City of
# Dublin
## OHIO, USA

**Innovation Framework**

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## Table of Contents

Innovation in local government is the lifeblood of successful economic & fiscal sustainability, customer-focused service delivery, and an engaged municipal workforce. The City of Dublin has a long history of innovation in service delivery and community development.  We have built a culture that prides itself on creative problem solving, informed risk-taking and visionary opportunity seeking.

The City of Dublin received global recognition by being named a Smart21 and Top7 Intelligent Community by the Intelligent Community Forum four and two times respectively since 2008.  In 2015 Richard Florida named Dublin among America's Top 20 Creative Class Cities in the U.S.; the only non-costal city to receive the honor.

As we continue our efforts to be a global leader in municipal innovation this document will serve as a summary of the City's innovation initiatives, accomplishments to date and a road map for next steps.

## Framework Review & Execution

An internal team led by the Assistant City Manager has been established to monitor, review, update and ensure execution on the various initiatives described in this document.  The team meets on a monthly basis and provides routine updates to the City Manager.

The team consists of the following positions:

- Assistant City Manager
- Chief Information Officer
- Development Director
- Public Works Director
- Communications and Public Information Director

# INTRODUCTION

## Guiding Direction

Foundational to our Innovation Strategy are the City's Vision, Mission and Strategic Focus Areas. These provide direction for what we do and what we plan to do as we create our community's future.

### Vision

A global city of choice.
Vibrant. Innovative. Engage

### Mission

We are and always have been a proud local democracy.
In our service, we strive to provide the best quality of life and environment in which our residents and businesses can thrive.
We seek to ally our proud traditions with the best innovations of the future.

### Strategic Focus Areas

**Fiscal Health**: The City ensures its financial health through the implementation and coordination of sound fiscal policies.

**Economic Vitality**: The City ensures its economic vitality through sound land use planning; forward investing in infrastructure; and continuous focus on innovative economic development programs to compete regionally, nationally, and globally.

**Smart Customer-Focused Government**: The City is a high-performing organization that is accountable and responsive to the needs and desires of the community and continuously improving on its best-in-class services.

**Community Engagement:** The City secures home rule powers and local self-governance for its residents through proactive communication and a focus on public input, volunteerism, diversity, and inclusion.

**Safe and Resilient Community of Choice:** The City provides a secure and stable environment and continuously prepares to respond to, withstand and recover from adverse situations.

# INTRODUCTION

## Defining "Smart City" and "Intelligent Community"

For local governments today much of the buzz around innovation relates to "smart city" initiatives. What that means and how it is carried out varies from community to community. For the City of Dublin, we believe Smart and Intelligent, while distinct in their definitions, go hand-in-hand in a community's success. Here is how we define each:

**Smart City** - Numerous definitions exist to describe what it means to be a smart city. After reviewing several definitions used by other cities that are leading the way with smart city initiatives, the following definition is one that resonates and best aligns with Dublin's vision:

> "A **Smart City** leverages new and emerging technologies, data and people to solve community challenges, improve services and enhance the quality of life for residents."

**Intelligent Community** – ICF uses the following definition to explain the characteristics of an Intelligent Community:

> "**Intelligent Communities** are those which have – whether through crisis or foresight – come to understand the enormous challenges of the Broadband Economy, and have taken conscious steps to create an economy capable of prospering in it".

ICF further offers that a Smart City and an Intelligent Community differ in the following ways:

- Smart City projects, through technology and data, "make cities work better".

- Intelligent Communities "seek to make better cities", taking a broader view of what is needed to be successful beyond the base technology and data.

# INTRODUCTION

## Let's Get Started

The following pages, provide a summary of the City's innovation initiatives. Each includes:

1. A description of the initiative
2. Accomplishments
3. Planned next steps

## What Success Looks Like

We will know these initiatives have been successful when we can demonstrate that we have:

- Continued to build a culture of innovation among our staff and in our community

- Led the way as a best-practice example of a smart, digital, connected city

- Leveraged emerging technologies to improve services

- Helped others to become Intelligent Communities

- Created an innovation ecosystem that results in economic advantages

- Involved a diverse representation of residents as we worked together to improve quality of life

# Culture of Innovation & Continuous Improvement

## PIEWORKS (INTERNAL INNOVATION TEAM)

# PIEworks

PROCESS IMPROVEMENT | INNOVATION | ENGAGEMENT

City of Dublin
OHIO, USA

## Overview

PIEworks began in 2017 as a team composed of employees that were trained and certified as Black Belts in 2016. The team serves as an internal resource for leading process improvement and innovation projects as requested by City employees. They meet monthly to review, discuss and propose process improvement and innovation initiatives.  PIEworkers dedicate a portion of their time to leading PIEworks projects.

In June of 2018, the team transitioned their name to PIEworks to better represent and brand its three areas of focus: *Process improvement, Innovation and Engagement.* They are led by the Assistant City Manager and a Master Black Belt Consultant.

- **Process improvement** is at the core of the team's focus. All PIEworkers are certified Black Belts, using proven process improvement tools, techniques and analysis to enhance service delivery, save resources, reduce completion time and improve customer service.  The team currently consists of 8 certified Black Belts. Additionally there are 10 employees trained as Green Belts and 30 employees trained as Yellow Belts who are also using some of these tools and techniques within their individual work units.

- **Innovation** is vitally important to both process and service delivery improvements. Thinking of creative and new ways to approach our delivery of services or to create new service delivery methods will set us apart from other local governments and bring value to our residents. Innovation is and will continue to be part of the City's culture.  Part of the PIEworks' mission is to continue building upon this culture.

- **Engagement** means that we will have the right people at the table when we discuss service delivery improvements, fully involving them in the discussion, discovery and implementation. The right people could be employees, residents, businesses, contractors, vendors etc.  Engagement for PIEworks will, wherever appropriate, involve the customers, using concepts of human-centered design and prototyping.

## PIEWORKS (INTERNAL INNOVATION TEAM)

## Accomplishments

- Each team member (PIEworker) is responsible for leading or co-leading at least two projects each year.

- In 2018 PIEworks initiated IdeaStarter, which provided employees throughout the organization the opportunity to submit an innovative idea to improve an existing service or propose a new service/program. Forty-one ideas were submitted that were narrowed by the team to the top 16. These 16 finalist presented their ideas live to a panel of judges who selected 10 ideas to be further worked on with assistance from a PIEworker. Those deemed as viable to move forward will be implemented in 2019.

## What's Next

- Continue to review operational processes as identified by the City's various Departments and Divisions.

- Realizing the team needs to build their innovation and facilitation skills, several development courses were reviewed.  During September/October, two employees attended a 2-day facilitation course and one employee took a 5-week on-line design thinking course. These employees evaluated the courses and provided feedback to the larger team.

- Additional team development is now being offered based on feedback from reviewed courses. In mid-December, twenty-one employees took a two-day on-site facilitation course.  Attendees included several PIEworkers along with employees from Planning, Engineering, HR and CPI.  Based on overwhelmingly positive feedback from attendees, a second class is being offered in spring of 2019.

- Work with the IdeaStarter finalists to develop the business plan for their ideas.

- Produce a first year-end annual report of accomplishments.

- A third class of seven Black Belts will join the team once they have completed training and certification, which started in the fall of 2018 and ends with a certification exam in June/July 2019.

# DIGITAL EXPERIENCE LAB

## Overview

The Digital Experience Lab brings together staff from Communications & Public Information (CPI), Information Technology, and representatives of several other divisions, including front line staff, to explore and test new ideas around digital government and digital service delivery. The Lab environment is designed to help the team focus on rapid ideation, research and experimentation. Lab members meet as a team once a month.

How our residents want to digitally experience City information and access to services is changing, influenced by their experiences with other industry sectors that have set the bar high with the use of new and emerging technologies that enhance quality and responsiveness of information and service delivery. The lab will serve as a mechanism to gather, create, develop, evaluate, or mature innovations that improve the experiences of residents, commuters, businesses, visitors, students, and employees with digital delivery models.

## Accomplishments

- The Lab has hosted a variety of tech companies and experts to help develop a stronger understanding of new and emerging digital technologies and to explore their application in the City.

- Development of Alexa skills to allow residents to hear Dublin News in 90 and weekly "flash briefings"

- Augmented reality uses are currently being explored and a company has been engaged to pilot a select set of uses.

## What's Next

- Lab members are exploring an augmented reality/virtual reality/mixed reality (AR/VR/MR) hackathon type competition, envisioning firms being able to submit a Dublin-based example of AR/VR/MR related to a City cultural asset (or group of assets).

- An on-going role is for the lab to serve as a clearinghouse of digital innovation ideas from vendors or other outside organizations. The Lab can evaluate the claims of vendors and determine if their innovations have a place in the City's larger innovation strategy.

- Leverage a tech-based advisory committee of residents and business representatives to further idea generation and implementation of Lab initiatives.

# COMMUNITY ENGAGEMENT



## Overview

The City of Dublin has a long history of community engagement with a community, staff and City Council that embraces involvement in local government.  With active boards & commissions, home owners associations, citizen academy alumni, police academy alumni and more than 3,000 resident & corporate resident volunteers annually supporting city-wide activities, the City is in a unique position to leverage community involvement in service delivery innovation.

Using principles of design thinking, human-centered design, prototyping and data analysis, the City will involve residents and corporate residents in the development of new and/or improved services as appropriate.  This "citizen-centered design" philosophy will include residents early in the design process as they help to provide input and to develop, prototype, implement and review key services.

# COMMUNITY ENGAGEMENT

## Accomplishments

- Alexa for Older Adults – In partnership with Syntero and Ohio University, the City has deployed ten Alexa and related smart home devises to ten older adult residents.  Resident volunteers have been matched with the older adult as an "Alexa Buddy" to teach them how to use the devise and to gain an understanding of other ways the devise could help with the needs of this growing segment of the Dublin population.   This project began in August and feedback has been extremely positive.  Residents in this pilot group are using Alexa to play music, listen to podcast, for medication and appointment reminders, and to contact caregivers.  Further feedback and user surveying needs to be completed.

- LIME Bikes Roll-out – Earlier in 2018 the City worked with a dockless bike share company, LIME, to pilot the dockless concept in Dublin.  Based on review of other communities that had faced challenges with dockless systems, the City's volunteer team of Bicycle Ambassadors were gathered for input ahead of the roll-out and to serve as an additional set or eyes and ears once the bikes were deployed.  In addition to engaging this group of resident ambassadors, usage data and user feedback gathered by LIME is reviewed with the City staff to re-set where the bikes should be stationed throughout the City.

- PIEworks Processes – PIEworks has initiated Kaizen events to review City processes that have involved HOA representatives, contractors, developers and employees from other governmental agencies.  With the initiation of any significant process review, an initial project charter is developed that calls out those that need to be involved from the customer perspective.

## What's Next

- 311 System – The City will soon be moving forward with an improved resident facing service request system.  The development of this user interface will involve resident input, drawing from Citizen U alumni.

- Aging in Place – In partnership with Syntero and Ohio University, a website will soon be developed to serve as an informational hub for older adults and their caregivers to help guide them toward needed services.  Residents are being invited to participate in the development, review and testing of the site, with initial design sessions beginning in late December of 2018.

- Continue to assess opportunities to involve residents in service design and re-design projects and other improvement and problem-solving processes.

# IT COUNCIL

## Overview

- Formed in January 2016, the IT Council is the Governance mechanism overseeing the prioritization of IT projects and initiatives, and providing oversight to the IT function within the City of Dublin.  The Council consists of a group of leaders from throughout the City, who represent the various departments/divisions.  The CIO serves as the Chair of the Council which meets each month to review the current portfolio of IT projects and initiatives. The IT Council has successfully formed and established processes for meeting its core objectives. New Enterprise level systems are reviewed with the Council and their implications are considered as a City.

## Accomplishments

- The Council continues to meet each month to consider projects, initiatives and related budget implications.  The IT Department provides the IT Council with reports and data on progress and items of performance, and the Council provides feedback, and an accountability role for the department and the function of IT in the City.

## What's Next

- The IT Department will soon display and demonstrate new types of data to both staff and residents. The IT Council will serve as an important review step as we select new data sets and visualizations to be shared with the public.

# INNOVATION ECOSYSTEM



## Overview

The City of Dublin's Innovation Ecosystem is based on the triple-helix philosophy in the belief that partnerships between industry, government and academic entities will be the driving force in fostering economic and social development. Dublin's location in Central Ohio, the city's vision for its West Innovation District as a biomedical and technology corridor adjacent to US33 and its commitment to "smart" development for its residential and corporate communities make it uniquely positioned to compete in and accelerate an Innovation Ecosystem.

A Smart City ecosystem is developed over time in the following ways:

- Build new connections – one cannot know the ecosystem they are operating in without getting out and observing how it functions

- Establish channels between possible partners – These channels are about collaboration and not deals, creating value by learning from others

- Partner with others – helping new partners through business accelerators broaden capabilities and create new markets

# INNOVATION ECOSYSTEM

- Foster sustainable action – it takes time, money and resources to create sustained, active relationships with accelerator programs which results in ongoing, complex exchange of ideas, values and initiatives where all players are contributing and have a vested interest in supporting the ecosystem

## Accomplishments

Engagement with existing and potential academic and industry partners has taken place over the course of the last several months to foster and strengthen relationships and discover areas of opportunity in the following industry sectors:

- **Automotive** – An automotive industry partner recently expanded their satellite office in Dublin to accommodate 13 new employees and add 5,300 square feet of research and office space. This company is actively engaged in discussions to deploy their technology through pilot projects in the City beginning in 2019.
- **Health** – Ohio Health was recently awarded an economic development incentive to retain and expand their presence in Dublin making it the second largest employer in the city. One important component of the agreement is the relocation of 200 jobs related to information technology and data management and the potential for research and development of health info-matics in collaboration with academic partners.
- **Energy** – Discussions are underway with private and public entities regarding the feasibility of a smart grid project in the west innovation district. A smart grid is an electrical grid which includes a variety of operational and energy measures including smart meters, smart appliances, renewable energy resources, and energy efficient resources. With the imminent expansion of the city-owned property on Rings Road and the Ohio University campus, reliable and redundant and sustainable sources of energy are essential to support research, development and daily operations.

## What's Next

- Continue working to leverage the West Innovation District, 33 Smart Mobility Corridor and Connected Dublin to attract tech and research-based companies interested in these emerging areas.  The City's commitment to innovation led to the creation of the West Innovation District with the goal of fostering an entire ecosystem focused on the development of new "smart" technologies and business processes related to public health, energy and the environment, as well as already existing efforts in technology and transportation that can be commercialized nationally and around the globe.

# STRATEGIC PLANNING

Innovative visioning of our future state is critical to being a sustainable and resilient organization and community. By developing and executing on strategic visions we are able to position the City for success. The following are a few of the critical strategic plans and studies the City currently has in place and is actively implementing.

**Mobility Study** – The purpose of this study is to provide our increasingly diverse community access to a range of transportation options, which will connect more people to more places.
https://dublinohiousa.gov/special-projects/city-of-dublin-mobility-study/

**Aging in Place Strategic Plan** – This plan provides a strategy for how the City will move forward to address the needs of older adults that wish to remain in their homes and/or remain in Dublin as they age.
http://dublinohiousa.gov/dev/dev/wp-content/uploads/2016/09/Aging-in-Place-Strategic-Plan.pdf

**Dublin Corporate Area Plan (DCAP)** – To remain competitive, the City has been studying the existing conditions, market conditions, stakeholder requirements, and effects of the changing work space demands on older suburban office complexes – known as "legacy" office spaces in older office parks like Metro Place.
https://dublinohiousa.gov/economic-development/dublin-corporate-area-plan/

**West Innovation District Plan –** The West Innovation District Area Plan describes the future growth potential of the far western corridor of the City. The original goal of the plan was to establish a world-class innovation and research district. In 2016, the City decided to revisit the concept given changes in the research industry and the commitment from Ohio University to develop a cutting edge academic and research campus in Dublin.
https://dublinohiousa.gov/dev/dev/wp-content/uploads/2017/08/WID-Special-Area-Plan-Final-Report-2017.pdf

**Sustainability Framework** – This plan explains the City's history of sustainability, recent accomplishments and provides goals to be accomplished within the 2018-2020 timeframe.
https://dublinohiousa.gov/dev/dev/wp-content/uploads/2018/09/CSAC-Recommendation-Sustainability.pdf

**Battelle Study –** In the Fall of 2014, staff identified the need to review the City's economic development programs and efforts in order to conduct an inventory in a format that best articulates the purpose of the programs, status of their implementation, and assessment of their benefit to the overall economic development effort.  The question this study sought to answer was "As the City of Dublin's economic development strategies, programs, and efforts have evolved over time, have the tools, policies, and programs advanced to meet the pressing needs of today's global markets?
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# Broadband & Digitization

# INTELLIGENT COMMUNITY FORUM

## Intelligent Community Forum (ICF) Methodology

Important to the City's Innovation Strategy are the insights and guidance provided through the Intelligent Community Forum's methodology. The City of Dublin has been named a Smart21 and a Top7 Community of the Year several times and closely adheres to the ICF's methodology. The ICF is a global network of cities and regions with a think tank at its center. Its mission is to help communities use information and communications technology (ICT) to create inclusive prosperity, tackle social and governance challenges and enrich their quality of life. **The ICF's *Six Key Indicators*** serve as the standards against which communities measure their progress. These Key Indicators are as follows:

- **Broadband** – Broadband is the new essential utility, as vital to economic growth as clean water and good roads. Intelligent Communities express a strong vision of their broadband future, encourage deployment and adoption, and deploy their own networks where necessary.

- **Knowledge Workforce** – A knowledge workforce is a labor force that creates economic value through its knowledge, skills and ability to use information effectively. Success in the broadband economy requires the ability to create a workforce qualified to perform knowledge work from the factory floor to the research lab, and from the construction site to the call center or corporate headquarters.

- **Innovation** – Intelligent Communities pursue innovation through a relationship among business, government and academic institutions. This innovation triangle helps keep the economic benefits of innovation local and creates a culture that engages the entire community in positive change. Investments in innovative technology by government also improve service to citizens while reducing operating costs and providing valuable support to a dynamic innovation ecosystem.

- **Digital Equality** – Intelligent Communities promote digital equality by creating policies and funding programs that provide everyone with access to digital technology and broadband, offer digital skills training and motivate people to acquire those skills.

- **Sustainability** – Communities that use fewer resources to create products and provide services are more efficient and productive, which is key to continued improvements in the standard of living. Many, if not most, sustainable measures improve local quality of life from cleaner air and water to improved public transportation and greater "livability".

- **Advocacy** – Advocacy is the slow and difficult process of building a common understanding of the challenges facing the community and a shared vision for overcoming them. Intelligent Communities devote time and resources to educating and engaging their citizens, businesses and institutions as true partners in understanding challenges, identifying solutions and planning a better future. Intelligent Communities are also good marketers to the outside world of their digital age advantages for economic development purposes.

# DUBLIN'S GLOBAL ICF INSTITUTE



The Global Institute for the Study of the Intelligent Community

## Overview

The Global Institute for the Study of the Intelligent Community is operated out of the Office of the City Manager with support from Economic Development and Information Technology. The Institute is licensed through the Intelligent Community Forum and exists to provide communities with information, education and support as it relates to the ICF Indicators – Broadband, Knowledge Workforce, Innovation, Digital Equality, Sustainability and Advocacy.

**Institute Vision** – An Intelligent Ohio

**Institute Mission** – Collectively, through leveraging the knowledge and success of the membership, the Institute will serve as facilitator, convener and subject matter expert to:

- Expand Awareness and Advocacy
- Provide Education and Resources
- Exchange Information and Ideas
- Connect Communities and Organizations
- Conduct and Share Research

# DUBLIN'S GLOBAL ICF INSTITUTE

## Accomplishments

- Since its establishment in late 2015, the Institute has held two member workshops each year in 2016, 2017 & 2018.  In 2017 and 2018 keynotes were identified for each workshop to focus on one or more of the ICF Indicators and to draw member interest and increase workshop attendance.

  In late 2106 and into early 2017, five "regional roadshows" in each of the five State regions and two team-based workshops were completed to further awareness of the Institute and educate local government leaders about the ICF and the ICF Indicators.  The Workshops and Roadshows drew the following:

  **Workshops**
  October 21, 2015 | 50 attendees (31 different cities/orgs)
  February 29, 2016 | 123 attendees (74 different cities/orgs)
  November 1, 2016 | 30 attendees (27 different cities/orgs)
  May 4, 2017 | 38 attendees (24 different cities/orgs)
  October 13, 2017 | 45 attendees (34 different cities/orgs)
  May 9, 2018 | 48 attendees (30 different cities/orgs)
  November 9, 2018| 65 attendees (44 different cities/orgs)

  **Roadshows**
  September 20, 2016 | Columbus, OH | 54 attendees (33 different cities/orgs)
  September 20, 2016 | Bowling Green, OH | 38 attendees (27 different cities/orgs)
  September 21, 2016 | Cincinnati, OH | 51 attendees (39 different cities/orgs)
  October 18, 2016 | Athens, OH | 35 attendees (26 different cities/orgs)
  January 24, 2017 | Hudson, OH | 36 attendees (26 different cities/orgs)

  **Regional Team Workshops**
  September 13, 2017 | Zanesville, OH | 22 attendees (15 different cities/orgs)
  September 14, 2017 | Findlay, OH | 17 attendees (12 different cities/orgs)

- The Institute has had a strong presence at the ICF Summit each year assisting ICF with advocacy and building interest in Smart21 applications.

- An Intern is in place to complete research toward the completion of a 2020 Smart21 application for the State of Ohio.

- In 2017, Hudson, Ohio was selected as a Smart21 Community by ICF, the only U.S. city to be selected.  In 2018, the City of Hudson was again selected as a Smart21 Community, joined by the City of Westerville.  Both of these cities were awarded Top7 designations in February, 2019 and will compete for the Top Intelligent Community in the world as part of the 2019 Global Summit in June.

# DUBLIN'S GLOBAL ICF INSTITUTE

## What's Next

- A November 9 Workshop was held with Peter Kageyama, author of *For the Love of Cities*, as the keynote.   While the average attendance at workshops has been 40-45, this keynote was selected with the intent of drawing more and a greater variety of attendees.  Attendee surveys were distributed to evaluate the quality of the workshop and to determine other topics attendees would like to have explored in future workshops.

- The Institute submitted a proposal to host the 2020 ICF Summit in Dublin, Ohio, USA.  In late January, we were informed that Dublin was selected as the winning proposal.  This conference will provide an opportunity to highlight the work of the Institute and to showcase Dublin and central Ohio's Intelligent Community accomplishments.  It will attract more than 200 attendees from across the globe and will include a closing dinner and reception at which the Top Intelligent Community will be named, bringing international awareness of Dublin via media and social media outlets. Planning and sponsorship for this event will be focused on in 2020.

- Continue to collect information and submit an application for the State of Ohio to be selected as a Smart21.

- Continue to promote the ICF vision and indicators among community leaders and to encourage cities to apply for Smart21 recognition, with a goal of 5 communities submitting applications in 2019 and at least 3 of those communities being recognized among the Smart21.

# DUBLINK

## Overview



Dublink is 125 miles of fiber optics that run underground throughout Dublin and many surrounding Central Ohio communities. This City-owned network makes the City of Dublin the best-connected community in Central Ohio and has brought attention to the City in the form of recognition as a top national and global broadband rich environment. Dublink's ultra-high speed and ultra-low latency network connectivity is capable of delivering business traffic at the speed of light and provides a superior choice of service providers and global carrier networks.

Through an agreement with Metro Data Center, Dublink allows access to multiple service providers. Metro Data Center also offers data storage, data backup and cloud hosted services.  Additionally, Dublink provides access to OARnet, the Central Ohio Research Network (CORN), the Ohio SuperComputer, and the National Science Foundation (NSF) Global Environment for Network Innovations (GENI) rack. GENI is a virtual laboratory for exploring future internets and global networks. Dublin is one of very few cities in the U.S. with access to a GENI rack.

## Accomplishments

The City's broadband initiatives began in 1999 when a franchise agreement was established with the Fishel Company to begin installing Dublink within the business districts and to connect City buildings.  Over time with continued investment in the system, access has been extended to more businesses as well as to Washington Township and the Dublin City Schools.

Since its inception Dublink has served as a key economic development tool to attract high tech, research and health care companies to Dublin.  Through connection of City buildings, the City also achieved cost savings and better broadband services (capacity, speed and redundancy).  Between 1999 and 2014 the City invested approximately $5.5 million in fiber installation.  This investment has resulted in an estimated $35 million return on investment through cost savings of City building connections, revenue from leasing fiber to providers and increased tax revenue from attracting new jobs.

In 2015, Dublin began installing Dublink Transport within the Metro Center Business District. Dublink Transport consists of an underground high-speed fiber lateral that connects to the Dublink fiber network through an edge device within office buildings. This 100 Gig fiber network system allows individual office suites to connect through an
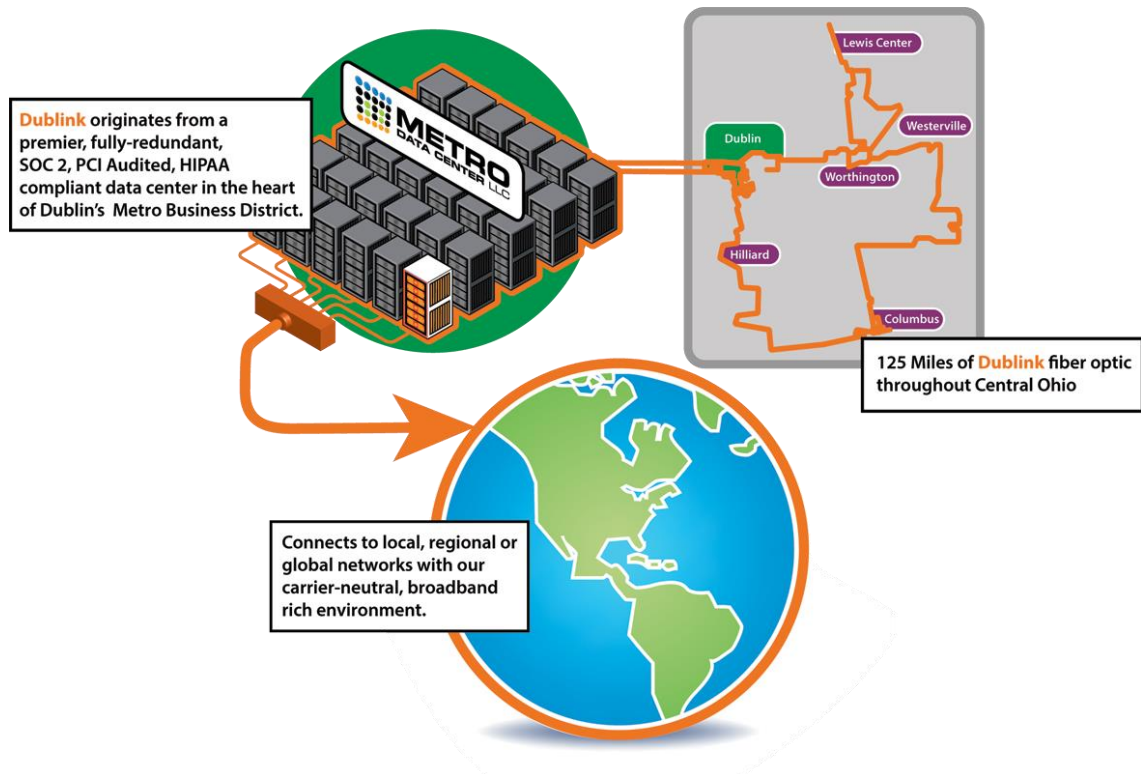
# DUBLINK

optical fiber or copper line.  The network is currently available to small and medium-size businesses in commercial offices located in the Metro Office Park – Upper Metro Place, Metro Place North and Metro Place South.  Companies have access to 13 internet carriers without having to pay for the transport infrastructure and can negotiate the most competitive monthly price for the highest quality internet from their carrier of choice.

## What's Next

- Continued expansion of the network in other commercial areas and expansion of Dublink Transport to additional office buildings.

- Expanding the reach and function of the Dublink network by using the broadband infrastructure in new ways. From a backbone network, a public service delivery infrastructure, and a network traffic backhaul resource to a smart city device network, a connected vehicle connection mechanism, a smart neighborhood delivery system, and wireless communications research platform, our innovation opportunities lie in the expansion of the Dublink system. While the network has long been an enticement to technology dependent businesses, it will now add value to the attractiveness of our business location by serving as a key delivery mechanism for new volumes of data to businesses and researchers.

Dublink originates from a premier, fully-redundant, SOC 2, PCI Audited, HIPAA compliant data center in the heart of Dublin's Metro Business District.

125 Miles of Dublink fiber optic throughout Central Ohio

Connects to local, regional or global networks with our carrier-neutral, broadband rich environment.

## 33 Smart Mobility Corridor

### Overview

Known as "the Midwest's playground for smart mobility technology", this corridor runs from Dublin to the Transportation Research Center (TRC), 35 miles to the west of Dublin.  The project has been made possible through the allocation of a $6 million U.S. Department of Transportation grant, a $15 million State of Ohio grant, and matching funds by Dublin, Marysville and Union County.  This funding will result in an expanded fiber optic network linking to US-33, highway sensors, and retrofitted government and private industry fleets to send and receive data. Once completed, the fiber network will allow automotive testing, R&D, and manufacturing facilities to test smart transportation and autonomous vehicle technologies on US-33, a highway that carries up to 50,000 vehicles per day. This collective platform will serve as a regional and national test center for all things connected and autonomous.

To oversee and manage the development along the US-33 corridor, the NW 33 Innovation Corridor Council of Governments (COG) was established in November 2016. Its overall purpose is to review, evaluate, and make recommendations relative to the planning and programming, and the location, financing, and scheduling of public facility projects within the region that affects the development of the US-33 corridor area.  The COG is comprised of representatives of the City of Dublin, City of Marysville, Union County, and the Marysville-Union County Port Authority.

### Accomplishments

Construction of Phase I of the project was completed in 2018 and included the installation by ODOT of nearly 39 miles of fiber optic cable along the US-33 corridor. Phase II, set to be completed in 2019 by the NW 33 COG, will add an additional 42 miles of fiber along Industrial Parkway from Dublin to East Liberty and throughout the City of Marysville. Combined, these two fiber segments will offer 432 strands of redundant fiber. The COG has executed an agreement with ODOT/Drive Ohio to possess and operate 216 strands of fiber.
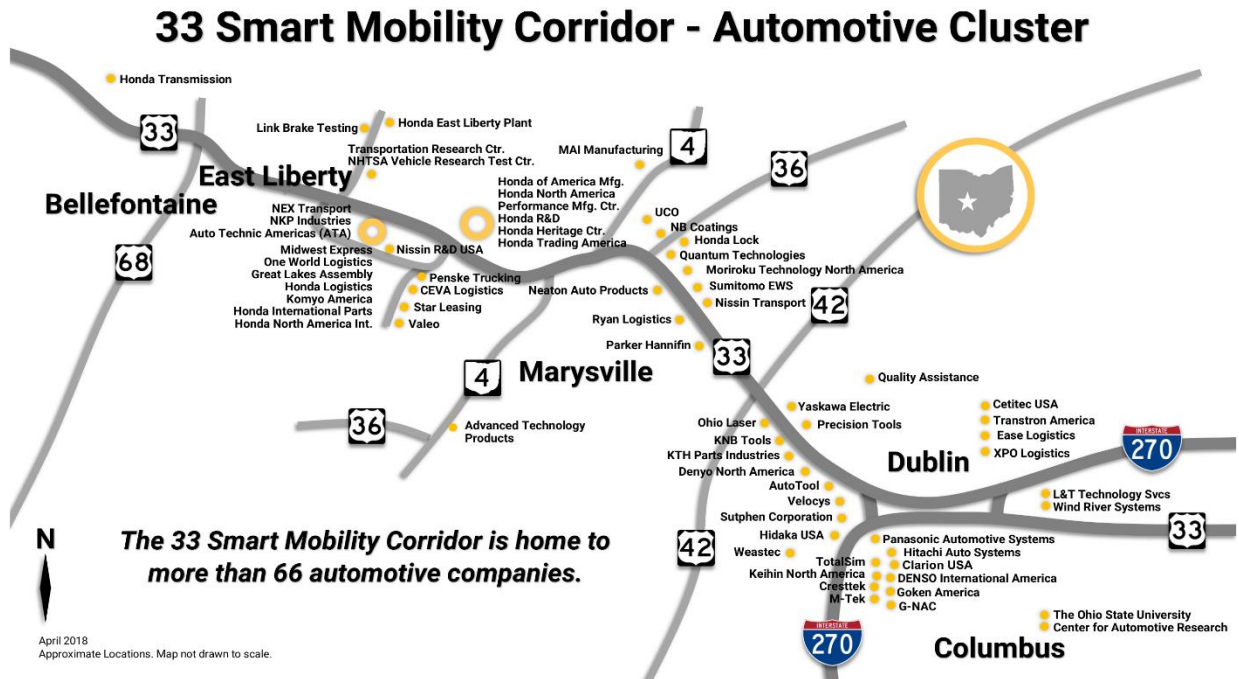
# 33 SMART MOBILITY CORRIDOR

## What's Next

A minimum of 24 strands of fiber is expected to be tested and operational in 2019 to facilitate high speed communications along the corridor. The remaining strands of fiber (432 total) is scheduled to be complete later in 2019. In addition to miles of fiber optic cable, the project also includes 250 pull boxes that will adequately house the cable throughout the corridor.

The COG is proceeding with an immediate pilot deployment of Road Side Units (RSU) at 4 intersection locations in Marysville, and two intersection locations in Dublin. This deployment will be used to validate ODOT's Connected Vehicle Purchase Contract and identify any recommended modifications. ODOT will use these recommendations to make modifications to the purchase contract, which then would be used for the deployment of the remaining equipment within the US-33 Smart Mobility Corridor project area. The RSUs for the pilot deployment will be in "local" operation only (not requiring a backhaul connection), and will be broadcasting Signal Phase and Timing (SPaT) and MAP data according to Society of Automotive Engineers (SAE) formatting requirements. The pilot will also serve as part of the development of the system engineering analysis, in that it will allow proof of concept and therefore help mitigate risks associated with infrastructure deployment. The pilot deployment is intended to be completed by the end of 2018.



33 Smart Mobility Corridor - Automotive Cluster

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

April 2018
Approximate Locations. Map not drawn to scale.

**INNOVATION FRAMEWORK**

## Connected Vehicles Technology - Roundabout Application & Corridor Project

## Overview

Dublin is partnering with DriveOhio on this significant and unique connected vehicles technology project is unique as it incorporates a multilane roundabout (located at S.R. 161 and Riverside Drive) within signalized corridors.  Approximately 45,000 vehicles travel through this intersection of each day and the project serves as an important extension of the 33 Smart Mobility Corridor through Dublin. We anticipate Dublin will be the first in the country to develop and test connected vehicle applications for roundabouts.  This initiative will solidify Dublin role as leaders in emerging transportation and information technologies. It is also unique because it conducts both a research and an operations study by:

- Developing a pilot program to automate data collection to quantify vehicle performance in a complex roadway network with traffic signals and a multi-lane roundabout using Connected Vehicle principals and devices.

- Collecting driving information of circulating vehicles in the roundabout including location, speed, critical headway, etc. and ultimately help approaching vehicles decide whether to enter the roundabout on the basis of calculated gap acceptance and integrate this information with data collected at the adjacent signalized intersections in the roadway network.

- Identifying needed performance measures and data necessary to calculate– with nationwide benchmarking to ensure work is state of the art.

- Evaluating available technologies and devices and developing a dashboard solution application to display performance measures.

## Accomplishments

A partnership with DriveOhio was formalized with an agreement that was approved by Dublin City Council and executed by the City Manager and Director of ODOT. DriveOhio will reimburse Dublin 21% of the project costs. Following a competitive, quality-based selection process, a team led by Michael Baker International was selected to deliver this project. The team includes Bosch, Kittleson, and Treehaven.

## What's Next

Staff is finalizing the contract with Michael Baker and working to involve an institution of higher education as a project partner. Design and implementation to occur in 2019.

## Smart Parking System – Pilot Deployment

### Overview

Dublin recognizes the opportunity to leverage smart parking technology to manage valuable land in the Downtown to park vehicles and automatically collect data and report pertinent performance measures to the benefit of the City, while balancing the needs of our businesses and community. We anticipate Dublin will be the first City in the country to utilize a "mobile only" (no kiosks or meter infrastructure) system to manage its parking resources. The principles and objectives of this pilot project are multi-fold and include:

- Parking is a key ingredient to the overall success of the City;

- Parking must meet the needs of a diverse group of stakeholders and must be customer focused;

- Parking must be well managed as a sustainable asset;

- Parking must be integrated into the overall transportation and mobility systems;

- Parking management must use leading edge technology that is scalable and expandable in the future;

- Parking supply and demand must be evaluated and detailed in reporting;

- Parking management must improve overall parking administration and operations.

### Accomplishments

Several vendors have shown an interest and demonstrated their technology to City staff.  Staff has drafted an RFP to develop a pilot project that includes three parts:
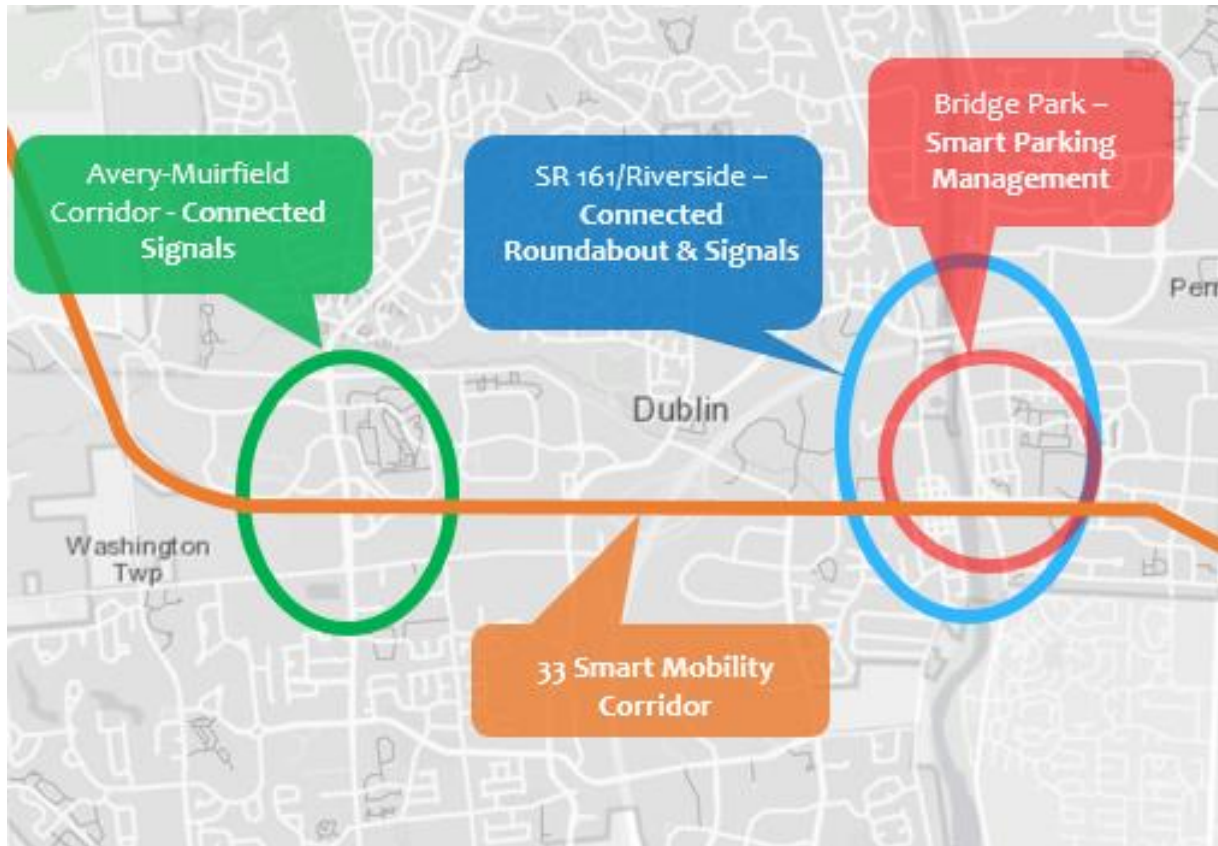
- Implement a smart parking guidance, communication and monitoring system for certain surface lots and on-street parking spaces in the Downtown area,

- Implement a complete mobile parking payment system that will also include a smart parking guidance, communication and monitoring system for on-street parking spaces only in the Bridge Park area.

- Aim to develop a demonstration project with a private lot owner in Historic Dublin using the same mobile parking payment system to educate private lot owners how to monetize their parking asset and encourage other private owners to do the same.

# 33 SMART MOBILITY CORRIDOR

## What's Next

A Request for Proposals has been drafted and will be released in December of 2018 for selection of a vendor for the pilot deployment. Implementation is planned in the first quarter of 2019 upon approval of City Council.



Avery-Muirfield Corridor - Connected Signals

SR 161/Riverside – Connected Roundabout & Signals

Bridge Park – Smart Parking Management

Dublin

Washington Twp

33 Smart Mobility Corridor

Perr

**Connected Dublin - Integrated Smart Mobility Corridor**

**INNOVATION FRAMEWORK**

## Vantage Vector Intersection Detection System

### Overview

This project will be the first installation of its kind in Ohio as it uses the Iteris Vantage Vector state of the art intersection detection system that incorporates both pedestrian and cycle tracking in addition to enhanced vehicle detection. There are only about 50 such implementations in the country. The system will be deployed at the Emerald Parkway/Coffman Road/Coffman Park Drive intersection. This intersection was chosen to pilot this technology as about 32,500 vehicles travel through the intersection each day with numerous pedestrians and cyclists moving through as well.  With the proximity of Dublin Coffman High School and the new Emerald Campus in operation, the pedestrian and cyclist-rich environment is ideal for this type of application.

The Vantage Vector detection system will provide enhanced dilemma zone detection, reducing the number of drivers caught between deciding to continue through a yellow light or stopping for it, vehicle volumes, speeds and distances.  The VantageLive! data service will enhance Dublin's capabilities to understand the true multi-modal nature of the intersection starting with the pedestrian and cyclist behaviors occurring here.  This cloud-based service will provide more detailed information regarding vehicle turning movements and departing data, which will provide a more robust data set to optimize our signal timings and generate peak hour reports.  By using the bicyclist and pedestrian enhanced features, Dublin will receive automated bicycle counts, bi-directional pedestrian counts, speed data, and pedestrians in the walkway alerts, if desired.

### Accomplishments

A purchase of the Vantage Vector intersection detection system was placed and was received at the end of 2018.

### What's Next

Staff is finalizing the data service plan and fee with the vendor to ensure all desired applications are included. Installation of the intersection detection system to occur once hardware is received. Cloud based data service to follow in 2019.

# BLOCKCHAIN



## Overview

The City wishes to prove the viability of a Blockchain based personal identity system validated and supported by a local government. The project will implement distributed ledger/blockchain technologies. To begin, the City hopes to prove the viability of Identity, basic voting, opinion survey, and a token of some arbitrary value. It is the City's belief that more robust applications of Blockchain technology may become commonplace and so the City desires to establish a base technical foundation upon which it will build additional functionality. This project will also allow the City to develop skills and expertise around this emerging technology.

Blockchain Technology has the potential of disrupting a number of government service areas. There is potential that citizens may accomplish new levels of data privacy and data security. Local government administration may also transform internal operations as well as service delivery. The potential for these advances is limited due to a lack of proof that the use cases are viable and a lack of trust in the technologies. While proving the viability of a sustainable Blockchain based network platform, the City hopes also to educate a community of users on the technology. By demonstrating a few basic functions of data collection, privacy, security, and use, the City will establish a foundation upon which to build more sophisticated applications.

The City has also formed a Dublin Blockchain Group that is conceived as a Meetup for local businesses, experts, or thought leaders in Blockchain technology, to connect, present, and network around this technology. The kickoff meeting had over 50 professionals in attendance, including startups, venture capitalists, software companies, universities (OU and OSU), and state government representatives (the Ohio Super Computer Center). There is great potential to form a consortium of fee paying members

# BLOCKCHAIN

as the basis of a partnership to develop Blockchain based products and services. We see this as a method for developing innovation in this space for low risk, low investment, and as a model we can replicate for additional technology types.  We intend to use this model to acquire technology that can be used for the Identity Layer described above and in the Dublin Smart Structure Strategy.

## Accomplishments

An RFP was issued and the City awarded a contract to Software Verde to partner with the City on a Proof of Concept to demonstrate the successful function of four use cases. The project has been kicked off and the technology is under development. The City expects to have tangible proof of the use of the technology by Mid-2019.

## What's Next

- The City continues to build a technology community around Blockchain and Distributed Ledger technologies. By continuing the organizing of events with the Dublin Blockchain Group, the City is coordinating the project with other regional efforts, including those by large companies, startups, other Cities, and the State of Ohio.

- After successfully proving the technology we plan to initiate additional projects to layer production applications on top of the base infrastructure. These additional applications may involve new service types to the City of Dublin or represent transformations to the way some existing services are performed.

# Data & Predictive Analytics

DATA → KNOWLEDGE → ACTION

## Overview

Given the very large amount of data the City has located in dozens of systems and files, and the amount of new data expected to flow into the City as the result of several new systems, a new robust Data Platform is being built to gather, track, manage, analyze, and visualize the City's data within a single source and a single view. The City began performing regular briefings to the City Manager, from every department/division, using their own local performance data/metrics, from preferred systems of record, to provide a view of what they measure that tells the story of how well they are performing. This exercise has provided some consistency across departments as divisions hone in on a top three to five key measures, backed up by data, to indicate performance outcomes.

This activity presented an opportunity to capture each of those measures and present them as the "Heartbeat of the City". Instead of pulling the data out of files or systems of record and building reports each time a team reports, it made sense to automate the gathering of data using software, and building the dashboards permanently so they could be viewed in real time. The City did not have a single data platform that could pull data from all of the different sources among the various departments, so a new platform has been designed to gather, analyze and present departmental data, whether it be pulled via a query from a cloud based service we subscribe to, or pulled from a spreadsheet on a manager's computer. The platform will be the new home for this data, from which we can build new analytical tools, services, and reports. A great opportunity is the combining of these data sources across departments so City leadership can build visualizations and analyses based on data from several departments, not just one, and users will be able to do this without approaching the department itself. The data will be freed from the confines of individual departments.

The advantage of building a new custom platform is that future data sources, such as those coming from Connected and Autonomous Vehicle research, Smart Parking initiatives, and other Smart City programs, will have a destination. From now on, all new systems will be tied into the City's Data Platform.

# DATA PLATFORM

## Accomplishments

- The City asked Dublin-based Gathi Analytics to perform a proof of concept to show how our existing data could be visualized consistent with the Heartbeat of the City vision of the City Manager. They were able to demonstrate how the infrastructure can be built, scaled, maintained, and managed by City staff.

- The City has engaged Gathi Analytics to further develop the platform and has entered into a service contract to build Dublin's custom centralized Data Platform.

- IT has assigned a project team and kicked off an official project to work through the City, department by department, preparing a true functional platform capable of presenting real time visualizations to the City Manager, City employees, and ultimately the public.

## What's Next

- The platform is expected to be functional by June 2019.

- IT will manage the platform through the following year, gaining expertise.

- Opportunities will be explored to integrate the platform with other external data sources and platforms. We will create visualization of City data for Smart City displays around the City so residents and other stakeholders can engage with the data as well.

INNOVATION FRAMEWORK



## Overview

The City has an interest in using Artificial Intelligence and Machine Learning to perform more advanced analyses with existing data. The City believes that engaging with these kinds of technologies will provide us with experience and capabilities we will need in the near future.

Capitalizing on these interests, the City considered the question of being able to predict annual revenues using historic data. Local technology services company Jasstek presented an opportunity to test this theory using historic tax data. Given certain data privacy concerns and requirements, the City was not able to remove this data for analysis. Jasstek was nonetheless able to deploy a Machine Learning analytics model inside a secure area of the City and perform predictive analytics on our tax data.

There is potential for application of this technology in several other parts of the City, having learned a great deal about the potential and limitations of this technology. Unfortunately we have also learned that the revenue predictions we thought we would learn about are not the ones we produced. It became clear to us that this analysis, while useful, does not answer questions about the drivers of revenue projections as was hoped. The technology is limited in that it can only work with the data points that are available to it.

In this proof of concept case we have learned that the technology can be deployed successfully and will deliver results with a high degree of accuracy, and we have learned that we need to keep working to get a revenue prediction model that focuses on Economic Development data points. It is expected that we will be in a position to gather this data as we mature and scale our Data Platform project.

## Accomplishments

- Engaged Jasstek in a Proof of Concept (POC) to perform Machine Learning on historic data from our tax division.

## What's Next

- Complete the Central Data Platform pilot project, identifying data sources throughout the City reflecting items of interest for further analysis on a wider scale.

- Identify business questions around the City for which we would like to engage in predictive analysis.

- The City will determine how large the demand and opportunity is to extend the proof of concept beyond the Finance Department and look to build a more robust, permanent, Machine Learning practice.

INNOVATION FRAMEWORK