CITY OF CHULA VISTA

SMART CITY

STRATEGIC ACTION PLAN

2017




Public Safety • Government & Agency Administration • Operations • Buildings
Environment • Energy • Water
Transportation
Communications • Education • Smarter Care • Social Programs
CITY OF CHULA VISTA
SMART CITY

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EXECUTIVE SUMMARY

Rapid technological development and innovation has created an exciting array of opportunities for city governments. The technology industry is increasingly working to develop software, devices, network solutions and other tools that meet the specific needs of government agencies, with applications in everything from public safety to energy management to library operations. Collectively, these advancements have come to be known as smart city solutions.

For the City of Chula Vista, being a smart city means using technology and advanced data analytics tools to grow the economy, engage the community, improve government efficiency, and enhance quality of life. If applied well, smart city technologies can lead to more jobs, less crime, fewer traffic jams, and a stronger, more equitable community.

The opportunities presented by smart city solutions, however, do not come without risk. Without a clear sense of direction or standards, cities risk wasting money on frivolous or ineffective gadgets. Many cities have struggled with negative reactions due to poorly-considered policies. Other cities have made themselves vulnerable to privacy and public safety threats by maintaining unreliable or insecure networks.

This strategic action plan is designed to help the City identify areas of opportunity, prioritize desired outcomes, and anticipate and mitigate risks. The result is a set of goals and corresponding initiatives around which City leaders will organize their efforts over the next few years.

The objectives in this plan are broadly categorized into four goals:

- Connected City
- Responsive City
- Transparent City
- Innovative City

Each of these four goals comprises multiple corresponding objectives, and each objective includes the top priority initiatives that will help the City meet that objective. The objectives and initiatives are not laid out in a chronological order; much of this work will be occurring simultaneously. Some of the initiatives may be considered "low-hanging fruit" that can be achieved in a period of six months to a year, while other initiatives will require a much longer time horizon.

The goals and initiatives in this plan were developed based on an extensive series of interviews with City staff and community stakeholders, as well as an informal public opinion survey. This research effort revealed a widespread sense of pride in the way the City provides a high level of service with a lean staff, as well as support for the way the City is constantly innovating. For example, the survey found that members of the public gave high marks for public safety and the quality of parks, trails and open space. The research effort also revealed that there is plenty of room for improvement, especially in the area of modernizing outdated systems.

The smart city paradigm is not a substitute or replacement for any of the guiding principles or strategies to which the City is already committed, such as the City's environmental sustainability strategies and economic development programs. Rather, the smart city paradigm supports and enhances those existing approaches.

As with any endeavor by a city government, two of the most critical questions here are "How much does it cost?" and "How do we pay for it?" Depending on the initiative, some funding may come from government or private grants. Some funding may coincide with funding available via Measure P (2016). Some individual projects or programs not specifically discussed here could fund themselves, such as digital wi-fi kiosks that provide space for high-quality display advertising. Some funding may be re-allocated from other areas as a result of increasing efficiency. Some funding will be available from growing tax revenue due to accelerated economic development.

This strategy is designed to be adaptable to the resources available to the City, as they are likely to fluctuate. This plan is also intended to be a living document that should be updated by staff periodically as circumstances and goals change. The evolution of technology and the emergence of best practices from other communities will influence the direction of Chula Vista's smart city strategy going forward. Some of the initiatives may become more important while others become less so. City staff will continue to engage the community to track progress and refine the strategy.

BACKGROUND AND CONTEXT

The City of Chula Vista has a proud history of civic innovation and leadership. The City is widely recognized for its early contribution climate change response; the City became a charter member of the International Council for Local Environmental Initiatives (ICLEI) in the early 1990s, completed a greenhouse gas inventory in 1996 and formally adopted its first CO_2 reduction plan in 2000, making it the first city in San Diego County to adopt a climate action plan. This legacy of leadership continued with early action on developing transit-oriented neighborhoods, the historic environmental and energy agreements related to the Chula Vista Bayfront, and the purchase and designation of land for a University and Innovation District, among others. Leadership within City staff has also operated for many years around a philosophy of continuous improvement — constantly working to become a better, more nimble, more flexible municipal government. The development of this smart city strategy is the latest development in this series of achievements.

Like all municipal governments, Chula Vista faces real challenges that complicate the path to realizing the smart city vision. The most significant of these challenges has its roots in the global financial crisis of 2007 – 2008. That crisis put severe strain on the City's revenues, resulting in significant reductions in staffing and resources available for critical infrastructure needs, including communications networks and devices. The economy has since improved, but revenues have not returned to their previous levels. The City also faces new challenges with the rising cost of healthcare and retirement contributions for current and retired employees.

The City has adapted to these financial realities, finding a variety of innovative ways to more efficiently and effectively meet the needs of residents and businesses. A significant share of the efficiency gains the City has realized over the past five to 10 years have been directly attributable to the adoption of new technological tools; City leaders have embraced emerging smart city approaches to everything from finance and accounting to tracking assets in the Public Works Department.

The City's ingenuity has earned it a reputation as a city that is more nimble, more flexible and more effective than cities of comparable or larger size. One benefit of this adaptive flexibility is that the City has been able to embrace and adopt smart city solutions more readily than most, attracting welcome attention from industry groups and nonprofit organizations dedicated to advancing technological innovation in municipal government.

The need for a cohesive smart city vision became more clear after the finalization of the Chula Vista Bayfront Master Plan and the subsequent Smart Bayfront assessment reports, which evaluated what technologies might be viable to help meet the unprecedented energy reduction targets established in the Master Settlement Agreement. As the largest currently fully entitled waterfront development site on the West Coast, the Bayfront presents a unique, once-in-a-lifetime opportunity to incorporate a comprehensive smart city infrastructure to not only meet environmental goals but to improve public safety, attract business, and generally improve the experience of Bayfront



residents, visitors and workers. The Bayfront also has the potential to serve as a test bed for smart city technologies, a place from which smart systems or programs can be scaled up to other parts of the City.

The Bayfront is just one of several major areas of smart city opportunity. Unlike most cities in San Diego County, Chula Vista has a significant amount of "greenfield," or undeveloped land that will be built out over the next two decades. Whether at Millennia, the University and Innovation District, or other developing neighborhoods, the advantage is in the potential to incorporate smart city infrastructure from the ground up. It is easier and less expensive to incorporate new technology and infrastructure into design and construction standards for new development than it is to retrofit older neighborhoods with the same. The amount of developable land in Chula Vista gives the City a significant advantage over other cities with regard to attracting investment in services such as fiber-to-the-premises internet, such as Google Fiber, or from autonomous vehicle research companies that can advise on technical elements that should be incorporated into new mobility infrastructure to accommodate emerging autonomous vehicle technology.

City leaders recognize, however, that cutting-edge advancements in new developments have the potential to exacerbate existing inequality, especially in older neighborhoods that are served by inferior infrastructure and whose residents are less likely to have access to technology. Thus, any smart city strategy for Chula Vista must address the so-called "digital divide" by identifying ways to bridge that gap and ensure that all residents and communities are served.

Given all the aforementioned considerations, the City engaged Madaffer Enterprises to develop a comprehensive strategic action plan that could tie together and prioritize all the various initiatives underway, correlate them to overarching goals, define the desired outcomes and highlight the public benefits of various actions. This document is the result.

PUBLIC OPINION

From the earliest stages of developing this strategy, City staff has recognized that incorporating and responding to public opinion would be essential to smart city success.

The City already had a good sense of public opinion before the development of this strategy began as a result of multiple scientific surveys of public opinion that have been conducted in the past five years. While these surveys were not specifically designed to test support for smart city concepts, many of the questions relate to key smart city issues, and the survey results as a whole provide a significant amount of valuable insight into how residents view the City's strengths and weaknesses.

To deepen the City's understanding of public opinion on smart city concepts, Madaffer Enterprises organized and advertised an online opinion survey with specific smart city questions. Paid advertising on Facebook and Instagram helped the survey reach Chula Vista residents in both



English and Spanish. The survey was sent to multiple email lists within and outside the City, and survey responses were also collected in person at the South Bay Earth Day festival. While the results may be less accurate than a randomized live telephone survey with 1,000 responses or more, this survey was a useful indicator of how the public felt about specific smart city ideas.

In addition to reviewing past survey results and conducting a new survey, Madaffer Enterprises also organized a small focus group of public opinion leaders and influencers to generate in-depth discussion of some of the issues surrounding smart city initiatives. This group included representatives of local community colleges, local philanthropic organizations, local civic groups, and local business associations. One of the strongest messages that came out of this session was the concern that the City not get distracted by technology for technology's sake and lose sight of its most important challenges.

The focus group pointed out that without adequate funding for core city services, adopting new technology could be a superficial measure that does not actually improve quality of life. For example, no matter how easy or convenient it is to use the ACT Chula Vista app to report graffiti, the outcome has not improved if it still takes two weeks and multiple complaints for someone to respond. As a result of this feedback, we have highlighted and emphasized in this report that community engagement is key, and that smart city initiatives must be tied to outcomes.

As the City gets further along the smart city path, and if funds become available, it may be helpful to commission a professional public opinion survey to guide the ongoing implementation of the smart city strategy and initiatives. A randomized, live telephone poll can provide highly accurate data on specific questions. Even without a poll dedicated to smart city issues, the City can include relevant smart city questions on future surveys, as recommended in this report. There are other less expensive but still valuable opportunities to test public opinion, such as custom polls on Facebook and on the City's website.

Polls and surveys are just one of many ways of gauging public opinion. The City also collects a substantial amount of feedback through in-person contact at customer service counters, e-mails and phone calls to City staff, and comments made during committee meetings and City Council meetings. Furthermore, the five elected City Councilmembers each have strong relationships with a diverse and representative array of residents and business leaders. It is important that this feedback is shared across departments with staff leading smart city initiatives and incorporated into future decision-making.



GOAL 1:

CONNECTED CITY



GOAL 1: CONNECTED CITY

Objective 1.1: Build out a comprehensive municipal network connecting City sensors and facilities

1.1: Initiatives

- Adopt Traffic Signal Communications Master Plan.
- Adopt citywide Telecommunications Master Plan.
- Identify and prioritize Measure P projects that support critical communications infrastructure needs.

1.1: Background and Context

A robust and modern IT infrastructure is the bedrock foundation of all smart city initiatives. The lack of such infrastructure threatens not only the viability of innovative smart city initiatives, but also the credibility and trustworthiness of the City as an institution that can effectively meet the needs of its constituents.

Leaders across the City government agree that the existing IT infrastructure has hindered the deployment of some existing smart city initiatives and is inadequate to support future efforts that require a more advanced network. The shortcomings in the City's IT infrastructure have also prevented the City from maximizing productive staff time and resources. These problems are not specific to Chula Vista, of course; many governments and businesses face similar challenges. If the City can successfully overcome its existing IT challenges and develop a network truly worthy of a smart city, Chula Vista will be widely recognized as a leader among cities.

The Smart Bayfront assessment reports recommended that the future Bayfront IT network be integrated into the City's shared IT network. It also recommended that all of the City's IT needs be managed through a shared network rather than separate networks for separate purposes. This approach significantly reduces operations and maintenance costs and improves reliability and scalability.

For this reason, a strategic approach to modernizing the City's IT infrastructure is essential to ensure that the network accommodates all current and future needs. City leaders have already prioritized the development of a Telecommunications Master Plan, with funding allocated and an RFP issued in mid-2017. City staff's participation in Envision America helped identify some of the key elements included in the RFP, and the process of developing the master plan will likely reveal additional elements and concerns not yet considered. Ultimately, this process will result in a strategic telecommunications plan that meets the best practices identified by leading groups in the smart city space, such as those outlined by the Smart Cities Council:

- Governed by a cybersecurity and privacy framework that safeguards data, privacy and physical assets
- Adheres to open standards and open integration architectures that allow for interoperability
- Enables the reliable connectivity of sensors, controllers and other instruments

The Telecommunications Master Plan will incorporate and complement the recently completed Traffic Signal Communications Master Plan, which details the steps the City must take to upgrade and modernize its traffic signals so they can be remotely controlled and optimized through a traffic management center.

Developing and adopting a Telecommunications Master Plan is the first major milestone toward building a comprehensive municipal network. Once a master plan is adopted, it will be critical to allocate the funding necessary to begin implementing the upgrades. A sustained commitment supported by the other goals in this plan will improve the City's ability to achieve its goals within the telecommunications master plan.

To fund the redevelopment of City IT infrastructure, there will be opportunities to leverage Measure P funds and projects, both directly and indirectly. In some cases, the cost to include the installation of fiber conduit or other IT infrastructure in a street renovation project would be marginal. In other cases, such as upgrading police and fire

2016

Chula Vista voters approve Measure P to fund critical infrastructure improvements



communications systems, Measure P funds will be directly applicable. The Measure P Expenditure Plan currently designates an estimated $7 million for the traffic signal system and $7.8 million for the police CAD and Regional Communications System (RCS), for example, and some of these funds have already been allocated by the City Council.

There are also state and federal programs that may provide funding for specific components. For example, the Library recently secured improved internet service and rates through the E-Rate program and California Teleconnect Fund. Grant funds may be available, especially when the case can be made that the upgrades will improve outcomes in the community (e.g. improved transit service due to better signal synchronization and transit signal priority). Operational efficiencies may also be another source of funding; a master IT network architecture can reduce costs up to 25 percent, according to the Smart Cities Council.

Another strategy for funding and completing the City's municipal network is by leasing or trading access to City infrastructure. The City owns thousands of traffic signal poles, streetlight poles, public buildings, streets, sidewalks, stormwater routes, and other real estate assets that can be used to deploy networks of sensors and devices necessary for smart city applications.

Some of these assets are already being used for smart city purposes, while others have significant potential to be put to good use. The demand for small cell installations will continue to grow with the widespread development of 5G data networks, as will new demand for installation of sensors that support autonomous vehicles and other smart city applications. Additionally, the City may want to use these assets for its own future purposes, such as air pollution sensors, public wi-fi access points and parking management systems. It is essential that the City has a clear, shared, public understanding of the value of its infrastructure as well as policies that determine how that infrastructure can be used by City departments, public utilities and private companies. In some cases, there will be opportunities to provide discounted leases or permit fees to access City-owned vertical assets in exchange for City access to privately-owned conduit and fiber strands. City staff should monitor and re-evaluate their policies periodically as state law and regulation continue to evolve.

1.1: Performance Indicators

- Percentage of IT support tickets meeting service-level agreement thresholds
- Proportion of senior ITS staff time dedicated to proactive support
- Customer satisfaction ratings for IT support
- Percentage completion of key action steps in Telecommunications Master Plan
- Percentage completion of key action steps in Traffic Signal Communications Master Plan
- Number of completed or in-progress Measure P projects that support network needs

1.1: Outcomes

- City prepared for next generation of smart city applications
- Fewer network or application problems, resulting in increased staff productivity
- City network and data are secure from external threats
- Improved traffic flows and reduced congestion on City streets
- Improved traffic safety
- Reduced greenhouse gas emissions due to idling at signalized intersections

GOAL 1: CONNECTED CITY

Objective 1.2: Ensure universal internet and technology access for all communities

1.2: Initiatives

- Work with ISPs to promote affordable internet service plans for residents at all income levels.
- Work with ISPs to further develop fiber internet and other high-speed options.
- Fund and promote technology access and training opportunities through the library and through other city departments, programs and initiatives.

1.2: Background and Context

As more public services, business transactions, social activities, and other essential facets of daily life are conducted via the internet, the City must do what it can to ensure that disadvantaged residents and communities are not left behind.

Unlike some rural communities in the U.S. that do not have access to high-speed internet because the infrastructure does not exist, Chula Vista's development patterns have been dense enough to incentivize private internet service providers to build out high-speed internet infrastructure to every residential building in the City. Whether it is cable internet through Cox Communications, broadband internet through AT&T, or 4G LTE service through cellular telephone carriers, every residential property in the City has the technical capability to connect at least one form of internet service.

The fact that internet service is available to every property, however, does not mean that every resident can afford it, or that every resident has a device that allows them to use it, or that every resident has the technical knowledge or comfort level necessary to use it. (In a few cases, older residential buildings lack the modern networking needed to bring internet service from the street into individual units.) The City must recognize that not every resident uses the internet, and that these residents generally fall into three categories: those who cannot afford any internet service; those who are unaware that low-price plans exist for households that meet certain income criteria; and those who are not comfortable using the internet.

The City should consider tailoring its efforts specifically to each of these three groups. For example, the City should do more to promote the availability of free public internet access and internet-connected devices at libraries, as well as provide for training opportunities for those seeking to learn how to use technology. While the library provides an ideal environment for these kinds of educational offerings (the Qualcomm-sponsored Thinkabit Labs program is an excellent example), the City should not overlook ways to incorporate technology education in other departments, such as Recreation or Police. The Norman Park Senior Center, for example, currently offers one-on-one technology instruction on any smartphone or tablet device for seniors.

The City should also work with internet service providers (ISPs) such as Cox, AT&T and wireless carriers to raise awareness about discounted options available to residents who meet certain income criteria. Additionally, the City should work with ISPs to facilitate and promote the further development of fiber-optic and 4G/5G wireless internet service in more neighborhoods so that these ultra-high-speed services are available outside of newer, luxury residential developments. There are likely bureaucratic and regulatory obstacles to expanding this service to built-out areas; any steps the City takes to facilitate will result in a net benefit to the community.

1.2: Performance Indicators

- Percentage of households subscribing to internet service
- Percentage of households and business that have access to fiber-optic or other high-speed internet service
- Number and circulation of library devices per capita
- Number of hours of technology training available to the public

1.2: Outcomes

- All residents can access information and engage with the City using the internet.
- All residents and businesses have access to high-quality, high-bandwidth internet service.
- Residents who do not have internet-enabled devices to use at home have access to them elsewhere.

GOAL 1: CONNECTED CITY

Objective 1.3: Integrate smart city philosophy into policy documents

1.3: Initiatives

- Include Smart City commitments in the next General Plan amendment.
- Update street design standards to incorporate fiber-optic conduit.
- Adopt a one-dig policy to ensure smart communications infrastructure is incorporated in all street excavations.
- Adopt a citywide data management, privacy, transparency and sharing policy.
- Adopt the Smart City Strategic Action Plan.

1.3: Background and Context

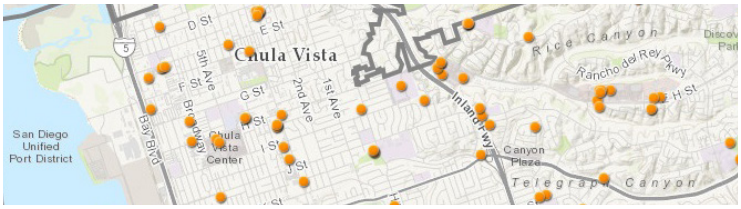
While City leaders have already made significant progress in communicating the smart city approach as a strategic priority among City staff, more should be done to document this commitment and ensure it is institutionalized as the way the City operates, regardless of staff turnover.

Incorporating smart city elements into written policy also serves as powerful evidence to external parties that the City is truly committed to a smart city approach. This is especially valuable in grant applications that call for a demonstrated commitment to smart city goals. It is also valuable in economic development dialogues in which businesses are considering making an investment within the City. When staff can point to concrete evidence, the City gains credibility.

Putting smart city language in the General Plan is one of the most effective ways to achieve this objective. Whether this would constitute its own amendment to the General Plan, or be folded into a future General Plan Update, should be determined by the City Manager. Along the same lines, the City Council can and should pass resolutions that commit the City to certain smart city initiatives. A recent example would be the resolution the Council passed in June 2017 regarding autonomous vehicle testing.

Beyond the overarching statements of values that may be added to the General Plan or in City Council Resolutions, there are specific policies the City can formalize to help advance other goals. For example, the Telecommunications Master Plan will identify a number of locations where fiber-optic conduit or cable is needed to build out the City's network. By adopting a policy to ensure that conduit is placed whenever a street is excavated for some other purpose, the City can meet its goals at only a negligible increase in cost. Similarly, including conduit and fiber-optic cable requirements in the street design standards will ensure the opportunity to expand the City's network capacity is never overlooked.

Open data and performance review policies will ensure that expectations with regard to data and analytics are clear to all parties. Data security and privacy are significant and growing concerns among the public. To build trust and confidence among the public, the City must recognize the risks and respond to them by developing a comprehensive policy that explains how data is used and how it is protected. Numerous leading industry groups, such as the Smart Cities Council and What Works Cities, have outlined some of the key elements that should be included in such a policy.



1.3: Performance Indicators

- Percentage of relevant City policy documents that have been updated to reflect smart city priorities

1.3: Outcomes

- Cost of developing smart communications infrastructure is reduced by sharing costs with other projects.
- All stakeholders understand where the smart city strategy fits within the context of the General Plan.
- City is better positioned to win future grants, private investments and research partnerships.
- Community is confident that City is collecting, storing and using data in a secure, responsible way.
- City limits its legal liability related to data and analytics.

GOAL 2:

RESPONSIVE CITY



GOAL 2: RESPONSIVE CITY

Objective 2.1: Foster vibrant community engagement

2.1: Initiatives

- Host community workshops, forums, and other outreach events to engage a diverse group of residents and stakeholders in the development of policies on smart city initiatives.
- Host City Council study sessions as appropriate to facilitate dialogue between elected officials and community members on smart city issues.
- Designate smart city champions within different city departments and provide appropriate media training.
- Include questions about smart city issues in city-commissioned public opinion research when possible.
- Incorporate a smart city communications plan into the City's existing marketing and communications strategy.
- Refine and promote ACT Chula Vista and NIXLE apps.

2.1: Background and Context

At its most fundamental level, every local government is designed to serve and support its local community. To effectively implement smart city initiatives, the City of Chula Vista must continuously tailor its activities around the community with simultaneous consideration for its current needs and future vision.

By engaging the community throughout the planning, implementation and review processes for smart city initiatives and programs, the City can address unanticipated concerns as soon as possible and engender goodwill and support from constituents. Community participation will also help City staff prioritize smart city projects and outcomes. Furthermore, most potential grant-makers require a demonstrated community engagement effort for grant consideration.

Ultimately, the smart city approach is people-centered. The smart city approach strives to deliver efficiencies, cost reductions, and quality of life improvements that will benefit all groups within the community. However, the "smart city" concept will likely raise complicated questions for public discussion; among them: ethical and legal issues, cybersecurity, data sharing, privacy, public trust. Addressing community questions throughout the transition to a new smart city paradigm will require a concentrated effort with carefully facilitated dialogue and cultural sensitivity.

Communicating with both Chula Vista residents and external audiences is essential to effective community engagement. The City has an existing marketing and communications strategic plan that was designed to incorporate smart city messaging within the existing framework, which should be used alongside this report to develop a comprehensive communications program for smart city initiatives. Due to the Chula Vista's diversity, the City should ensure it is both listening and communicating to all demographics of the city, offering opportunities to provide feedback in various languages throughout the City's neighborhoods. In order to ensure a diverse range of voices are included in engagement efforts, the City should offer a variety of in-person and online channels for people to engage and provide feedback.



Two ways the City is already incorporating two-way communication with residents are the ACT Chula Vista app and Nixle notifications. ACT Chula Vista, powered by See Click Fix, allows anyone in the community to report problems such as potholes, graffiti and broken streetlights to the City. The app has been an effective means of engagement, but there is room for improvement. Nixle is a tool that allows the City to communicate directly with the community using text message or email alerts. The City was actually first in the nation to pilot this technology with the software developer in 2008, and it has continued to refine its use. There are further opportunities to use Nixle as a way to inform users in targeted neighborhoods about heavy traffic, detours, closures, police activity and other urgent matters. There is also plenty of opportunity for the City to further market these apps and grow the number of community members reached.

2008

Chula Vista became first city in the nation to pilot Nixle public safety notification technology

The City's smart city community engagement effort should revolve around three central elements: stakeholder education; responsiveness to constituent concerns; and transparency.

Stakeholder education: Throughout its smart city planning, implementing and messaging, the City must demonstrate that it cares about engagement by regularly reaching out to the public and key stakeholders, such as neighborhood leaders, major employers, and civic groups. These actions will generate goodwill and proactively address any challenges that may arise. The effort could be kicked off with a City Council study session to facilitate dialogue between the council and the community about the smart city approach. As the City prepares to implement specific smart city initiatives, especially those in which privacy or security may be a concern, staff should proactively invite dialogue with the stakeholders most likely to have concerns and give them the opportunity to help shape policies up front.

Responsiveness to constituent concerns: Key City staff and designated smart city champions should be well informed and effectively trained in responding to the public. An adequate number of people should be designated to work with constituents who have questions in order to allow for fast response times.

Transparency: It is important to communicate regularly with the community about smart city progress in order to demonstrate transparency in government and strengthen public trust. Communication should be coordinated by appropriate Communications & Marketing staff and can be achieved through a number of channels, such as news releases, community updates through newsletters and social media, and in-person events. The City should offer a sign-up list for news about all the City's smart city efforts.

More detailed resources for marketing and communications are included as Appendix A to this report.

2.1: Performance Indicators

- Number of community engagement events
- Number of citizens, businesses and organizations participating in outreach events
- Number of media hits on smart city stories
- Traffic metrics to smart city pages on City website

2.1: Outcomes

- Smart city policy development is driven by involving local residents, stakeholders and experts.
- Problems and concerns regarding specific initiatives are addressed early in the process.
- Diverse audiences are being reached and included in the decision-making processes, including those who cannot attend regular City Council or commission meetings.
- External audiences recognize Chula Vista as a smart city.

GOAL 2: RESPONSIVE CITY

Objective 2.2: Strengthen intergovernmental relations

2.2: Initiatives

- Coordinate regional smart city working groups focused on identifying opportunities for interagency collaboration on smart city initiatives.
- Maintain smart city dialogue with local, state and federal agencies.
- Build and expand partnerships with academic and research institutions.

2.2: Background and Context

The City of Chula Vista is part of a vibrant binational mega-region, the second largest in the world, with $230 billion in gross domestic product, according to the San Diego Regional Chamber of Commerce. The Chula Vista community includes a number of local, state and federal government agencies that each have a role to play in the region's smart city strategy. Partnering and collaborating with these agencies improves the City's ability to implement smart city initiatives. Regional collaboration also provides opportunities for sharing best practices, presenting joint grant applications, and pursuing economic development opportunities.

Some of these agencies include: San Diego Regional Association of Governments (SANDAG), San Diego Unified Port District, Metropolitan Transit System, Sweetwater Authority, Otay Water District, Chula Vista Elementary School District, Sweetwater Union High School District, Southwestern Community College District, California Department of Transportation, and the U.S. Department of Transportation.

Since highways, streets and roads through the City come to and from other jurisdictions, it is important to recognize the role of neighbors as potential partners in a coordinated network infrastructure. Working closely with other government agencies, the City can work to maximize the efficient use of public resources and seek ways to share costs when installing and upgrading infrastructure. Additionally, since a significant portion of City assets share a physical connection with assets owned or controlled by neighboring agencies, a collaborative approach that includes data and knowledge sharing will facilitate needed permissions and approvals.

No city works in a silo, and the value of effective collaboration is recognized by grant-makers and investors. The City of Chula Vista has made positive strides in regional collaboration on its smart city efforts, including in its partnership with SANDAG and Caltrans to establish an autonomous vehicle proving grounds on local roads. The City's participation in Cleantech San Diego has also been valuable for facilitating connections with smart city-focused businesses, organizations and City leaders. Continuing these efforts will strengthen Chula Vista's appeal to organizations making grants and to businesses looking to invest in new cities.

In addition to working with relevant government agencies,







4,000+

Number of sixth-grade students visiting library's Innovation Station annually

10

Number of cities, including Chula Vista, selected for Envision America 2017

cultivating support for smart city strategies with government officials, both elected and appointed, who represent the City of Chula Vista at the local, state and federal levels will increase the City's ability to connect with others and provide essential endorsements from key leaders.

It is also important for the City to maintain strong relationships with utility companies, including San Diego Gas & Electric (SDG&E), Cox Communications, and AT&T. Hospitals and healthcare centers are another area of opportunity for collaboration.

The San Diego region has numerous world-renowned colleges, universities and research institutes, with which the City should continue building relationships. Academic and research institutions have exceptional access to grant funding for research, and many funding opportunities require proposed research to address a public need. A partnership with the City can provide that. Furthermore, it is well known that startups often spin off from research that begins at universities and research institutes. Existing partnerships with the City will improve the likelihood that such spinoffs provide employment benefits to Chula Vista residents.

2.2: Performance indicators

- Number of projects and initiatives based on an interagency partnership
- Number of state and federal grants and overall funding totals
- Number of projects and initiatives with academic partners

2.2: Outcomes

- Increasing public benefit at minimal additional cost due to partnerships on projects and initiatives that would otherwise not be feasible.
- City spends less on capital improvements, operations and maintenance on projects that can be shared with other agencies.
- City is positioned to take advantage of state and federal grant funding opportunities.
- Improved quality of life and improved government efficiency resulting from findings of academic research.
- Economic growth as a result of companies spinning off of partner academic institutions.

GOAL 2: RESPONSIVE CITY

Objective 2.3: Lay the groundwork for economic development opportunities

2.3: Initiatives

- Engage with local businesses and organizations to identify smart city business priorities.
- Prioritize engagement with technology-related industries likely to do business in Chula Vista.
- Participate in peer learning and networking opportunities that promote business growth.

2.3: Background and Context

The lack of high-paying jobs in Chula Vista is widely understood to be one of the City's biggest economic challenges. The City has a strong base of skilled and educated workers, but overwhelming numbers of Chula Vista residents commute long distances to high-tech job clusters in the northern neighborhoods of the City of San Diego. This strains transportation networks and reduces the time residents have available to spend with their families or engage in civic and community activities.

Despite this challenge, Chula Vista has many reasons to be optimistic. Major development opportunities exist at Millenia, the Bayfront, and the University Park & Innovation District, with hundreds of acres and millions of square feet of commercial space slated for development. In fact, Chula Vista has more developable land than any other city in San Diego County**.** These sites are already attracting significant interest from various sectors, including clean technology; information and communication technology; health, wellness, and sports medicine; education and innovation; and headquarters and administration. The smart city strategy can appeal to all of those sectors.

The relative lack of existing development at Millenia, the Innovation District and the Bayfront all present opportunities to build new smart city infrastructure that is more difficult to retrofit into existing, built-out neighborhoods. Examples include fiber-optic internet, vehicle-to-infrastructure communications systems, microgrid and distributed energy systems. These sites can also be used for interim business purposes, such as the testing and deployment of aerial drones and autonomous vehicles.

The smart city brand itself is a way to invite economic development. A city that can demonstrate the day-to-day benefits of technology is better positioned to attract business growth. Public safety is one example: Smart city solutions may help the City reduce crime rates and emergency response times, making it easier to do business. Similarly, modern traffic signals that reduce congestion on City streets can contribute to higher levels of happiness among employees, or reduce the amount of retail sales lost to businesses in neighboring cities.

There is also significant demand among startups and large technology companies for city data that can be used to deliver private services. The City can develop policies and programs that allow private entities to create applications with public benefits. Examples could include smart parking apps, apps that allow citizens to track City expenditures on budget items and integrating traffic management data into existing navigation apps like Google Maps or Waze.

In recent years, City staff have become more engaged in local, national and international peer learning and networking groups and events. Examples include the South County Economic Development Council, San Diego Regional Economic Development Corporation, Cleantech San Diego, the Global Cities Team Challenge, Envision America, Smart Cities Week, and Smart Cities Connect. These events and programs have yielded valuable relationship-building opportunities for the City, educational opportunities, and heightened visibility for the City among companies doing business in the smart city space. Staff will continue to build these relationships and work to leverage for economic development purposes.

2.3: Performance Indicators

- Local employment metrics
- Business license data

2.3: Outcomes

- City programs and initiatives are responsive to the needs of local businesses.
- City programs and initiatives are designed to appeal to targeted business sectors.
- The number of high-paying local jobs increases.

GOAL 3:

TRANSPARENT CITY



GOAL 3: TRANSPARENT CITY

Objective 3.1: Use data and analytics to improve City services and broaden public access to information about City performance

3.1: Initiatives

- Use the What Works Cities Standard as a roadmap for open, data-driven government.
- Identify and digitize key data sets held by City departments.
- Complete the Public Works asset management database.
- Develop the technical structure necessary to enable third-party apps using City data.
- Assemble City performance indicators in an accessible online portal.
- Designate data and analytics stewards in City departments as appropriate.

3.1: Background and Context

Emerging data analytics tools are giving cities new ways to assess their performance and make changes to improve efficiency. The City of Chula Vista has already made significant strides in this area. The Finance Department's new enterprise resource planning (ERP) system enables the City to automate the collection and analysis of financial data, which will be used to improve financial and operational decision-making across departments. The Public Works Department's asset management system captures information about the current status of City infrastructure, such as roads, and helps the City predict how soon certain infrastructure may need to be repaired or replaced. The Police Department has also transitioned to a new CAD system that provides law enforcement personnel with advanced data and analytics capabilities.

While the City has made strides in improving its data collection and analysis capabilities, these systems are still isolated from one another, and there is no single repository of collected data that can be seamlessly accessed by multiple departments. This should be addressed in the telecommunications master plan as it is developed.

Among the various best practices the City could use to guide its data and analytics efforts, one that stands out is What Works Cities, a nonprofit initiative aimed at honing best practices for mid-sized cities. The What Works Cities Standard is an extensive and detailed list of concrete steps cities can take to create a strong foundation for the effective use of data and evidence. These standards serve as an excellent roadmap for Chula Vista.

In addition to tracking assets and improving program performance, the City can also use data and analytics to improve community engagement and trust by increasing transparency about what the City is doing and how public money is spent. An emerging trend in the smart city space is the development of real-time online dashboards that make it easy for residents to take a look "under the hood" of the city. There are many ways these types of dashboards can be used; a common example is a dashboard that shows real-time energy use in certain city facilities. Chula Vista's dashboard does not have to be comprehensive to begin with; it can start with one or two indicators and grow as more data becomes available.

Beyond simple transparency, the City can also pursue economic development opportunities with the valuable data it collects, as described in Objective 2.3. To facilitate this activity, the City can identify which data sets are most valuable to external parties and ensure those data sets are digitized in an accessible format. Data stewards in key departments should be responsible for ensuring the data is managed and shared appropriately according to policies, as described in Objective 1.3.

3.1: Performance Indicators

- Number and variety of City performance indicators available for review through a central public portal on the City's website
- Number and variety of data sets available for external developers to use in creating analytical tools and services

3.1: Outcomes

- City realizes the full value of the systems and data under its control.
- Efficiency of City employees and systems is maximized.
- Costs of infrastructure maintenance and repair are minimized.
- Economic growth is encouraged.

GOAL 4:

INNOVATIVE CITY



GOAL 4: INNOVATIVE CITY

Objective 4.1: Position the Bayfront as a model smart neighborhood

4.1: Initiatives

- Work with development partners and project stakeholders to follow through on the next steps recommended in the Smart Bayfront assessment reports.
- Assemble case studies of smart city applications at the Bayfront to aid similar projects in other neighborhoods.

4.1: Background and Context

The Bayfront is one of the most significant long-term projects underway in Chula Vista, and its role in the smart city strategy is key. Not only will the Bayfront serve as an economic development engine for the region, it will also serve as a demonstration and test bed for the smart city development approach. Applications and initiatives deployed at the Bayfront will eventually be scaled up and replicated in other neighborhoods.

Working with engineering consultants and experts from Black & Veatch, the City in 2016 completed the Smart Bayfront assessment reports, which analyzed the various energy technology options the City could use to achieve the ambitious energy efficiency goals required by the Bayfront Settlement Agreement. The report also analyzed the communications infrastructure and key building blocks that would be needed to make the Bayfront a model smart neighborhood. These reports offered a number of next steps and recommended actions to clarify the City's path forward. It is critical that the City keep these assessments and their recommended next steps front and center as it continues the process of planning and developing the Bayfront.

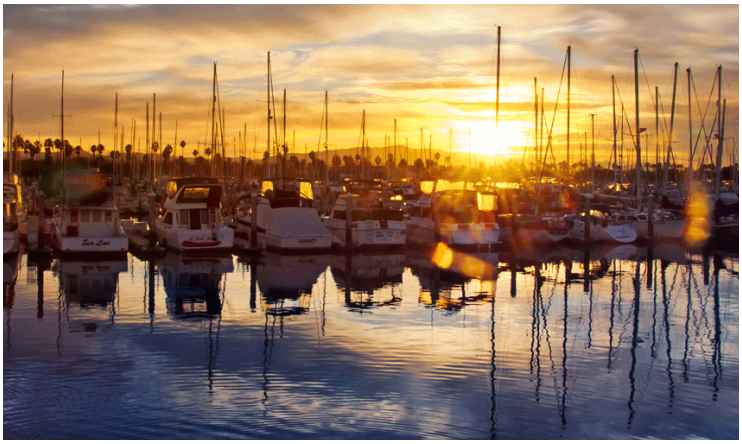
Unlike many of the other initiatives in this plan, activity at the Bayfront will span decades. In some ways, this creates a unique challenge, because it is difficult to predict how technological needs will change over that period. On the other hand, the long time-horizon is really an opportunity to grow and evolve in tandem with technological change. The Bayfront will be a living laboratory for the smart city approach.

Largest

Fully entitled waterfront development opportunity on the West Coast

50%

Less energy used by Bayfront buildings compared to state standards



4.1: Performance Indicators

- Percentage completion of Bayfront project milestones
- Energy usage per Bayfront building compared to Settlement Agreement requirements
- Number of smart city applications incorporated into Bayfront developments

4.1: Outcomes

- Tourism and convention business at the Bayfront drives local economic growth.
- Quality of life improves for those living and working at or near the Bayfront.
- City has a scalable example of deployed smart city applications.

GOAL 4: INNOVATIVE CITY

Objective 4.2: Advance environmental sustainability goals

4.2: Initiatives
- Identify and capitalize on opportunities for sensors, data and analytical tools to support environmental sustainability strategies.
- Install smart controls wherever feasible to improve sustainability outcomes.

4.2: Background and Context

The City has a strong record of strategic action on environmental sustainability that dates back to the 1990s and continues today with an active Climate Action Plan and a well-staffed Office of Sustainability. These environmental sustainability efforts are driven by strong community and political support and will grow in both reach and importance as the climate and environment continue to change.

In many ways, Chula Vista's smart city goals and sustainability goals are complementary, and there are many opportunities to leverage one or the other to produce greater overall results. For example, efficiencies yielded by smart sensors or controllers may free up resources to be devoted to other sustainability initiatives that are less cost-effective. Changes to make the City's vehicle fleet more environmentally sustainable will have positive effects not only for the environment, but also in creating opportunities for data-driven management and performance improvements.

The City is preparing to adopt an updated version of its Climate Action Plan, which aims to reduce per capita greehouse gas emissions by focusing on energy and water efficiency in buildings; smart growth; clean transit; increasing local energy generation and water resources; leading by example; and community resilience. In addition to its Climate Action Plan, the City has several other strategic plans that complement its smart city goals.

In 2014, the City developed its first City Operations Sustainability Plan, a strategic framework for ensuring the City leads by example in the areas of energy, water, purchasing, waste management, pollution prevention, transportation, and green buildings and infrastructure. The City Operations Sustainability Plan includes a number of actions that complement the smart city paradigm.

In 2016, the City Council approved the Water Stewardship Plan, a strategic framework for enhancing water efficiency and water reuse throughout the City. The Water Stewardship Plan includes a number of actions that complement the smart city paradigm, noting in one section that "you can't manage what you can't measure."

A growing number of smart controls and devices give the City new ways to track progress and achieve these goals. Among the most promising examples are smart irrigation controllers, remote management of building systems, leak detection sensors, air pollution monitoring devices, and energy management tools. The spread of smart energy meters and water meters could also help the City work with residents to reduce wasteful energy and water use.

2000

Chula Vista becomes first city in county to adopt a CO_2 reduction plan

4.2: Performance Indicators
- Energy and water usage metrics at City facilities
- Carbon-equivalent emissions from City operations
- Energy and water usage metrics by local residents and businesses
- Carbon-equivalent emissions from local residents and businesses

4.2: Outcomes
- Reduction in energy and water costs at City facilities
- Improved air quality in the City
- Regional and global leadership in climate change prevention, adaptation and resilience

GOAL 4: INNOVATIVE CITY

Objective 4.3: Enhance public safety and traffic safety capabilities

4.3: Initiatives

- Develop the autonomous vehicle safety testing program.
- Modernize the CAD system.
- Transition to mobile devices for police officers.
- Develop unmanned aerial vehicle capacity.
- Outfit the emergency operations center.
- Provide the IT and network support necessary to accommodate evolving police and fire needs.

4.3: Background and Context

The smart city space in recent years has been dominated by transportation and telecommunications solutions, but cities are increasingly looking to technology and data analytics to improve public safety outcomes. The City of Chula Vista has recognized that public safety is one of the areas where smart city solutions can make the most significant impact, not just in quality of life for residents but also in strengthening the City's appeal to businesses.

The police and fire departments have long been among the most technology-driven departments in the City, with radio communications, computer-aided dispatch (CAD), GPS tracking, traffic signal pre-emption technology, and statistical analysis serving critical purposes. A new generation of technology is improving these tools and introducing new ones that enable public safety departments to get closer to achieving full situational awareness and maximizing the efficient use of resources.

The new CAD system in the Police Department is one of the most notable examples. First put into service in July 2017, the new CAD allows real-time tracking of all patrol vehicles and their associated active and pending calls for service on a map. Among its many features, this system can recommend which resources should be dispatched to a call based on the status, proximity and capabilities of units on duty. Fully incorporating all the features of the CAD system into police operations will be an important ongoing process.

#10

Chula Vista's rank among the safest U.S. cities with population over 200,000

One of the most effective ways to extend the capabilities of the CAD system is to provide a network of smartphones assigned to sworn officers. In addition to assisting with location tracking when an officer is outside the vehicle, these devices also enable functions such as facial recognition, digital evidence capture, report writing, and integration with cloud collaboration tools. These features extend the capabilities of officers and have the potential to reduce the amount of time officers spend on administrative tasks, thereby making more time available for proactive policing. Obtaining these devices and incorporating them into police operations is a key step toward enhancing public safety capabilities.

Another technology on the priority list in the police department is the use of unmanned aerial vehicles (UAV) for investigative purposes. Small UAVs can provide critical information in emergency situations and are much less expensive to operate than traditional helicopters. They may also have a role in search-and-rescue operations in difficult-to-access terrain.

Building an operations center that brings together all relevant information sources is another top priority for the police and fire departments. Currently, various information sources and communication stations are spread throughout multiple locations.

Network and data security is an issue of concern for all police and fire technology. This is typically addressed by using an entirely separate network, or secure cloud storage solutions. The Telecommunications Master Plan should detail how the City will accommodate these network security needs. It is also critical that the citywide data privacy policy in Objective 1.3 specifically addresses public safety data.

Policing is an area where the City should exercise



heightened sensitivity and conduct additional public outreach when it comes to new technologies, such as automated license plate readers or facial recognition tools, which may be a source of concern for some members of the community. State law in this area continues to evolve with requirements for policies on privacy, data retention, etc. In keeping with the community engagement objectives of this strategy, it is critical that the City work directly with residents and advocacy groups to address privacy and security concerns and develop appropriate policies early, before the technology is widely implemented. Without this outreach and mutual engagement, the City faces the risk of a negative reaction. With the right balance of technological innovation and community engagement in public safety technology, the City can further establish itself as a national leader if it strikes the right balance that effectively meets the needs of the community.

Smart city initiatives in the police and fire department have a number of viable funding options. Chula Vista voters approved the Measure P sales tax increase with the expectation that a significant portion of the added revenue would pay for upgrades to outdated police, fire and 9-1-1 emergency response facilities, vehicles and equipment. A significant amount of federal and state grant funding is also available annually from multiple sources, and both the Police and Fire departments have proven adept at securing grant funding for operations and innovation.

Public safety goes beyond the police and fire departments, however, with Chula Vista's recent designation by the U.S. Department of Transportation as one of 10 autonomous vehicle proving grounds. The autonomous vehicle proving grounds — a partnership between the City, the San Diego Association of Governments (SANDAG) and the California Department of Transportation (Caltrans) — include both State Route 125 through Chula Vista as well as surface streets within the City limits, along with the Interstate 15 Express Lanes.

Chula Vista's participation in autonomous vehicle testing has the potential to be a life-saving effort. In 2014, more than 32,000 people died in the U.S. as a result of vehicle crashes, according to the National Highway Traffic Safety Administration. The overwhelming majority of these crashes were caused by human error. Within the next 10 - 20 years, fully autonomous vehicles will be able to safely and reliably operate without the involvement of error-prone humans.

There are a number of detailed steps the City must take, in collaboration with its partners, to fully realize the value of the proving grounds designation; the designation came with no funding. This includes extensive public outreach, media relations, building relationships with companies engaged in autonomous vehicle research, technical engineering, grant-seeking, developing and refining safety rules, determining data-sharing policies, and others. These tasks will be led by the City's Engineering team. The payback on this investment of time and resources will likely be significant economic development, as well as safer roads.

4.3: Performance Indicators

- Rate of unsolved crimes
- Emergency response times
- Crime rates per capita

4.3: Outcomes

- The City's crime rate will continue to decline.
- The City will be resilient in the face of man-made and natural disasters.
- The City's economy will grow faster due to safer streets and neighborhoods.
- Fewer residents and visitors will be injured or killed in vehicle crashes.

CONCLUSION:

LOOKING FORWARD



LOOKING FORWARD: UPDATES AND TRACKING

Updates

The Smart City Strategic Action Plan is intended to serve as a reference, a resource, and a guide for City staff, but it is not an exhaustive list of everything the City can or should do to achieve the smart city vision. Technology is evolving rapidly, and cities all over the world are still developing best practices for how to implement emerging technologies in a way that best meets the specific requirements of municipal government. This plan should be considered a living document that can and should change as knowledge, technology, resources and other conditions change.

Smart City Working Group

Because so many smart city initiatives overlap with the responsibilities of different city departments, interdepartmental teamwork, knowledge-sharing and decision-making will be essential to success. City staff have already organized an internal working group dedicated to breaking down silos and sharing information and resources between departments. This group meets monthly and includes the City Manager, Assistant City Manager, Deputy City Manager, staff from the Police and Fire Departments, several department heads, and the Chief Sustainability Officer, who coordinates the group.

Public Engagement

Enhancing community engagement is one of the key objectives of this plan, and while communication, conversation and engagement with stakeholders are important ends in themselves, community engagement is also necessary to refine and guide the future implementation of this plan. Many of the best ideas for how to solve specific smart city problems will come directly from residents, businesses, visitors, and other agencies. These stakeholders may also point out issues or concerns that need additional attention from City staff. Therefore, City staff will work regularly to promote and encourage dialogue about the smart city strategy.

Progress reports

This plan identifies numerous concrete action steps and performance indicators, but these only matter if they are used as benchmarks against which the City measures its progress. City staff should produce an annual report on actions completed to date, performance indicator data, stakeholder feedback, and recommended changes to the strategy going forward.

CAPTIONS AND CREDITS

Captions:
Page 5: A newer suburban neighborhood in Chula Vista
Page 6: Chula Vista City Hall
Page 7: Lower Otay Reservoir
Page 8: An MTS bus traveling through Chula Vista's Third Avenue Village
Page 10: An example of IT network hardware
Page 12: A map of cell phone tower permits in Chula Vista
Page 13: A San Diego State Student works in the Zahn Innovation Center (Courtesy of San Diego State University)
Page 14: A child tries on tactical gear at a Chula Vista Police Department event
Page 16: (Left) The Chula Vista team at Envision America 2017; (Right) The Chula Vista team at Smart Cities Connect in 2016
Page 17: A lesson at the Innovation Station at the Chula Vista Library
Page 19: A bird's-eye view of the Chula Vista City Hall complex
Page 21: A rendering of a proposed hotel at the Chula Vista Bayfront (Courtesy of RIDA Development)
Page 22: Boats at the Chula Vista Marina
Page 25: An example of electric vehicle charging
Page 26: City Council Chambers at Chula Vista City Hall

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