efficiency, scaling).

2.3.3. The role of Atlanpole as catalysis of the transition

To summarize, Atlanpole is deeply involved in the ongoing design of the new Healthcare District and in the transition process to a precision medicine:

- Its CEO Jean-François Balducchi serves on the Board of Atlanpole Biotherapies as Executive Vice-President and on the Board of Images & Réseaux digital cluster as well;
- Deep involvement in the development of MySmartLife Nantes project;
- Innovation scouting in the field of Digital for Health, shared by both clusters;
- Launch and supervision of collaborative research projects and interclustering projects at the crossways between Digital and Life sciences sectors, such as SyMeTRIC;
- Management of EU interclustering projects (Boost4Health and AtlanticKETMed e.g.) to set up a network of partners and develop knowledge databases;
- Individualized business development support for start-ups and SMEs.

Atlanpole supports the innovation dynamic and strengthens the community of actors in the healthcare sector around the Nantes metropolitan area. It also fosters the development of cross fertilisation between digital and health to prepare the revolution in the medicine of tomorrow.

3. Case study 2: Preparing for tomorrow's industrial jobs

3.1. "Technocampus Composites": a large scale research and technological transfer platform for a new concept of manufacturing

Composite materials have gained popularity in high-performance products that need to be lightweight, yet strong enough to take harsh loading conditions. As an example carbon composite is today a key material in the aircraft Space industry. Weight reduction is a major factor which can improve energy efficiency and produce more eco-friendly vehicles that emit less CO2. Composite materials are also widely used in solar panel substrates antenna reflectors. Demand for composite materials continues to rise because composites can be more economical, durable, and lighter weight than traditional materials. They align well with the global trends of sustainability, energy efficiency and water preservation.

The "Technocampus Composites" platform was inaugurated in 2009, after three years of construction and a budget of approximately €80 million. It stems from a collaboration between Airbus Group, CETIM and academic research centres and is a unique concentration in Europe of technical and intellectual resources in terms of research, with the participation of several Engineering « Grandes Écoles » and Universities. The research and technology platform and its resources are accessible to various actors and programs. It focuses on high performance composite materials for large-scale parts. The location, in the southwest suburb of Nantes, hosts 300 individuals, a centre of expertise on composites, industrial facilities which provide manufacturing skills and means as well as an area dedicated to training. The infrastructure allows for full-scale testing of parts, for production of functioning prototypes. Both Airbus Group and CETIM provide researchers and dedicated equipment. This platform for innovation and technology transfer meets the needs of the industrial sector, including large firms and SMEs, all members of EMC2 Advanced Manufacturing Cluster, and is tailor made for R&D pre-industrialisation projects.

3.2. "Jules Verne Manufacturing Valley" Research & technology Institute fosters a cross-fertilization of ideas among the manufacturers' community

Since 2012, Jules Verne Manufacturing Valley Research & Technology Institute has been a mutualized industrial research institute dedicated to Advanced Manufacturing Technologies. Based in Nantes, it

embraces the industrial, scientific and technological challenges that concern four strategic industries: aeronautics, shipbuilding, automotive, and energy. It aims at becoming a world reference in the field of advanced production for composite and metallic materials and hybrid structures by providing solutions to the technological challenges facing industrial segments, e.g. the design and implementation of advanced breakthrough technologies for manufacturing and production engineering.

In order to foster a cross-fertilization of ideas, IRT Jules Verne, in line with EMC2 cluster strategy and with the support of Atlanpole, develops a shared forward-looking vision, implements shared strategic roadmaps, pools resources, and brings cross-disciplinary partners together (academics, start-ups and small and medium-sized companies). It leads activities driven by industry needs on the mid and long-term market trends. With the resources of the Technocampus Composites, it brings together manufacturers, start-ups and SMEs, training facilities, private and public applied research laboratories, and prototyping and industrial demonstration resources. It focuses on strengthening the "industry-research-training" process in order to make the technological jumps that will help companies boost their competitiveness and continuity.

3.3.The role of Atlanpole as catalysis of the manufacturing transition

Atlanpole is deeply involved in the ongoing transition process to new manufacturing:

- Individual business development support for start-ups and SMEs in this field,
- Start-up acceleration program dedicated to IoT and manufacturing technologies, in partnership with EMC2 Cluster: the Manufacturing Factory;
- Jules Verne Manufacturing Valley Institute referent for spin off incubation and acceleration processes;
- In strong partnership with EMC2 Cluster and various other clusters such as Images & Réseaux, launch and supervision of cross sectoral collaborative Innovation and R&D projects, of interclustering projects as well, in order to set up a network of partners and to develop knowledge databases;
- Its CEO Jean-François Balducchi serves on Board of Images & Réseaux Digital Cluster

4. Ann Arbor, Michigan (USA) – Fertile Ground

Prior to 2005, the Ann Arbor region (population 330,000) could best be characterized as one of unmet potential. This unmet potential was both in terms of economic and societal impact. The region was rich in assets that should have made it a hotbed of innovation and innovative companies. Year after year, the University of Michigan deployed the largest research budget of any public university in the US at annual expenditures approaching $1.5B US, yet it lagged in technology

transfer in licensing and company formation. The university had a renowned international reputation and attracted students, faculty and researchers from all over the world. The region was also blessed with a large number of high-net worth individuals and families from Southeast Michigan's legacy as the United States' first "Silicon Valley"; that of the incredible history as the innovative entrepreneurial heart and birthplace of the US automobile industry and the Arsenal of Democracy during World War II. Ann Arbor itself was and is one of the most attractive communities to live in, not only in Michigan, but in the US, with a highly educated population, high quality of life, and a relatively low cost of living and of doing business.

These potential assets, though, were underperforming. Entrepreneurship and the creation of new companies, plus the commercialization of an incredible number of new ideas, products, and processes coming out of the University of Michigan, was lagging when compared to other areas of the US. Much like a "potential" viticulture area with good soil, climate and geography that lies dormant and overgrown with weeds, Ann Arbor needed several "vintners" to capitalize on its terroir by recognizing its potential and to intentionally intervene by introducing appropriate varietals with modern growing techniques and well capitalized support systems to bring the product to market and to maximize its potential.

Ann Arbor lacked an effective private-public-academic platform outside the university to create a nurturing environment to receive potential companies that could be spawned once the Technology Transfer Office improved its processes to commercialize new technologies and create start-ups and early stage companies. It was felt that if such a collaborative platform could be created then an entrepreneurial ecosystem would evolve to bring talent, ideas and capital together and dramatically change the surrounding region into a known locale for entrepreneurship, early stage company creation and innovation…an Area of Innovation (AOI). SPARK came into being in 2006 and has been integral in creating an Area of Innovation with great results over the first twelve years of its existence.

4.1.Ann Arbor SPARK's Mission

The SPARK board of directors consists of leaders representing all three elements of the triple helix – the private sector, government, and local academic institutions that have an adopted strategic plan consisting of three strategic initiatives of acceleration, talent and growth on the foundation of two supporting initiatives of leadership and planning. These initiatives are delivered through the individual actions of different elements of the triple helix that are coordinated and advanced through the collaborative efforts of the SPARK professional staff teams in the areas of Business Development, Business Acceleration, and Marketing and Communications as directed by the SPARK board of directors working through its Executive Committee and the Finance, Business Development, Entrepreneurial Services, Foreign Direct Investment, and Public Sector Committees.

SPARK's mission is to "*advance the economy of the Ann Arbor Region by establishing the area as a desired place for business expansion and location...by identifying and meeting the needs of business*

at every stage, from those that are established to those working to successfully commercialize innovations."

Core to this mission are founding values:

- To provide high value and innovative services to our stakeholders and customers helping meet their challenges in an increasingly dynamic and volatile global economy.
- To pursue the principles of open source economic development by engaging in regional and statewide collaboration with public, private and non-profit partners to advance the Ann Arbor region, Southeast Michigan, the State of Michigan and the nation.

4.2.Ann Arbor's Area of Innovation

The key to understanding the difference between an Area of Innovation and a stand-alone Science and Technology Park is that an Area of Innovation expresses itself through the ordinary fabric of the city or community within which it sits. In the case of Ann Arbor's geography this has transformed a multi-block area of the core downtown into a high technology corridor in and around the existing city fabric near the main University of Michigan campus and has created a demand for technology companies to squeeze into any available space they can find.

SPARK anchors the downtown district with an early stage acceleration facility and its operational headquarters near multiple growing technology companies. An array of programmatic, consultative, and financial services are provided to the companies within the area of innovation from these locations financed through a FY 2017 budget of $8.2M from resources provided to SPARK by the triple helix stakeholders. A key source of funding is the area of innovation itself that, through a

creative mechanism provided under the State of Michigan's legal statute, allows a portion of the increased taxable value in the AOI to be captured and returned ultimately to SPARK (through a cash transfer from the State of Michigan). The money is used by Spark to provide direct services to early stage companies that in turn locate within the buildings of the district creating additional growth in taxable value: a true virtuous cycle.

The University of Michigan is a driving influence through its support of SPARK financially and through the fact that the President and key deputies play central roles in almost every key SPARK committee and initiative. This influence is felt further by the Office of Technology Transfer being directly integrated into the Ann Arbor terroir and graduating its commercializing technologies out into the private real estate market supporting that virtuous cycle. It provides further influence by the actions of its Business Engagement Center that receives the innovation needs of Fortune 500 partners through sponsored research and contracts that lead to new technologies and companies that also graduate into the terroir.

5. Case Study 3: Ann Arbor as Living Laboratory

5.1.A2Tech360: The evolution of Ann Arbor's "Tech Trek"

Downtown Ann Arbor is a tech hub. In 2015, Ann Arbor SPARK launched Tech Trek to connect the community with the burgeoning tech scene in their hometown, allow companies to showcase their innovations, and enable job seekers to explore potential employers. Tech Trek is a free community event and essentially an open house for community members to visit the offices of downtown tech companies. The event has nearly tripled in scope since its inception, with attendance increasing nearly 75% year over year, with over 2,000 attendees in 2017.

Building on the success of previous years, SPARK added a new element in 2017, Tech Talk, a TED-style event featuring some of Ann Arbor's most interesting and impactful companies. Speakers shared key insights on evolving innovations, research, and technology, and took questions from the audience. The addition of Tech Talk was such a massive success that it spurred the evolution of a multi-day tech "festival" planned for June 2018, branded as "A2Tech360". A much smaller version of Austin, Texas's South-by-Southwest, A2Tech360 2018 will be a 3-day affair, including events such as: Meeting of the Minds Mobility Summit (an externally organized event capitalizing on the proliferation of mobility technology in the region), the FastTrack Awards (honoring fast growing companies in the region), Tech Talk, an open-air free concert between Tech Talk and Tech Trek, and the flagship event on Friday afternoon: Tech Trek.

The evolution of Tech Trek into A2Tech360 is a testament to the vibrancy of Ann Arbor's downtown Area of Innovation, the critical mass of companies and activities, and the initiative of Ann Arbor SPARK to connect the wider community to the technology community.

5.2.An "Operating System" for citywide mobility technology implementation

In part due to the success of Tech Trek and its evolution into a multi-day event, as well as the recognition of downtown Ann Arbor as an Area of Innovation and tech hub, Ann Arbor SPARK is working to implement a prototype of a living laboratory for mobility technology in downtown Ann Arbor. SPARK will work closely with eight stakeholders including Amazon Web Services, Deloitte Consulting, Ford Smart Mobility, the City of Ann Arbor, and the University of Michigan. This type of city level "operating system" will enable "plug and play" hardware such as vehicles and street-level infrastructure as well as data management, payment, and other software systems to allow for maximum efficiency. The project as of publication of this paper is still in planning stages but will work to use design thinking to offer mobility-as-a-service to residents, visitors, and workers in downtown Ann Arbor. In this way, Ann Arbor will play to existing strengths as an Area of Innovation, support cluster development in a burgeoning industry, and cement its global position as a leader in mobility technology.

The benefit to government-level stakeholders of this project will be analysis and insights on operations, service, and future investments, with a low-touch engagement (expertise and data). Additional funding not provided by the partners will come from the Local Development Finance Authority, the same body that funds Ann Arbor SPARK's entrepreneurial activities. Research and development activities will be coordinated and organized by the University of Michigan's Transportation Research Institute. Ford Smart Mobility and Deloitte Consulting will jointly coordinate stakeholder engagement and refine the blueprint roadmap for mobility transformation in Ann Arbor.

The project will be conducted first with a 90-day MVP (minimum-viable-product) exercise, which will:

- Discover the existing data, understand how it is organized, and aggregate the data within a platform in a meaningful way.
- Produce three deliverables: preliminary Mobility Insights, a 3-5 year Blueprint Roadmap, and a preliminary funding model..
- Provide input for the stakeholders to make a go-no go decision for undertaking Release 1.0.

For Release 1.0, the effort will be working across the collaboration to provide meaningful use of the data and platform to support the goals of government and university stakeholders through activities like:

- Data analysis, visualizations and recommendations that address core issues such as parking demand, traffic congestion, and transit opportunities within the Ann Arbor area;
- Mobility pilots consistent with institutional goals for testing transformational approaches to serve Ann Arbor area residents, visitors, employees, employers, etc;
- Research activity focused on advancing thought leadership being generated at the University of Michigan.

The living laboratory would not be possible without the existence of Ann Arbor SPARK, and the intentional creation of a quadruple helix structure that cultivates relationships between government, the private sector, the University of Michigan, and the neighboring city of Detroit. This demonstrates

that beyond the physical assets of Ann Arbor, the community of actors is crucial to building and maintaining a living and breathing Area of Innovation.

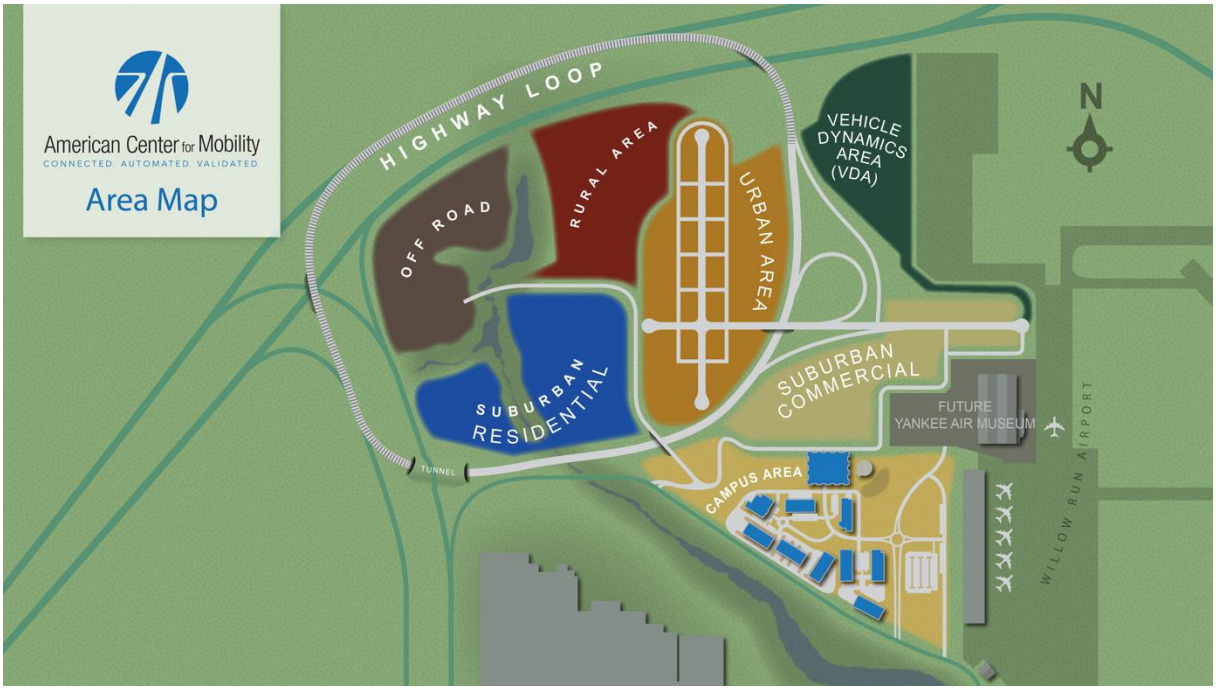
6. Case Study 4: the American Center for Mobility

The story of the American Center for Mobility (ACM) begins with Willow Run and is pivotal in American history. Willow Run history is about a place and people that helped win a world war, set the stage for equality and social change, and dramatically accelerated the development of Southeast Michigan.

In 1941, both the US government and established aircraft manufacturers believed it impossible to build aircraft on an assembly line, and initially hoped The Ford Motor Company would help the war effort by handcrafting one airplane per day. Ford's chief manufacturing engineer, Charles Sorensen, believed assembly line production of airplanes was possible, and sketched a plan overnight in his California hotel room. That plan became Willow Run, which included a major airport, a 5 million sq. ft. manufacturing plant and a village for the workers, all rising from scratch on former farm fields in less than a year. Aircraft production began in 1941, and at its peak during the war years, over 40,000 workers at Willow Run produced B-24 Liberator bombers at the astounding rate of one airplane every hour. After the war, Ford sold the plant to the Kaiser-Frazer Corporation that used it to produce automobiles. During the Korean war, Kaiser-Frazer produced C-119 and C-123 planes, before ceasing operations in 1953 and selling to General Motors. For several decades Willow Run stayed GMs transmission plant. In 1982, the 50 millionth transmission rolled down the assembly line. In 2010 the production stopped.

The site includes over $100 million in usable infrastructure ideal for simulating real traffic scenarios, vehicle testing, vacant roads, cross lighting, an abandoned railway, and other unique structures including two triple overpass sections and a bridge over a natural waterway. The property is 332.53 acres located in the middle of the Metro Detroit area, an essential gateway between Canada, Chicago and the rest of the Midwest. Immediately adjacent to the site is the Willow Run Airport, and Detroit Metropolitan Airport is just 15 miles away. The Port of Detroit is 34 miles from the site, and area Interstates are highly accessible.

The American Center for Mobility facilities will be unparalleled with infrastructure that mimics a wide range of environments that automated and connected vehicles will encounter. Unique to ACM is that it will have areas that serve today's needs (urban, sub-urban and high-speed environment) but also areas that serve future needs (rural, off road), all in one place. Some important and otherwise expensive constructions are already existing (e.g. double overpasses) or can be realized relatively easily (e.g. tunnel and urban area). On top of this, Michigan's wide range of weather conditions allow testing of all these environments in varied weather conditions, representative for the entire American continent.



Ann Arbor SPARK has been involved in the American Center for Mobility from the very beginning and continues to play leadership, management, and operational roles in the development and administration of the facility.

In 2013, SPARK released a white paper titled "Ahead by a Century: *The Future of Automotive Technology"* outlining how the Willow Run site could be utilized as a connected and automated vehicle testing center. SPARK staff then began a series of meetings with key officials at the federal, state, and local levels, briefing them on the importance of the project to the region and to the state. Multiple surveys and research reports were undertaken by partner organizations to outline the feasibility of the project.

In 2015, work began to organize a non-profit entity that would operate the American Center for Mobility, as well as begin the due diligence process for development of the site. A working group was designated to continue work on the study, including the Center for Automotive Research, the Detroit Regional Chamber, Business Leaders for Michigan (BLM), the Michigan Economic Development Corporation (MEDC), the Michigan Department of Transportation (MDOT), Walbridge (a construction and engineering firm), and the University of Michigan. Ann Arbor SPARK and Walbridge were awarded a grant from the federal U.S. Economic Development Administration to conduct a feasibility study for the former manufacturing site to serve as a national center for connected and automated vehicle research, testing, product development, validation and certification facility.

2016 saw the official launch of ACM, the formation of the board, further investment for the final acquisition of the site, and the ground-breaking ceremony for the start of construction. In the winter of 2016, the American Center for Mobility reached an agreement with AT&T as an exclusive cellular network provider until 2020, teaming up with the Center, car companies and tech start-ups to test automated and connected vehicles. AT&T will also provide network service to allow the cars to talk to infrastructure, pedestrians and also to other cars. ACM competed with dozens of sites around the U.S. to receive federal designation, which was finally announced in January of 2017: *"American*

Center for Mobility designated by US Department of Transportation as national automated vehicle proving ground". The solicitation of proposals for the designation of the Automated Vehicle Proving Grounds Pilot program was announced in late November by the US Department of Transportation and only 10 facilities were selected out of the more than 60 organizations who applied to receive the designation.

In 2017, total funding from the Michigan Strategic Fund to the project reached $32 million — illustrating the level of commitment from the State of Michigan to bring the facility to the next stage of development. In addition, construction on Phase 1 of the project – the high-speed loop – began and was complete by the end of the year. Throughout Q3 and Q4 of 2017, Toyota, Ford, Hyundai, and Visteon all announced their intent to support as Founder-level sponsors with a $5 million contribution each. Also in 2017, ACM and SPARK released a Request for Partnership to develop a technology park attached to the facility. The selected development partner will conceptualize and develop a world class tech park adjacent to the connected and automated vehicle proving grounds. The partner will also manage the construction of the tech park facilities. The 25 acre location for the 45,000 sq. ft. headquarters has already been selected based on its proximity to the ACM proving grounds. In addition to the headquarters, the project includes design and construction of a 13,500 sq. ft. lab that will be adjacent to the headquarters and the proving grounds. In December 2017, construction on Phase 1 of the project was completed, and American Center for Mobility opened its proving grounds for testing, with Visteon Corporation and Toyota Research Institute on site to begin testing operations. The opening builds on years of involvement by Ann Arbor SPARK, Ypsilanti Township, elected officials, the University of Michigan, the State of Michigan, Washtenaw County, and numerous other partners to bring this project to the site.

SPARK is deeply involved in the ongoing work of the American Center for Mobility, helping to manage all aspects of the process, including:

- CEO Paul Krutko serves on the Board and as Treasurer of ACM;
- Providing back of the house support to ACM staff (human resources and finance management);
- Supervising the development of a technology park at ACM;
- Development of funding solicitation proposals;
- Business development (lead generation and relationship management for both users and tenants of the site);
- Managing the entirety of the Request for Partnership process (to find a partner to develop the tech park and headquarters facilities).

SPARK also creates and maintains marketing material for the site, including microsites housed on the SPARK website detailing the mobility research cluster, mobility companies in the region, mobility assets near ACM, recent press, and a tool to search available properties nearby. Ann Arbor SPARK was a key player in identifying the opportunity, the nascent industry cluster, the commercial prospects, and the community building potential of ACM, and acting with intent. SPARK continues to be heavily involved in all aspects of the project, viewed as a community good that necessitates a

community approach. Leadership in this sense does not follow a top-down structure but originates from the “glue” between different partners in the development process. The American Center for Mobility is already a crucial economic driver for the region, defining the direction of an area largely left listless after the global recession. ACM helps to answer the question: how can Southeast Michigan stay relevant in a changing world, capitalize on existing market advantages, and prepare for the future?

Conclusion

On the Atlantic French and Western European coast, the Ile de Nantes, a former brownfield downtown Nantes, is a large-scale demonstration area for smart and sustainable innovative solutions. Atlanpole's Area of Innovation aims at seizing the opportunity of the construction of a brand new University Hospital to enhance and accelerate the implementation of Tomorrow's personalized medicine that will totally remodel the link Patient-Hospital with for example, among many other patient benefits, a drastic frequency reduction of patients mandatory transports, either commuting within the city or travelling from the region. With the "Technocampus Composites" platform and EMC2 cluster, Atlanpole's Area of Innovation prepares tomorrow's manufacturing using advanced processes and sustainable composite materials, lighter in weight than traditional ones, that will significantly and positively impact energy reduction costs for Air, Sea, and Ground transportation.

Across the Atlantic Ocean, specifically within the downtown urban core of Ann Arbor's Area of Innovation, SPARK and a diverse group of government, private sector, and academic stakeholders is creating a living laboratory for community engagement with the downtown technology hub, and more formally for the implementation of mobility-as-a-service in the downtown Area of Innovation. This developing project complements the growing American Center for Mobility testing grounds, creating a synthesis along different stages of development for the budding mobility industry, and a competitive advantage for the region.

Despite the distance and some obvious cultural or economical differences, both Ann Arbor and Nantes ecosystems show striking similarities as it is easy to point out the common ingredients which make it easier for their respective Areas of Innovation to playing a key role in reshaping the economical and urban environment of the city and the metropolis, and to take advantage of new opportunities for the future:

- **Agility for experimentation**: the creation of large-scale platforms acting as "living laboratories" in the city, benefiting from public-private co-financing, and ready to implement innovative solutions with all types of actors;
- **Knowledge and community development**: the creation, animation, and interaction of clusters based on platforms; the development of knowledge and technology transfer, including start-up incubation and acceleration processes.
- **Leadership**: a political determination to create an inspiring atmosphere of intentional innovation, and to attract talents that strengthen competitive advantages.
- **Networking and dissemination**: added value created within the Area of Innovation benefit to many other actors and companies beyond the core of the area, throughout the whole regional ecosystem.

These elements of success point to a global model for Areas of Innovation. Intentional innovation is possible through the deliberate creation of platforms, the purposeful focus on the existing strengths

and nascent industry clusters, the cultivation of relationships through firm leadership, and the foresight that an Area of Innovation will always be part of a global network.