City of Henderson
Smart City Strategy

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Final

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Message from the Mayor

"From smart students to Smart Cities, Henderson has embarked on an ambitious plan to harness technology and data to improve everything from transportation infrastructure to public safety and transparency. We have already made investments in becoming a Smart City that are linked to areas such as traffic management, city facilities and emergency response, and there's still more to come.

By collecting and analyzing data from sensors, cameras and other technologies, the city is creating systems capable of recognizing changing conditions such as traffic congestion and responding automatically. This has produced increases in efficiency, public safety and cost savings. Investing today in Smart Cities technology will pay increased dividends tomorrow by enhancing Henderson's economic competitiveness as companies look for communities that are on the cutting edge when it comes to data-driven solutions to urban challenges...

From a small town to a Smart City for the 21st Century, Henderson continues to evolve as one of America's premier communities, but at its heart, it will always be a very special place to call home for both our residents and our business community."

Mayor Debra March

Las Vegas Sun: "Henderson getting stronger, smarter"
September 3, 2017

What is a Smart City?

A Smart City uses modern, connected technology and data sharing to bring together government, private sector, and non-profits to drive positive citizen / social impact in continuously innovative ways.

Every City is different... Each city has a different point of view on how best to use technology to benefit its citizens. To some, a Smart City is a technology showcase - a technology-intensive city where Internet of Things (IoT), robots, and autonomous vehicles play a dominant role in delivering efficient and effective services to the citizens.

To others, a Smart City resembles an ecosystem where technology is used to improve the relationship between citizens and their government, enable social innovation and improve the quality of life across their community.

For the City of Henderson, we will strike a balance between the two perspectives by deliberately investing in technology to deliver high citizen value and achieve our civic aspiration to be "a place to call home".

Executive Summary

Henderson is a Smart City. Due to a forward-thinking, "**smart growth**" approach to urban planning, Henderson has evolved into a safe community that residents and businesses consider as a great place to live, learn, work, and play.

Connected technologies support the everyday lives of our residents and businesses today:

- **Dimmable lights on trails** help keep hikers and bikers safe, while conserving energy
- **Solar-powered beacons** alert drivers of students crossing roads
- **Opticom technology** provides first responders right-of-way through intersections during emergencies
- **Automated irrigation controls** help conserve the water used for our parks
- **Predictive controls** monitor our infrastructure to maintain a safe water supply.

The implementation of these technologies contribute to the livable and family-friendly community we are proud of. However, we can do more to plan, invest, and deploy technology to maximize citizen value and engagement.

By 2036, we expect Henderson to grow from 300,000 residents to almost 400,000. Wise technology investments today will enable us to support this growth while continually improving the quality of life for our residents and businesses.

Becoming a **Smarter Henderson** will help:

- **Facilitate more economic development –** As experienced by cities across the US, consolidating City initiatives under a single 'Smart City' brand, offers an attractive and compelling value proposition for attracting investment from public and private partners.
- **Achieve Henderson's premier community aspirations –** Strategic use of digital technologies is critical for meeting citizens' expectations for personalized, consumer-grade services.
- **Enhance quality of life for all citizens –** Using digital and connected technologies to bridge the digital divide and support our increasingly diverse community are vital for developing a vibrant and resilient economy.

Executive Summary

In Fall 2017, the City established a **Smart City Working Group** comprised of City managers and staff to draft a citywide approach to Smart City Strategy and Roadmap development. While some cities support their Smart City journeys largely through experimentation, we are choosing a more deliberate, collaborative approach that will encourage innovation and creativity while maintaining a clear-eyed focus on delivering tangible outcomes.

Over a brief 14 week timeframe, the City's Smart City Working Group collaborated with Gartner Consulting to develop the enclosed draft Smart City Strategy and an accompanying roadmap. We gathered insights and ideas from various departments, the Governor's office, Clark County School District (CCSD), and University of Nevada, Las Vegas (UNLV) and prioritized these ideas into a starting set of initiatives using evaluation criteria related to Citizen Value, Resources, Use Cases, and Cost-Effort.

The end result is a Smart City Strategy that will serve as a "living document" – one that will evolve with the rapid pace of technology and changing citizen expectations. This is a starting point for an engaged and collaborative partnership among citizens, businesses, academia, and government.

The starting set of initiatives outlined in this document align with and support the overarching goals identified in the Henderson Strong Comprehensive Plan for:

- **Healthy, Livable Communities**
- **Vibrant, Resilient Economy**
- **Active, Complete Transportation**.

Focus areas and initiatives will evolve and adjust over time as results are achieved. Current focus areas include: Citizen Services, Public Safety, Education, Transportation, and City Government.

While Henderson Strong serves as the City's citizen-built vision of Henderson's future, our Smart City Strategy has a shorter-term outlook and a technology-centric focus. It is designed to guide an incremental, iterative deployment of digital, connected technologies over a 1 to 3 year horizon.

In early 2018, we will engage with citizens, the vendor community, and regional leadership from the County and State to finalize our approach and prioritized list of initiatives and begin steps for execution. Together, we will craft a uniquely Henderson approach for using technology to address today's challenges and create tomorrow's opportunities.

What a Smarter Henderson Looks Like

Smart City Vision Statement:

To wisely integrate technology as we continually improve the quality of life in our community

Aided by more strategic technology choices through Smart City Planning, we envision Henderson becoming an even better place to live and raise a family. Beyond serving residents within the City, Henderson seeks to become a leader and nationally recognized role model in areas such as education and delivery of premium, personalized city services.

Collaboration   Citizen Value
Role Model   Pride in community   Be Yourself
Professionalism   Fun with family, weather permitting
No snow   innovative
People   8 minutes to my desk   Born & raised
Leader   Concierge-Level Service
Great place to be   Sustainable
Love it here, native   Love living here (parks)   Work/Life balance
Seamless   Community – working with family
Fantastic location with proximity to recreation
Vibrant   Great place to raise a family

What a Smarter Henderson Looks Like

As a Smart City, Henderson will:

- **Become recognized as a leader and role model** in the seamless delivery of personalized, premium city services that meet the anticipated needs of our residents and businesses. We will attract and develop top talent by collaborating with universities and our school district to innovate and expand learning opportunities outside of traditional school boundaries.

- **Keep our residents and businesses safe** through continuously innovative, predictive technology that improves response time and situational awareness despite our city's fast growing population and expanding geographical boundaries.

- **Bridge the digital divide** by finding creative ways to provide the necessary connectivity to support our underserved populations / neighborhoods.

    - **Be innovative, but citizen value focused in our technology investments.** We will openly and collaboratively explore technology ideas and solutions, but remain disciplined in our investment and implementation approaches. We will avoid supplier lock-in. While we intend to be project-focused and driven, meeting deadlines is not our end goal. Our end goal is the delivery of solutions with high citizen value and a premium user experience via thoughtful, human-centered design.

    - **Remain true to our core values and the tenets that make Henderson a premier community.** We will remain focused on being a forward-thinking, progressive city with a "small-town feel". Our Smart City initiatives will feel "genuine" to our citizens and be aligned with our civic aspirations, as highlighted in Henderson Strong and reflected in our strategic plan.

    - **Provide environmentally sound transportation choices** that allow all our stakeholders to thrive and prosper, including seniors, students, and less affluent residents.

    - **Run an efficient, collaborative, and transparent City Hall** that continuously improves cross-departmental coordination and data-sharing. We will define operational approaches and priorities through a participatory governance process and active citizen engagement.

Goals

01 **Healthy, Livable Communities**
Focus: Citizen Services
Focus: Public Safety

02 **Vibrant, Resilient Economy**
Focus: Education

03 **Active, Complete Transportation**
Focus: Transportation

Goal One:
Healthy, Livable Communities

Communities that promote healthy living are designed to be safe, walkable and bikeable, free of pollution and have easy access to health care and social services, fresh food and parks and recreation. By providing opportunities for regular physical activity in a safe, clean environment, residents experience positive health outcomes and community interactions. *(Henderson Strong, May 2017)*

Goal One: Healthy, Livable Communities

Focus: Citizen Services

Henderson is home to approximately 300,000 residents who take pride in their community and value the unique attributes that enable an enhanced quality of life, including National Gold Medal Winning parks, trails and facilities, progressive planning, and a variety of cultural programs. To maintain and continuously improve our quality of life, we are seeking ways to use technology to optimize the use of existing City amenities and assets, facilitate a culture of inclusion across our increasingly diverse community, and ultimately serve as a leader / role model in delivering concierge-level citizen services.

Two Way Translation Services

*Support our increasingly diverse community by providing real-time 2-way translation capability between English and popular languages and dialects using **market-available artificial intelligence (AI) / machine learning-based tools**.*

We will conduct low-cost pilots to assess their effectiveness in supporting use cases, such as passport processing, prior to expanding its use in public meetings and forums.

Modernize / Expand City Apps

*Enhance or replace the apps currently available to the City's residents. Ideas include adding **real-time location services** to find and reserve City facilities from **mobile devices** (e.g., swim lanes, tennis courts, picnic areas) and using innovative technologies (like **smart benches, digital signage, interactive maps**) to improve the citizen experience while gathering insights and data that the City can use to continuously improve services.*

Goal One: Healthy, Livable Communities

Focus: Citizen Services

Smart Water Meters

*Consider use of **sensor-based** smart meters to expand water conservation efforts. Work with developers to determine approach for incorporating smart water meters into new buildings and communities.*

Personalized Concierge City Services

*Leverage advancements in **AI and analytics** to develop app(s) that proactively present information and facilitate personalized services for residents and businesses (e.g., offer **"Google-like" ease** and **recommendation features** to enroll in schools, sign up for water services, pay permit fees, etc.)*

Smart City Ambassadors

*Couple IT initiatives with personalized "**high touch" services** by enlisting the help of ambassadors, such as: the City's current volunteer groups, students, and retirees. They can help conduct workshops using human-centered design approaches, gather data, test smart city ideas, and facilitate outreach.*

Goal One: Healthy, Livable Communities

Focus: Citizen Services

Some things we can do as a Smart City...

Help prevent our residents from getting lost and increase their enjoyment of our trails by improving / expanding signage with digital signage that provides interactive functions and WiFi access. Depending upon the supplier, additional City revenue is possible through digital advertising.

Better communicate with our residents and improve customer service through real-time translation.

Municipal Pool at Heritage Park

Enable residents to locate and reserve City facilities (such as swim lanes) with "one-click ease".

Current Trail Connections Signage at Pittman Wash Trail

Goal One: Healthy, Livable Communities

Focus: Public Safety

Henderson is widely recognized as **one of America's safest cities**. Through sound investment and implementation of technology, first responder resources, and community outreach, we proudly uphold a high standard for response time and maintain a trusting relationship with citizens.

However, it is increasingly difficult to maintain our "hello-to-hello" track record due to Henderson's growing population, expanding geographical boundaries, and aging critical systems. Smart technology initiatives will help achieve the cross-agency collaboration needed to keep Henderson safe by:

- **Improving response time**
- **Enhancing situational awareness**
- **Increasing first responder coordination**

Goal One: Healthy, Livable Communities

Focus: Public Safety

Response Time Analysis

*Deploy **sensors**, use **advanced analytics** and other instruments to provide insights into how to better coordinate and sequence emergency response services activities. Optimizing the sequencing and activities of first responders will reduce overall response times and provide a mechanism for continuous improvement. Other initiatives include:*

- ▪ ***Analytics to support public safety services deployment*** *– This initiative uses **predictive analytics** to adjust deployment models on an ongoing basis. For example, for Police, this may entail modeling crime patterns while geography and population density mapping would be conducted to support Fire department services.*

- ▪ ***City-wide Integrated Operations Center (IOC)*** *– Expeditiously mobilize multi-agency emergency response by providing a consolidated view across the entire City, with data feeds and alerts from various public safety systems and applications.*

- ▪ ***Replace data cards with FirstNet*** *– Improve response times and data-sharing by migrating to FirstNet's nationwide interoperable network that is used by public safety agencies across the country.*

Increase First Responder Coordination

Use technology to facilitate stronger integration across first responder agencies, such as:

- ▪ ***Videoconferencing for incident coordination and operational efficiency*** *– Accelerate the mobilization of first responder teams by communicating critical instructions across multiple stations simultaneously, as well as standardizing operating procedures during non-emergency times.*

- ▪ ***Device-Assisted Mapping*** *– Enhance field devices with capabilities such as **Augmented Reality** to increase the detail and accuracy of mapping data available to first responders.*

Goal One: Healthy, Livable Communities

Focus: Public Safety

Drones as Assessment Tool

Use drones to provide initial assessment footage of accident and incident sites, disaster zones and hard-to-reach locations at a fraction of the cost and time of using a helicopter or plane. Multiple use cases have been identified for Henderson, including:

- *Incident management*
- *Search for hurt or lost residents on hiking and bike trails*
- *Assess potential repair conditions:*
  - *Roads*
  - *Potholes*
  - *Utility breaks*
  - *LIDAR (utilities)*

These types of initiatives must include an analysis of privacy implications and establishment of related regulations and procedures.

VideoHub for Incident Tracking

Implement VideoHub capabilities to allow real-time live streaming video for incidents.

The goal is to integrate video feeds from all first responder units (Police, Fire, EMS) and eventually include facilities (courts, jail, EOC) in order to improve situational awareness. Currently implemented in beta, the City's system operates on broadband cellular and delivers HD video with cellular connection to deliver data to one screen.

Additional Sensors

As a follow-on phase, consider installing additional sensors (e.g. shot spotter, environmental sensors for chemicals) in priority locations to build the GIS layers needed to further enhance citywide situational awareness.

Goal Two: Vibrant, Resilient Economy

A strong economy that can endure changing cycles of investment is critical to the long-term well-being of the community... Targeted business development activities, coupled with a strong commitment to workforce development and quality education, contribute to the stability and prosperity of the city. *(Henderson Strong, May 2017)*

Goal Two: Vibrant, Resilient Economy

Focus: Education

The Henderson Premier Schools Partnership was established to focus investment in local education initiatives and programs to improve student achievement in schools, support educational providers and enhance student learning environments in Henderson.

This collaborative effort, involving Henderson's Community Education Advisory Board , the Clark County School District, the City and the Community is focused on the continual improvement of public education in Henderson.

A smart city is a connected city...

With the quality of education being among the highest priorities in our community, Henderson has an opportunity to serve as a regional leader and role model. Included in our Smart City Strategy are several initiatives focused on building these connections by bridging the digital divide and innovating learning opportunities.

Goal Two: Vibrant, Resilient Economy

Focus: Education

Internet Access for Underserved Areas

Bridge the digital divide to students' anytime / anywhere access to educational opportunities and increase economic opportunities through expanded internet connectivity. Implementation steps include:

- *Establishing a loaner hotspot program*
- *Enabling access to CCSD app to facilitate parental and guardian engagement*
- *Providing WiFi access in the City's recreational facilities*
- *Working with provider(s) to offer discounted WiFi offerings to families in need*

Lyal Burkholder Middle School and surrounding area. Potential implementation site.

Goal Two: Vibrant, Resilient Economy

Focus: Education

K-12 Smart Technology

Support the multi-year Nevada Ready 21 (NR21) initiative for implementing one-to-one student computing that provides students with a personal, mobile learning device to which they have 24/7 access. The pilot phase of NR21 targets middle schools, while future phases will target high schools.

Innovate Learning Opportunities

With the establishment of the Community Education Advisory Board (CEAB), Henderson can help innovate learning opportunities and accelerate N21 outcomes by working with CCSD and local schools on initiatives, such as:

- *Student Smart City Projects - Offer competitions, internships and opportunities to participate in Smart City projects*

- *Add Open Data to Curricula - Incorporate open data and Smart City data projects into existing school curricula*

- *Peer Tutoring Apps - Empower students to improve performance by helping them pilot or build peer tutoring apps*

- *Smart City High School – Partner with CCSD and a local school to shape a STEM+ and/or Smart City High School curricula. Partner with a developer for implementation in a future school.*

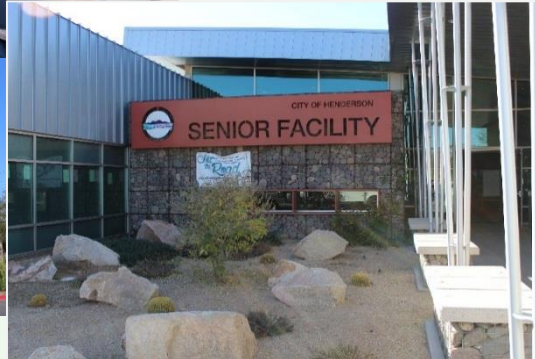# Goal Two: Vibrant, Resilient Economy

Focus: Education

Heritage Park Senior Facility

James I. Gibson Public Library

Digital Literacy Programs

Continue digital literacy courses at the senior centers to help prevent digital fraud and facilitate seniors' adopting of digitally-delivered services (e.g., telemedicine).

Provide assistance to Henderson schools as needed to facilitate technology-enabled graduates (e.g., open/free digital literacy curricula).

Workforce Development

Developing and attracting talent is a vital strategy for building a vibrant and resilient economy. Promising partnerships include:

- *Governor's Office for Economic Development – take advantage of potential for funding key IT positions*
- *Educational institutions – partnerships with the Clark County School District (CCSD), University of Nevada, Las Vegas (UNLV) for research, internships and idea incubation, and other schools and universities local to Henderson*

Goal Three:
Active, Complete Transportation

Thriving cities have a high-quality, complete transportation network. Mobility in Henderson has long been supported by a growing network of roads and freeways, resulting in an auto-centric culture. As more residents seek to spend less time driving, the City will focus on policies that facilitate more compact development, help residents increase their use of transit and expand opportunities for people to walk and bike to their destinations. The City will also keep an eye on new transportation technology, such as self-driving vehicles.
(Henderson Strong, May 2017)

Goal Three: Active, Complete Transportation

Focus: Transportation

Diversifying transportation options and reducing reliance on single-occupancy vehicles for commuting requires partnership with regional transportation agencies like the Regional Transportation Commission (RTC). As a Smart City, Henderson will actively support regional efforts to plan and fund the expansion, operation and maintenance of transit systems and routes. We will also participate in initiatives aligned with Complete Street policies to enable safe access for all users and modes of transportation and help prevent future pedestrian fatalities on major thoroughfares, such as Boulder Highway.

Big Data for Trip Modeling

*Leverage **big data analytics** for transit planning, trip generation modeling, and identifying high-accident locations for autos and pedestrians. Collect traffic data near real-time from vehicle GPS, smartphones, etc. to identify anomalies in traffic flow that may be caused by construction-related lane closures or accidents and optimize traffic flow .*

Share data and analysis with regional partners such as RTC and Nevada Department of Transportation (NDOT) to assist them in developing policies and making technology investments that best support Henderson's traffic-related challenges.

Mobility Marketplace App

*Support regional effort to develop and deploy **mobility marketplace app** to help inform travelers about transportation options and provide **simple payment choices**.*

Goal Three: Active, Complete Transportation

Focus: Transportation

Telematics

Improve operational efficiency by using **telematics / sensors / Internet of Things** technology in City vehicles to document pavement conditions, potholes, and traffic congestion. Conduct initial pilots to test functionality for tracking vehicle locations and transit progress while improving driver and fleet performance and the City's carbon footprint

P2V Tech

Serve as a test bed for emerging transportation safety technology by equipping City vehicles with **Pedestrian-to-Vehicle (P2V)** detection technology.

Power Spike/Street Lamp Monitoring

Proactively prevent safety issues by monitoring electric current drops / spikes across the City's street light network to identify possible lamp outages.

In the near-term, we will take advantage of opportunities to innovate and improve operational efficiency, as noted in the initiatives listed here. As a longer-term strategy, we will monitor industry progress in maturing autonomous vehicle technologies and partner with regional agencies and the private sector to integrate this technology in our Smart City planning.

The Path Forward
Preparing for our Smart City Journey

City of Henderson – Water Street Redevelopment Concept

The Path Forward: Preparing for our Smart City Journey

Focus: City Government

Becoming a Smart City is not just about using new technology to better administer municipal programs. It is about establishing a collaborative ecosystem that brings together residents, businesses, industry, academia, government, non-profits and other stakeholders to ideate and implement solutions that maximize citizen value.

While some solutions will improve operational efficiency, being a Smart City means finding and acting upon key opportunities to rethink and innovate how we conduct business and interact with our citizens.

Our path forward as a Smart City means completing many critical steps and working closely with our stakeholders to expand our:

- **Program leadership and governance processes**

   We will establish a **Participatory Governance** process, including an approach for citizen engagement and the definition of the performance metrics / KPIs we will use to measure success and **Citizen Value**.

- **Collaborative Partnerships**

   We are seeking public and private partners, as collaboration is critical for incubating great ideas and implementing our Smart City Strategy. We are exploring the establishment of a Smart City corridor as part of the Water Street redevelopment effort to serve as a hub for developing solutions that deliver citywide benefits.

- **Internal Capabilities and Delivery Capacity**

   We have much to do to expand our capabilities and assets to support our Smart City journey. We welcome ideas and collaboration in many areas, including: **Data & Analytics** (e.g., expansion of our open data program), **Security & Risk Management**, **Enabling Technologies & Assets** (e.g., identification and investment in critical IT platforms and infrastructure), **Workforce Capacity** (i.e., especially in the areas of: data science, mobile app development, agile program management, solution architecture, organizational change management), and human-centered design approaches in order to deliver a consumer-grade **Citizen Experience.**

The development of our draft strategy is just the start of our Smart City journey. We look forward to engaging with citizens, the vendor community, and regional leadership from the County and State in early 2018 to finalize our approach and initiate steps for execution.

The City of Henderson is honored to prepare this initial Smart City Strategy draft on behalf of our community. We look forward to working with our residents, businesses, educational institutions, private sector partners, non-profits, and regional government partners to develop innovative and insightful ways to address municipal challenges and improve our quality of life.

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Mayor and City Council:

- Mayor **Debra March**
- Councilwoman **Gerri Schroder**
- Councilman **Dan Shaw**
- Councilman **John Marz**
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