

IBM's Smarter Cities Challenge

# Reno

Report









# Contents

<b>3</b>	<b>1. Executive summary</b>
<b>5</b>	<b>2. Introduction</b>
5	A. The Smarter Cities Challenge
6	B. The challenge
<b>7</b>	<b>3. Context for recommendations</b>
7	A. Findings and context
9	B. Roadmap of recommendations
<b>13</b>	<b>4. Recommendations</b>
13	A. Recommendation 1: Change your mindset
18	B. Recommendation 2: Be one strong voice
20	C. Recommendation 3: Harness the data
31	D. Recommendation 4: Brand the vision, not the slogan
34	E. Recommendation 5: Invest in your people
<b>39</b>	<b>5. Conclusion</b>
<b>41</b>	<b>6. Appendix</b>
41	A. Acknowledgements
45	B. Team biographies
49	C. References
51	D. Data directory
53	E. City of Reno organization
54	F. City Manager organization

# 1. Executive summary

**In 2012 IBM selected Reno in Nevada, USA, as one of 33 cities to receive a Smarter Cities Challenge® grant as part of IBM's citizenship efforts to build a Smarter Planet™.**

Mayor of Reno, Robert Cashell, Sr. and his senior leadership team challenged IBM to: *“Help craft a data-driven strategy for economic development as the City looks to diversify its economy. By applying advanced analytics and using open data, the City aims to improve coordination among policymakers, citizens, higher education institutions, businesses and investors.”*

In response to this challenge, in February 2013, a team of five global IBM experts worked together to provide recommendations for the region.

## The challenge

In the face of the recent economic downturn, the City of Reno and its regional partners recognize the need for cohesive, forward-looking economic development. They applied for an IBM grant in order to gain an outside-in perspective on the region's many challenges.

These challenges impede forward movement. They include:

- Many different sources of data, each with its own rules and definitions
- Lack of integrated data
- No cohesive regional identity and vision
- Lack of collaboration across different parties, policymakers, citizens, higher education institutions, businesses and investors
- Limited fact-based regional decision-making

The global IBM interdisciplinary team brought deep expertise across a diverse set of disciplines, which helped them to think about the challenges in new and innovative ways. This alternative perspective enabled the team to work with the many different regional constituents and gain the buy-in and momentum required to address the challenges.

## Findings and recommendations

For three weeks the IBM Smarter Cities Challenge team worked together to understand the issues, assess the options, then deliver recommendations and a roadmap to the region. They conducted more than 50 interviews with more than 110 stakeholders who represented public, private and education sectors. Combining interview insights with their assessment of economic development assets and best practices, the team developed a number of findings about the current situation:

- Individual entities work in silos instead of together as a unified region.
- Multiple economic development agencies and authorities represent different parts of the region, resulting in fragmented economic development.
- The region uses multiple different record systems and data sources, formats, purposes and definitions.
- There is no regionally cohesive data set for insights and decision-making.
- The existence of different visions and objectives among the various agencies dilutes the message.
- Each jurisdiction has its own brand with its own slogan; there is no unifying regional vision and brand.
- The state falls to the bottom at a national level for education and graduation rates.
- The region continues to struggle with investment in education, specifically K-12.
- Businesses considering relocation and investment in the region often cite the lack of a qualified workforce as a barrier.

After looking at the findings and considering the overarching objective, the team developed five recommendations to establish a framework for regional economic development. The recommendations work together, each building on the success of the others.

1. **Change your mindset:** Develop an integrated regional economic development strategy.
2. **Be one strong voice:** Present one regional economic development face to the outside world.
3. **Harness your data:** Build a regional “system of systems” analytics utility to support economic development.
4. **Brand the vision, not the slogan:** Present a single strong identity for the city and the region as a whole.
5. **Invest in your people:** Focus on education and workforce development to build a foundation for future growth.

The team completed its recommendations with a 12-month roadmap for immediate action and a governance structure to kick-start economic development in the region.

## Conclusion

The region will achieve sustainable economic development through a commitment to collaboration and business-friendly practices. It should leverage its location as a supply chain hub, dedicated workforce, and academic and natural assets. The region should engage its constituents in order to gain buy-in for a regional vision, identity and brand. A system of systems and strong governance model will empower the region to make fact-based decisions that will improve public services and attract, retain and grow business. This will help to move the region forward on its journey toward revitalization.

- A system of systems will enable the region to make fact-based, timely decisions to improve citizen services and its ability to grow, retain and attract new business.
- The region has a groundswell of support for a new regional vision, identity and cooperative mindset.
- For long-term economic sustainability, the region should invest in education and workforce development to prepare today's citizens for tomorrow's jobs.
- Strong governance and informed decision-making, combined with robust communications and measurement, will spur long-term economic growth.

# 2. Introduction

## A. The Smarter Cities Challenge

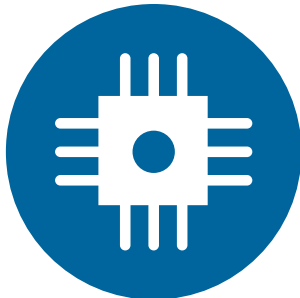
**By 2050, cities will be home to more than two-thirds of the world's population. They already wield more economic power and have access to more advanced technological capabilities than ever before. Simultaneously, cities are struggling with a wide range of challenges and threats to sustainability in their core support and governance systems, including transport, water, energy, communications, healthcare and social services.**

Meanwhile, trillions of digital devices, connected through the Internet, are producing a vast ocean of data. All this information – from the flow of markets to the pulse of societies – can be turned into knowledge because we now have the computational power and advanced analytics to make sense of it. With this knowledge, cities could reduce costs, cut waste, and improve efficiency, productivity and quality of life for their citizens. In the face of the mammoth challenges of economic crisis and increased demand for services, ample opportunities still exist for the development of innovative solutions.

In November 2008, IBM initiated a discussion on how the planet is becoming “smarter.” By this, it meant that intelligence is becoming infused into the systems and processes that make the world work – into things no one would recognize as computers: cars, appliances, roadways, power grids, clothes, even natural systems such as agriculture and waterways. By creating more instrumented, interconnected and intelligent systems, citizens and policymakers can harvest new trends and insights from data, providing the basis for more informed decisions.

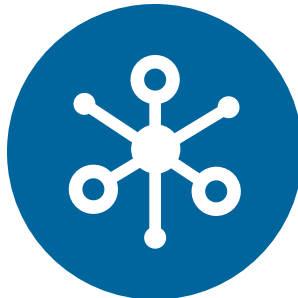
A Smarter City uses technology to transform its core systems and optimize finite resources. Since cities grapple on a daily basis with the interaction of water, transportation, energy, public safety and many other systems, IBM is committed to a vision of Smarter Cities® as a vital component of building a Smarter Planet. At the highest levels of maturity, a Smarter City is a knowledge-based system that provides real-time insights to stakeholders and enables decision-makers to manage the city's subsystems proactively. Effective information management is at the heart of this capability, and integration and analytics are the key enablers.

Intelligence is being infused into the way the world works.



### Instrumented

We can measure, sense and see the condition of practically everything.



### Interconnected

People, systems and objects can communicate and interact with each other in entirely new ways.



### Intelligent

We can analyze and derive insight from large and diverse sources of information, to predict and respond better to change.

As IBM aligns its citizenship efforts with the goal of building a Smarter Planet, city leaders around the world face increasing economic and societal pressures. Given the increased demand for services, they have to deliver new solutions ever more rapidly.

With this in mind, IBM Corporate Citizenship has launched the Smarter Cities Challenge to help 100 cities around the world over a three-year period become smarter through grants of IBM talent. Reno, Nevada, USA, was selected through a competitive process as one of 33 cities to be awarded a Smarter Cities Challenge grant in 2013.

During a three-week period in February 2013, a team of five IBM experts (referred to in this report as “the Smarter Cities Challenge team”) worked in the region to deliver recommendations around key issues for Robert Cashell, Sr. Mayor, City of Reno.

“The region” referred to throughout this report includes the City of Reno, the City of Sparks and Greater Washoe County. The Smarter Cities Challenge team’s recommendations apply to the whole region and require everyone’s support.

## B. The challenge

In the face of the recent economic downturn, the City of Reno and its regional partners recognize the need for cohesive, forward-looking economic development. They applied for an IBM grant in order to gain an outside-in perspective on the many challenges that hold the city back.

These challenges include:

- Many different sources of data, each with its own rules and definitions
- Lack of integrated data
- No cohesive regional identity and vision
- Lack of collaboration across parties, policymakers, citizens, higher education institutions, businesses and investors
- Limited fact-based regional decision-making

The City of Reno and its regional partners asked IBM to help craft a data-driven strategy for economic development to help diversify the regional economy. The aim was to apply advanced analytics and use open data to improve regional coordination among policymakers, citizens, higher education institutions, businesses and investors.

The global IBM interdisciplinary team brought deep expertise across a diverse set of disciplines, which helped them to think about the challenges in new and innovative ways. With its alternative view to analyzing problems and developing solutions, the team was able to work with the many different regional constituents and gain the buy-in and momentum required to address the challenges.

# 3. Context for recommendations

## A. Findings and context

For three weeks the IBM Smarter Cities Challenge team worked with stakeholders from the region to understand the issues, assess the options and develop recommendations.

They conducted more than 50 interviews with more than 110 stakeholders who represented public, private and education sectors.

They used a simple Smarter City “scorecard” framework developed by IBM (Figure 1) to summarize the findings.

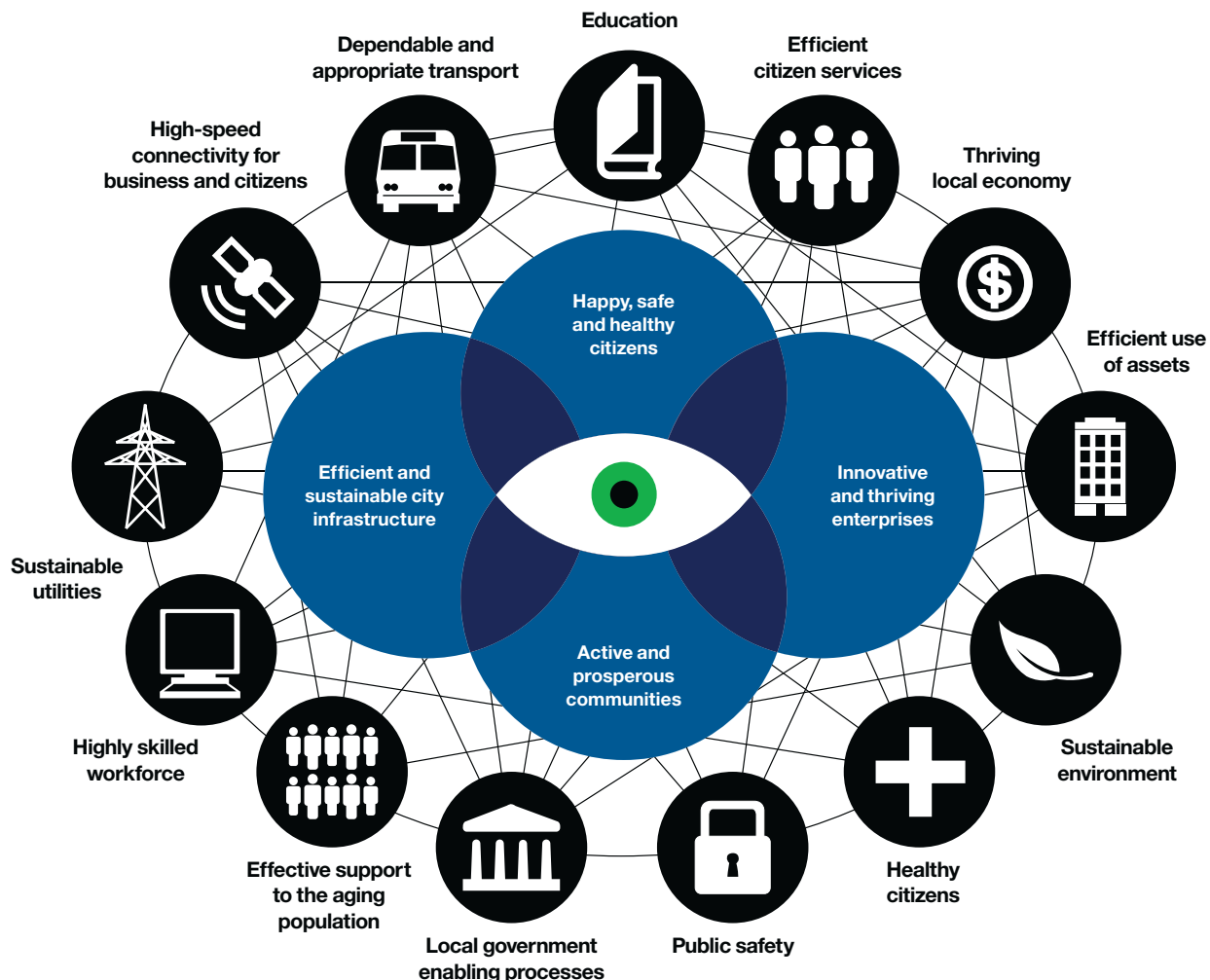


Figure 1



The resulting scorecard for the region is depicted in Figure 2. The ratings below summarize the interview findings.

- **Green** (performing as expected). The region has a lot of advantages such as transportation, high-speed connectivity, sustainable utilities, a sustainable environment and good healthcare.
- **Yellow** (room for improvement). Four areas require improvement:
  - Citizen services and government enabling processes. Examples include cumbersome license and permit processes and inefficient use of IT in these areas.
  - Use of assets. Inefficient application and use of community assets to strengthen the economy such as the university, Desert Research Institute (DRI) and the airport.
  - Public safety. For example, the team heard in multiple interviews that students are not comfortable walking from the university to downtown Reno.
- **Red** (serious issues). Almost every interviewee mentioned education, economy and a skilled workforce as areas of serious concern.

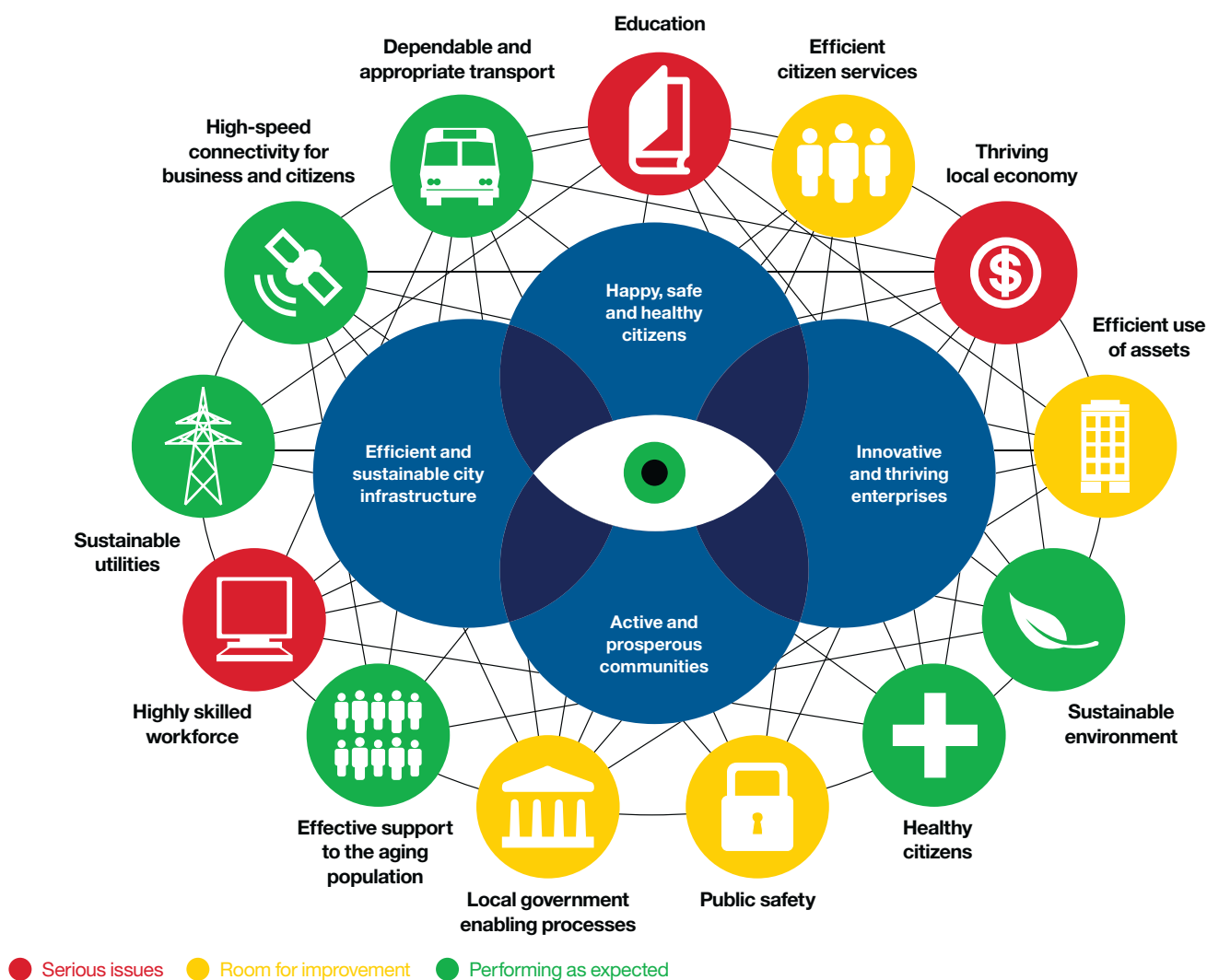


Figure 2

The team combined interview insights with an assessment of a model for a successful Smarter City, economic development assets and best practice to develop a number of findings about the current situation:

- Individual entities work in silos instead of together as a unified region.
- Multiple economic development agencies and authorities represent different parts of the region, resulting in fragmented economic development.
- The region uses many different record systems and data sources, formats, purposes and definitions.
- There is no regionally cohesive data set for insights and decision-making.
- The existence of different visions and objectives among the various agencies dilutes the message.
- Each jurisdiction has its own brand with its own slogan; there is no unifying regional vision and brand.
- The state falls to the bottom at a national level for education and graduation rates.
- The region continues to struggle with investment in education, specifically K-12.
- Businesses considering relocation and investment in the region often cite the lack of a qualified workforce as a barrier.

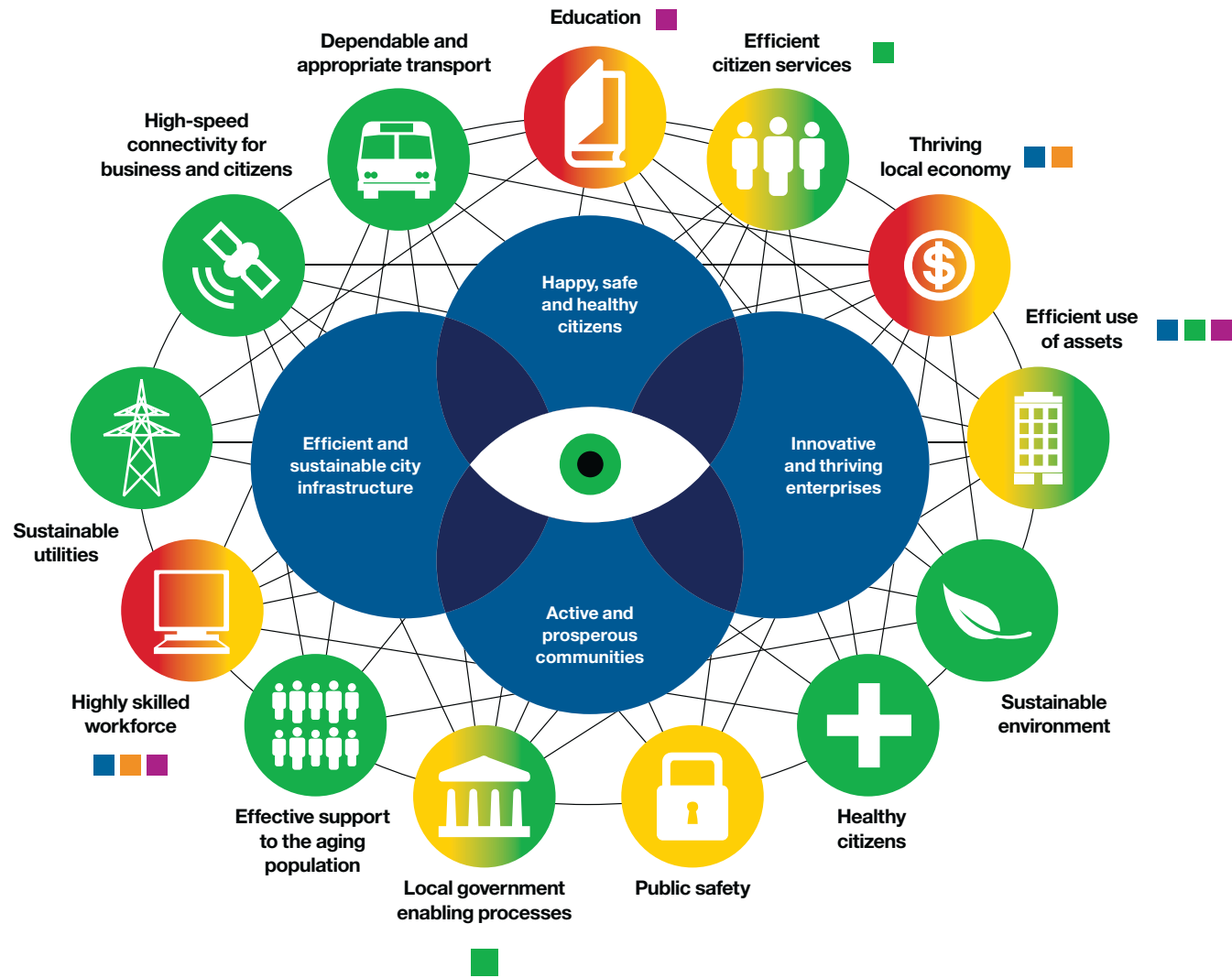
## B. Roadmap of recommendations

After looking at the findings and considering the overarching objective, the team developed a set of five recommendations to establish a framework for regional economic development. The recommendations work together, building on joint successes.

1. **Change your mindset:** Develop an integrated regional economic development strategy.
2. **Be one strong voice:** Present one regional economic development face to the outside world.
3. **Harness your data:** Build a regional “system of systems” analytics utility to support economic development.
4. **Brand the vision, not the slogan:** Present a single strong identity for the city and the region as a whole.
5. **Invest in your people:** Focus on education and workforce development to build a foundation for future growth.

The team completed its recommendations with a 12-month roadmap for immediate action and a governance structure to kick-start economic development in the region. They mapped recommendations on the Smarter City framework and assessed how implementing each could improve the region's scorecard (Figure 3). Public safety is outside the scope of the recommendations and is not included in the roadmap.

The team believes that within 12 months the region could see improvements for some of these dimensions from red to yellow and from yellow to green.



1. Change your mindset    2. Be one strong voice    3. Harness the data    4. Brand the vision    5. Invest in people

Figure 3



The roadmap defines the key milestones required to implement the recommendations over a year. It is segmented by three horizons, as illustrated by Figure 4.

- **Horizon 1:** Set the stage – immediate, up to three months
- **Horizon 2:** Implement the change – six to nine months
- **Horizon 3:** Deliver the vision – 12 months and beyond

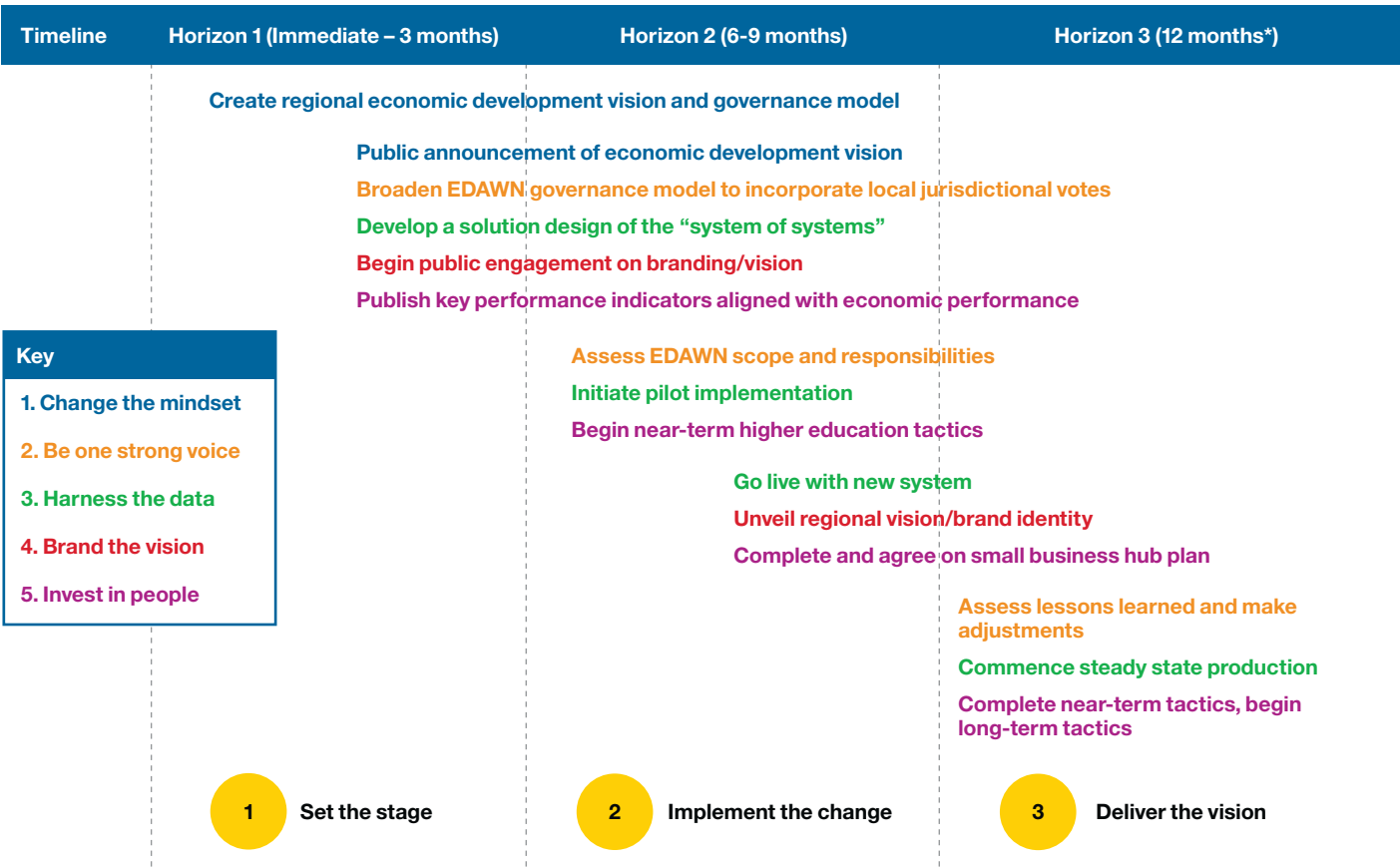


Figure 4

Underlying the roadmap is a set of critical strategic and tactical success factors, as there would be for any large, complex implementation. When applied, these factors raise the probability of success as well as enhance commitment and collaboration among stakeholders. Ownership, empowerment and accountability are key to the success of the recommendations.

Strategic success factors	Tactical success factors
<ul style="list-style-type: none"><li>• Make leadership visible</li><li>• Build a coalition</li><li>• Maintain a joint definition of success</li><li>• Recognize the culture shift</li><li>• Develop a system to engage and communicate</li></ul>	<ul style="list-style-type: none"><li>• Assign a team of people with the appropriate skills, knowledge and time</li><li>• Use standard project management methods</li><li>• Identify appropriate benchmarks and define key performance indicators</li><li>• Celebrate successes</li></ul>

# 4. Recommendations

## A. Recommendation 1: Change your mindset

### Develop an integrated regional economic development strategy with short- and long-term horizons

Quotes from stakeholder interviews (February 2013):

*“Good ole boy network”*

*“...there is a tendency to have disconnect between state and local authorities”*

*“Jurisdictional rivalries”*

*“Boundaries are political not economical”*

*“Gordon Ramsay has to come and clean up this kitchen”*

*“Everybody wants their minute to shine”*

*“All the people have their hands in the cookie jar”*

*“Predatory activities... trust issues”*

In the face of widespread globalization, collaboration forms a vital link between organizations and their clients, suppliers and partners around the world. In order to become more innovative and more competitive, companies and governments are collaborating to:

- Resolve inefficient workflows or bottlenecks that impede productivity
- Leverage knowledge and expertise of key employees
- Break down departmental silos that make it difficult to derive business value from vast amounts of data
- Differentiate products and services for competitive advantage

The State of Nevada had the highest population growth rate in the USA for 19 consecutive years. While Washoe County's population growth rate was slower than that of other parts of the state, its growth rate of 24.13% since 2000 is still more than double the national average of 9.71%<sup>1</sup>. Explosive population growth places increasing demands on services and infrastructure, leading to even more complex demands for regional, state and local entities to collaborate and manage data efficiently.

However, during the course of its interviews, the IBM Smarter Cities Challenge team identified a history of individual entities working separately – or in silos.



### Growth through collaboration

The region once relied on the booming growth of the gaming and construction industries to fuel the economy. But economic conditions have changed. The various entities recognize that if they are to survive and grow again they must collaborate as a region.

Stakeholders accept that a stronger regional voice is more powerful than multiple voices. To move forward, the region needs to start articulating a clear and specific regional vision.

Entities should work together to develop a common, integrated regional economic development strategy, founded on principles of collaboration and joint success. They should seek buy-in from the region's different jurisdictions, which will encourage support when it comes to converting the strategy into specific actions.

A unified regional economic development strategy will demonstrate that:

1. The various jurisdictions have identified new ways of working together and have begun to collaborate
2. Leaders of the jurisdictions are accountable for engaging respective stakeholders and the public, and maintaining momentum

### The governance model

As a first step, the City of Reno Mayor, City of Sparks Mayor and Chair of the Washoe County Commission, with their respective City and County Managers, should meet to discuss this report and fully support the recommendations and desired outcomes. This group already meets quarterly; the team has received commitment that its recommendations would be on the agenda beginning in March 2013, demonstrating full executive leadership buy-in and commitment to a regional economic development approach.

To demonstrate how the region can act upon the recommendations, the team has provided a suggested governance structure (Figure 5) involving the leadership group – which it refers to as “sponsors” – the regional board, and implementation teams. Each of these groups has a unique role and responsibility to support and fulfill the regional vision for long-term collaboration and economic growth.

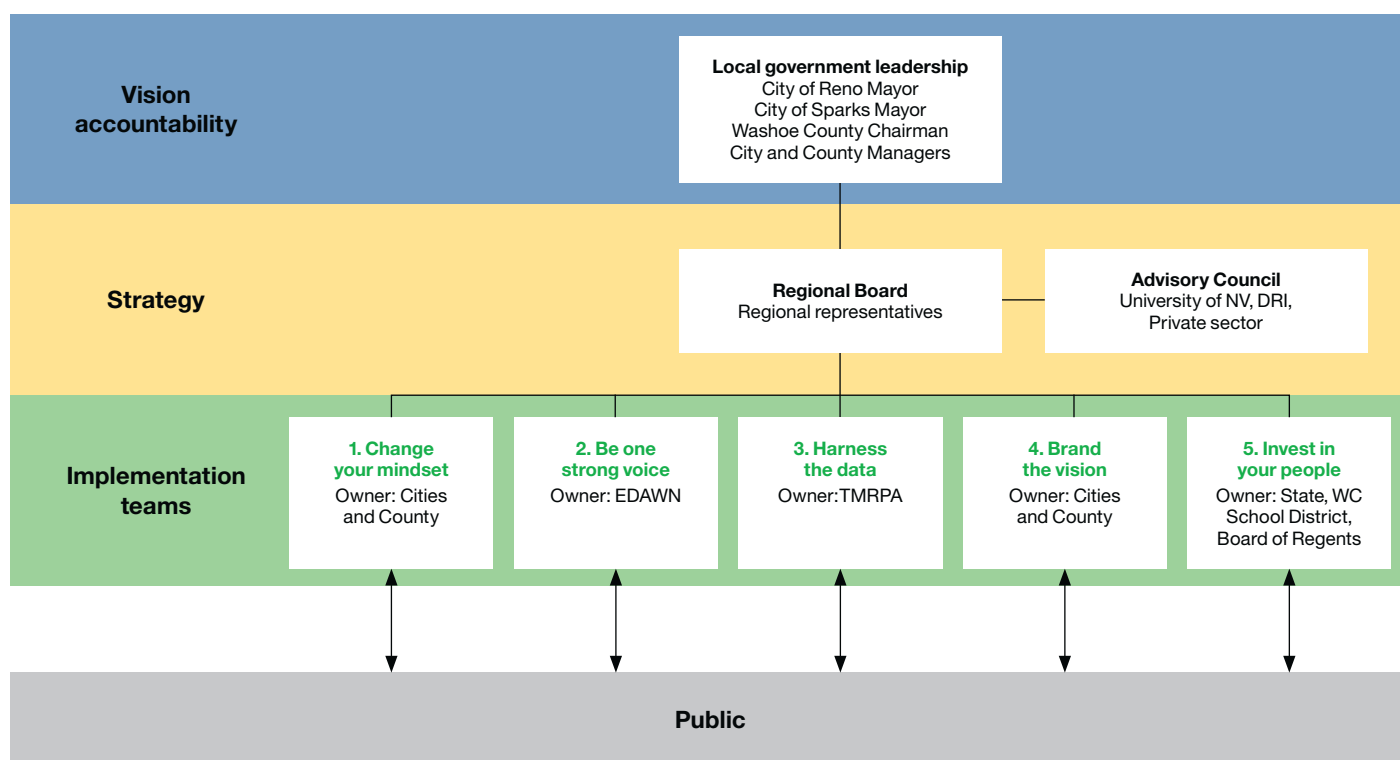


Figure 5

**Local government leadership** acts as sponsors. Leaders own the vision and are accountable for its delivery. They provide consensus for this new view of expanded economic development by creating a vision statement that describes the overall approach and goals for strategic planning. The sponsors review and confirm the governance model and reporting structure for implementing recommendations, including the regional board. Sponsors may want to add members to the board as appropriate to strengthen economic development, recommendation implementation and long-term change.

**The regional board** owns the strategy and is responsible for its delivery. It is composed of one representative from each jurisdiction, who is empowered to make decisions on behalf of each government. The board is the overall management team responsible for implementing recommendations and developing the charter. They codify the scope, expectations, resources and timeline required to implement the recommendations. The board has the authority to make decisions, adjust course and manage risks. If members cannot reach consensus on a particular issue, they escalate it to the sponsors for a final decision. The board then appoints team members and delegates authority to individual implementation teams to execute each recommendation. The board liaises among the sponsors, implementation teams and various stakeholders. It functions as the single point of contact for local approvals and policy matters.

**The advisory council** provides strategic advice and counsel to the board. This group consists of civic, academic and private leaders, such as planners and academics who can identify high-priority issues and analyze data as needed. Each advisory council member provides support, as appropriate, to individual implementation teams.

**Implementation teams** own the tactical execution.

They refine the recommendation, outcome measures and implementation plan, which they present to the board for final approval. Following final approval, the implementation team has full responsibility for making the recommendation a reality. They report regularly to the board on status, issues and risks, and escalate any matters they cannot resolve internally. Membership includes other stakeholders beyond the local governments. Each implementation team, its membership and responsibilities is discussed in more detail in the following recommendations.

**The public** is regularly engaged for comment and feedback. This report only recommends methods of engagement specific to each implementation team. Sponsors and local government will continue to engage the public using established methods to gain insight and input.

The governance model provides a unified view of economic development for the region. It represents a streamlined management approach that demonstrates priorities and calls upon the community's many existing assets. There is a cost associated with this effort, but benefits are reaped as redundant initiatives are reduced, and new collaborations and increased staff morale drive the region toward a common goal.



### Recommendation 1: Change your mindset

The various jurisdictions should look at economic development on a regional scale, coming together as a group to agree on short- and long-term economic objectives.

### Scope and expected outcomes

#### Scope

- Build coalition and collaboration
- Regional leaders agree on a governance model and management system
- Maintain local government's role as liaison on policy matters

#### Expected outcomes

A unified regional economic development strategy.

#### Cost of inaction

This is the cornerstone of the recommendations. The region remains less competitive if it does not improve on current fragmented economic development efforts.

Proposed owner and stakeholders	Suggested resources needed
<b>Owner:</b> <ul style="list-style-type: none"> <li>• City of Reno, Office of the Mayor/City Manager</li> <li>• City of Sparks, Office of the Mayor/City Manager</li> <li>• Washoe County, Office of the Commissioner/County Manager</li> </ul> <b>Stakeholders:</b> <ul style="list-style-type: none"> <li>• Public-private partnerships, including EDAWN</li> <li>• Private sector</li> <li>• Academic institutions</li> <li>• The public</li> </ul>	<b>Cost estimate:</b> Low
Dependencies	Key milestones, activities and timeframe
Agreement from each jurisdiction to <ul style="list-style-type: none"> <li>• Move forward as a region and participate in leadership</li> <li>• Develop a unified regional vision</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Immediate:</b> Leaders from different jurisdictions meet to create a regional economic development vision</li> <li>• <b>Three months:</b> Public announcement of vision and mandate</li> <li>• <b>Three months:</b> Implementation teams begin work</li> <li>• <b>Six months:</b> Implementation teams provide detailed work plans to regional board</li> </ul>
Priority	
High	

## B. Recommendation 2: Be one strong voice

**Present one regional economic development face to the outside world.**

### *“A rising tide lifts all boats.”*

Currently, multiple economic development agencies and authorities represent different parts of the region. This leads to fragmented economic development and dilutes the message to the outside world. Even as a whole, the region's economy is too small to be visible on a national, much less on an international, scale. It cannot afford this fragmentation and dilution.

Based on multiple stakeholder interviews and research into international and national best practice, the Smarter Cities Challenge team recommends designating a single agency as the regional economic development face to the outside world.

The Governor's Office of Economic Development (GOED) designated the Economic Development Authority for Western Nevada (EDAWN) as one of 10 economic development agencies for the state. As such, EDAWN is a strong candidate to become the single face of the region. It is a private/public partnership governed by a board of trustees including representatives from local governments and the private sector. It is fully operational, with a clear regional development strategy and a strong leader capable of implementing it.

To make itself accountable to local jurisdictions, EDAWN must broaden its governance model to incorporate votes from the regional jurisdictions (in particular City of Reno, City of Sparks and Washoe County). Currently, representatives of these jurisdictions are non-voting members of the board.

Once the jurisdictions gain a vote, each needs to delegate part of its “sovereignty” to EDAWN so that it can fulfill its purpose as a single face and voice to the outside world. For example, leads from a site selector or potential investor should be routed to EDAWN, which would coordinate a regional response.

While sometimes one jurisdiction may lose a potential investor and associated tax revenue to its neighbor, the team believes in the concept, “a rising tide lifts all boats.” Each jurisdiction has more to gain than lose in this consolidated economic development effort.

Local jurisdictions should stop thinking of it as a “zero-sum” game. The region needs to convince investors to choose it over national and global competitors. The competition between Reno and Sparks, for example, is not nearly as important as the competition that the region has to win.

EDAWN's strategy already incorporates organic (existing businesses), non-organic (new businesses) and entrepreneurial growth. The team recommends the following enhancements to EDAWN's existing strategy:

- **Outside-in perspective.** Make it easier for potential investors to choose the region over national and global competitors. For example, EDAWN should:
  - Work with local jurisdictions to make it easier to establish or relocate a business (for example, single point of entry for permit approval or licenses)
  - Identify use cases and design a website marketing the region to categories of potential investors (for example, “I am a site selector for a distribution center,” “I want to open a restaurant,” “I want to start a software company”)
- **Success stories.** Identify, develop and promote success stories for target industries (for example, Microsoft License, Apple data center, Patagonia distribution center, Amazon distribution center).
- **Reference businesses.** Maintain a list of references for a particular industry segment to provide positive affirmation, verbally or in writing, on why to do business in the region.

## Recommendation 2: Be one strong voice

The region should designate EDAWN as its regional economic development face to the outside world. EDAWN must broaden its governance model to incorporate votes from regional jurisdictions.

### Scope and expected outcomes

#### Scope

- Broaden EDAWN voting membership to include local jurisdictions
- Delegate regional authority and accountability to EDAWN Director
- Rally around EDAWN as the change agent to galvanize regional support
- Maintain local government's role as liaison for EDAWN and for specific policies

#### Expected outcomes

EDAWN becomes one strong economic development authority representing the region.

#### Cost of inaction

Without a single regional economic development voice, the region cannot compete on a large scale, either domestic or international, making it less competitive and unattractive for new business opportunities.

Proposed owner and stakeholders	Suggested resources needed
<b>Owner:</b> EDAWN  <b>Stakeholders:</b> <ul style="list-style-type: none"> <li>• City of Reno</li> <li>• City of Sparks</li> <li>• Washoe County</li> </ul>	<ul style="list-style-type: none"> <li>• EDAWN should propose to the board the resources needed to fulfill the expanded role and participate in the governing model</li> <li>• Each jurisdiction to provide the resources needed to support EDAWN</li> </ul> <b>Cost estimate:</b> Low
Dependencies	Key milestones, activities and timeframe
Agreement from each jurisdiction to <ul style="list-style-type: none"> <li>• Move forward as a region and participate in leadership</li> <li>• Develop a unified regional vision</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Immediate and continuous:</b> Show visible support and rally around EDAWN as single voice for the region</li> <li>• <b>Three months:</b> Broaden EDAWN governance model to incorporate local jurisdictional votes</li> <li>• <b>Three months:</b> Determine additional changes to EDAWN scope and responsibilities</li> <li>• <b>Six months:</b> Implement any additional changes</li> <li>• <b>12 months:</b> Assess lessons learned and make adjustments</li> </ul>
Priority	
High	

## C. Recommendation 3: Harness the data

### Build a regional system of systems analytics utility to support economic development.

Using the City of Reno challenge statement (see p. 6) as a starting point, the Smarter Cities Challenge team assessed the benefits of a regionally integrated, regionally operated geospatial analytical system – or a “system of systems.”

The system of systems would bring the region advanced integrated geospatial analysis and mapping capabilities. Applying and integrating analytics with current processes and applications would transform decision-making, enhancing their efficacy. Geospatial analytics would consolidate and correlate detailed location information with other data points<sup>2</sup>. The enriching location and geographic feature analysis would transform a partial vision into a holistic view, thereby enabling innovation in economic development and decision-making.

Data analytics and geospatial analytics taken together would drive:

- Fact-based decision-making
- Deeper program and budget analysis and evaluation
- Better risk management
- Outcomes-based and smarter decisions

In addition to consolidating into one regional geographic information system (GIS), the region must streamline the data capture and cleaning processes and develop a roadmap for long-term integration and sustainability, including enhancements.

As part of its Smarter Cities application, the City of Reno envisioned framing the GIS as part of a broader plan to engage local communities in sharing and contracting local services to create efficiencies, cost savings and better service to the public and businesses<sup>3</sup>. Through its interviews, the team observed broad consensus among the jurisdictions that their governments should work with neighbors to sustain economic growth.

---

#### What is a geographic information system?

A geographic information system (GIS) allows anyone to store, manipulate and visualize data displayed on a map for the purpose of intelligent spatial analysis. A GIS can reveal patterns in data, identify relationships and trends, and allow for predictive modeling to understand and plan today for what may impact a business or community tomorrow.

Similar to a photograph or a painting, maps can visually punctuate concepts and ideas – they can record history, model changes and envision the future. Interpreting patterns and trends depicted by a map can transcend language and cultural barriers and is a powerful tool for critical decision-making.

There are many different kinds of maps and many different kinds of problems that are solved using maps: planning growth for a city, providing services to a community, managing public infrastructure, developing or evolving a business, or improving emergency response operations.

A GIS allows users to compile and communicate large amounts of information, and through visualization, easily reveal relationships and patterns in user data. GIS maps are built on a formal GIS information model that describes geographic features, founded on map layer concepts, and that can be deployed on the web, to desktop apps, through servers, and to mobile devices.

– IBM developerWorks®

---

More information is available today than is necessary to make effective decisions. We are facing a “data paradox” – too much data and too little insight. The overabundance of data makes it more difficult to receive value from the massive amounts of data collected, stored and managed. The use of public sector information (PSI) is steadily increasing in variety, volume and use as well as the type of users exploiting it (see Figure 6). The challenge is to eliminate irrelevant information so the user can focus on relevant information.

PSI is expected to be inherently accessible and transparent. Federal and local governments are moving toward defining and executing open data policies, for example:

- Federal open data policy<sup>4</sup>
- Nevada Open Records Act, NRS Chapter 239, which encompasses a series of laws designed to guarantee the public has access to public records of all levels of government in Nevada
- The City of Reno Open Data initiative<sup>5</sup>

Uses of PSI	Users (examples)		Types of outcomes	Examples of outcomes
<b>Improve public services and public administration</b>	<ul style="list-style-type: none"> <li>• Mission or program constituents</li> <li>• Employees</li> </ul>	<ul style="list-style-type: none"> <li>• Policymakers</li> <li>• Agency heads</li> <li>• Politicians</li> </ul>	<ul style="list-style-type: none"> <li>• Mission outcomes</li> <li>• Program outcomes</li> <li>• Operational results</li> </ul>	<ul style="list-style-type: none"> <li>• Enhanced economic security of low-income workers</li> <li>• Reduced risk of recidivism</li> <li>• Reduced unit cost per outcome, increased productivity</li> </ul>
<b>Increase social and economic benefits to taxpayers</b>	<ul style="list-style-type: none"> <li>• Communities</li> <li>• Taxpayers</li> </ul>	<ul style="list-style-type: none"> <li>• Citizens</li> <li>• Politicians</li> </ul>	<ul style="list-style-type: none"> <li>• Public outcomes</li> <li>• Taxpayer outcomes</li> <li>• Policy outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Safe and vibrant communities</li> <li>• A sustainable safety net</li> <li>• Improved access to education</li> </ul>
<b>Enhance citizens' awareness of their rights</b>	<ul style="list-style-type: none"> <li>• Citizens</li> <li>• Policymakers</li> </ul>	<ul style="list-style-type: none"> <li>• Politicians</li> </ul>	<ul style="list-style-type: none"> <li>• Citizen outcomes</li> <li>• Policy outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Increased trust in government</li> <li>• An engaged citizenry</li> </ul>
<b>Promote excellence in research and development</b>	<ul style="list-style-type: none"> <li>• Scientists and researchers</li> </ul>	<ul style="list-style-type: none"> <li>• Investors</li> <li>• Businesses</li> </ul>	<ul style="list-style-type: none"> <li>• Scientific outcomes</li> <li>• Environmental outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Accelerated discovery of cures, safer drugs</li> <li>• Sustainable resources, improved environmental safety</li> </ul>
<b>Foster economic growth of information-related industries</b>	<ul style="list-style-type: none"> <li>• Businesses</li> <li>• Investors and entrepreneurs</li> </ul>	<ul style="list-style-type: none"> <li>• Citizens</li> <li>• Workers</li> </ul>	<ul style="list-style-type: none"> <li>• Business and industry outcomes</li> <li>• Citizen outcomes</li> </ul>	<ul style="list-style-type: none"> <li>• Differentiated products and services, access to skilled workforce</li> <li>• Higher-quality jobs</li> </ul>

Figure 6



Public sector organizations have access to increasingly sophisticated professionals in areas of information management, analytical modeling/techniques, and analytics tools and technologies. The challenge is to unleash the potential of analytics while managing the velocity (how fast an organization is able to get and analyze data), volume, variety and veracity (reliability) of the data. IBM's Institute of Business Value surveys reveal that public sector analytics professionals spend 47% of their time collecting and organizing data, and less than a third of their time on sophisticated analysis<sup>6</sup>.

The system of systems represents a regional effort to overcome barriers and foster systematic analytics adoption for economic development and decision-making. In order to realize its vision, the region must address its technical, organizational and collaboration challenges:

- **Leverage open data policies and available data sources.** Simply owning most information is no longer a competitive advantage; innovation is the result of sharing knowledge. The organization responsible for the data (owner) identifies and maintains the master data sources with their associated security and privacy policies. The challenge is then to get each owner to commit to data sharing, quality and maintenance, and to immediately address situations that can exacerbate information management tensions and stymie effective action. Truckee Meadows Regional Planning Agency (TMRPA, owner of the system of systems) must guarantee to the data owners that it adheres to the treatment of Personal Identifiable Information (PII) through data masking (see Figure 7) or temporal/spatial one-way aggregation<sup>7</sup>. With the support of GOED, TMRPA needs to investigate and determine if any legislative changes are required to access and share data.

- **TMRPA must be empowered** to lead the implementation team, develop the technical design and determine the sourcing strategy for services, leveraging regional infrastructure and resources. Desert Research Institute (DRI) must serve as a technical advisor, complementing TMRPA leadership with valuable competencies and infrastructures in geospatial databases, analytics and advanced visualization.
- **Collaboration is a key success factor** for the system of systems. The region has invaluable local resources. The University of Nevada and DRI have advanced competencies in business and geospatial analytics. EDawn and the Chamber of Commerce promote the availability of private sector data sharing. The local government and private sector have valuable geo-referenced data. The ability to engage and involve such entities is a precondition for success.

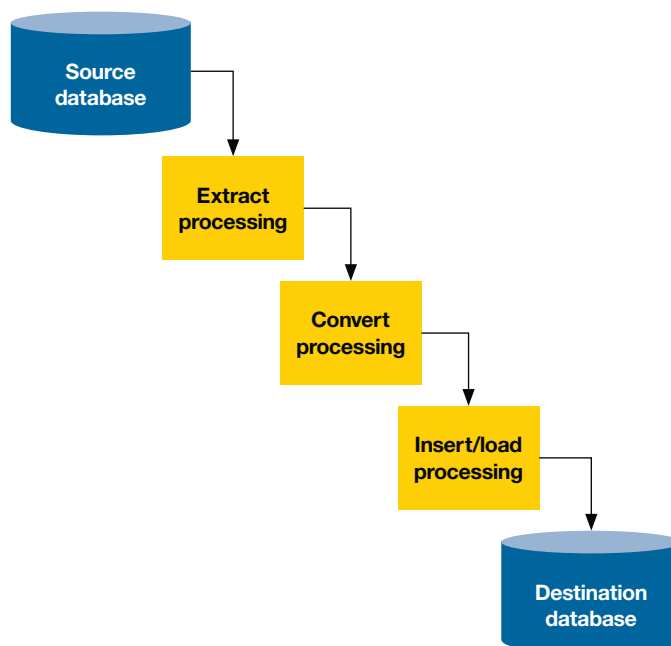


Figure 7

The next stage is the implementation process and the proposed reference architecture.

Figure 8 depicts the implementation process. It identifies the activities (in blue chevrons) and construction blocks (in yellow boxes).

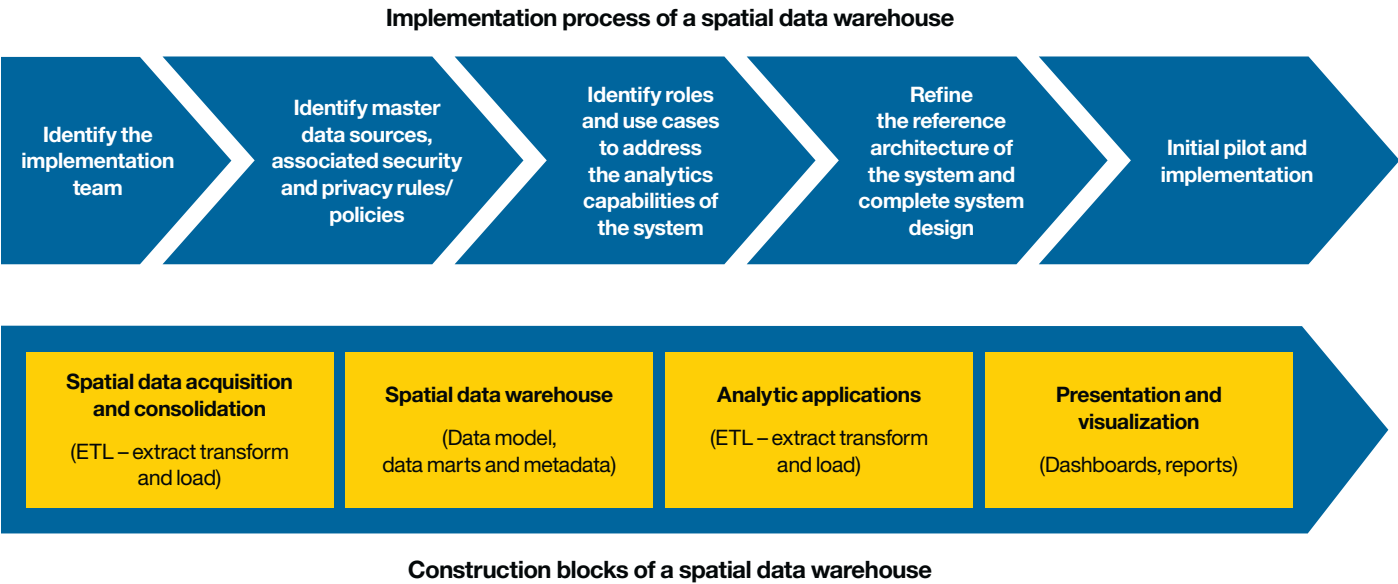


Figure 8

There are five major activities explained in the table below:

Timeline	Activity
Immediate	<b>Identify and launch implementation team.</b> TMRPA and DRI Technical Advisor host an interdisciplinary meeting with key stakeholders to outline the plan of action and discuss key themes, such as implementation team responsibilities and accountability.
3-6 months	<ul style="list-style-type: none"> <li>• <b>Identify master data sources and associated security and privacy rules/policies.</b> With the support of DRI, TMRPA selects the data masking techniques it will apply to the identified data and transformation.</li> <li>• <b>Identify roles and use cases to address system analytics capabilities.</b> The implementation team defines the roles and use cases needed to match business users and policymakers' requirements. This step helps the team understand how to integrate the system of systems with other regional websites and portals, as well as integrate with current local government systems of record.</li> <li>• <b>Refine and detail the system of systems reference architecture.</b> The architecture, as explained below, provides a framework for IT architects to design and secure the overall system.</li> <li>• <b>Develop a solution design.</b> The implementation team coordinates the development of the architecture, artifacts, product selection and operational modeling needed.</li> </ul>
6-9 months	<b>Refine the solution design and initiate pilot implementation.</b> Based on the system design, TMRPA implements the identified functional components through a "buy or build" decision.
9-12 months	<b>Implement any pilot changes and go live.</b> The pilot then becomes the production system by adding the necessary resources to meet the required service level agreements and capacity estimation.
+12 months	Steady state production.

The team identified several sources for master data as depicted in the table below.

Type of data*	Source/owner
Parcel information	Washoe County
Economic information	University of Nevada
Tax information	Nevada Tax Department
Crime and incidents	Regional police and fire departments
Infrastructure	Utilities and regional public work departments
Environmental	Desert Research Institute
...	...

\*See appendix D for a full list of the data available.

Based on solution architectures that have been designed and successfully deployed to address the similar types of requirements, the team recommends the architecture depicted in Figure 9. The reference architectures incorporate knowledge, patterns and best practice gained from previous implementations.

Using reference architecture has the following benefits:

- **Separation of concerns (SoC):** When components are built with the SoC design principle the system designer can change one component with no or minimal impact on other components.
- **Risk mitigation:** Proven architectural foundation can be reused and adopted to meet project needs, improving the risk profile.

- **Cost reduction:** Development costs are reduced as architecture doesn't need to start from scratch.
- **Simplify decision-making:** The business view of a reference architecture outlines what benefits could be derived by selecting a solution based upon it.
- **Improved deployment speed:** The description associated with layers, building blocks and components of reference architecture outlines key principles, architecture decisions, deployment scenarios and guidance for developing a solution.

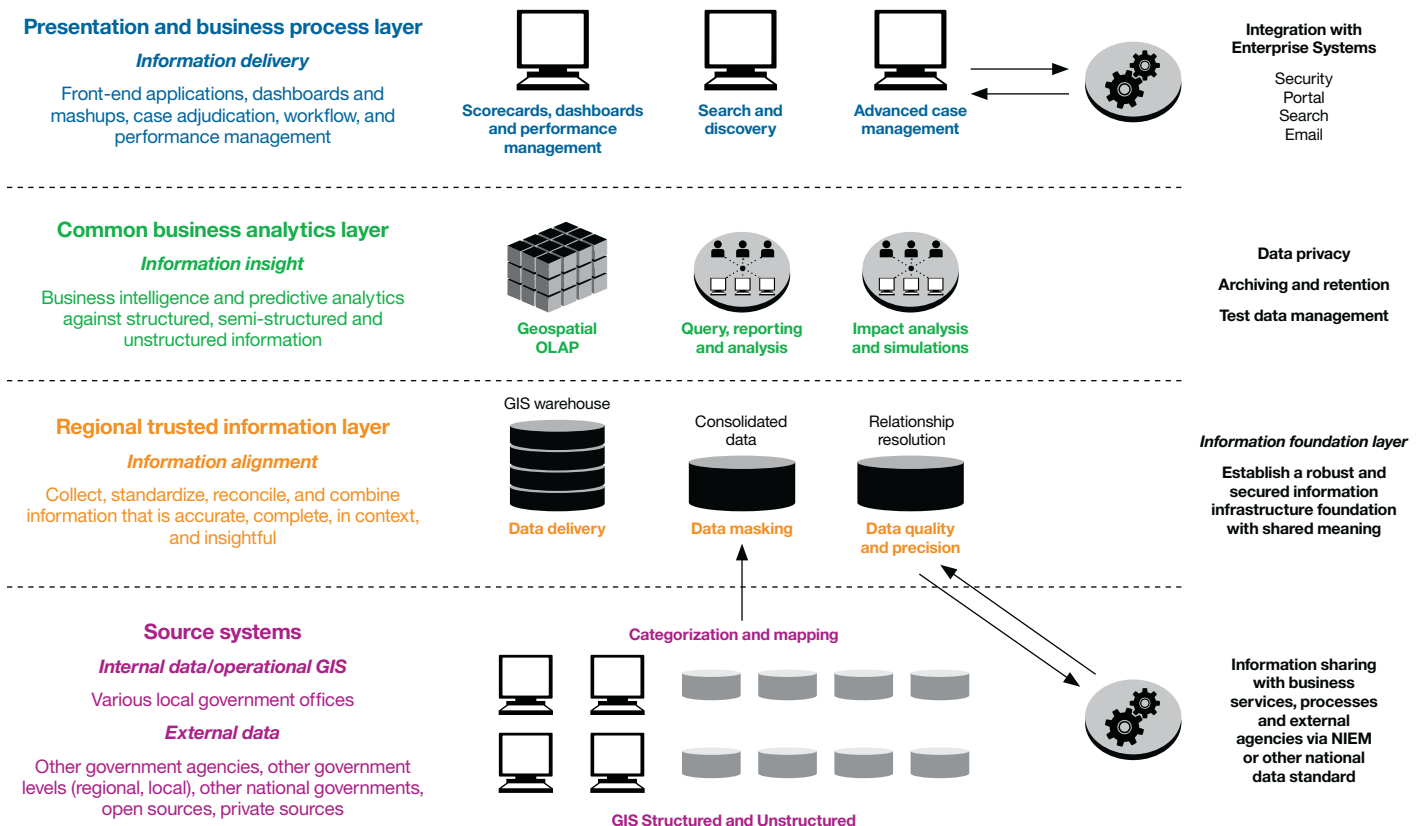


Figure 9

There are three major layers in the architectural design:

**Presentation and business process layer:** Presents and visualizes analysis results. The capabilities can be local (a local website or portal) or remotely integrated in external websites. Functionality includes case management, providing a comprehensive view of the case using advanced analytics, business rules, collaboration and social software. Visualization is an important component of this layer relating to the creation of a dashboard and performance management system that synthesize and elaborate results. DRI's advanced competencies in this area can be leveraged. This layer includes the capability to integrate external systems needed to fulfill the business process triggered by the analysis (for example, the local government business license process).

**Common business analytics layer:** Implements the analytic and simulation capabilities interacting with the regional trusted information layer to query geospatial data and dynamically aggregate and analyze it. This layer also features simulation and “what is” analysis, as well as report generation to perform forecasting based on boundary condition changes. Big data analytics are a component of this layer, enhancing core capabilities with access and analysis of structured and unstructured information (for example, sentiment analysis). This layer can answer queries like: “Find the customers who live within the flood zone or within two miles of the boundary” or “What is the tax and infrastructure impact of opening a datacenter in this particular zone?”<sup>8</sup>

**Regional trusted information layer:** Hosts the regional GIS data warehouse where the data (GIS layers, infrastructure, economic and demographic information) from the source systems are:

- Transformed to adapt the data to the system of systems data model
- Masked or aggregated (in space and/or in time) to comply to attached privacy and confidentiality policies
- Enriched with additional information available in the system of systems

This layer hosts the maps and imagery used by the GIS server where other information is correlated and implements the integration protocols and capabilities needed to flow in data from external systems or databases.

Spatial technology continues to move into mainstream business processes, integrating analytical tools and spatial awareness<sup>9</sup>. Integration happens in both directions; spatial analysis tools pass queries to the geospatial data warehouse and big data engines, while tools that understand business data integrate and exploit spatial visualization capabilities (Figure 10).

This mix of visualization and analytical power opens new routes to capture insights from data that otherwise were obscured. This gives organizations a competitive advantage by helping them to anticipate decisions and performing advanced, fact-based forecasting and simulation.

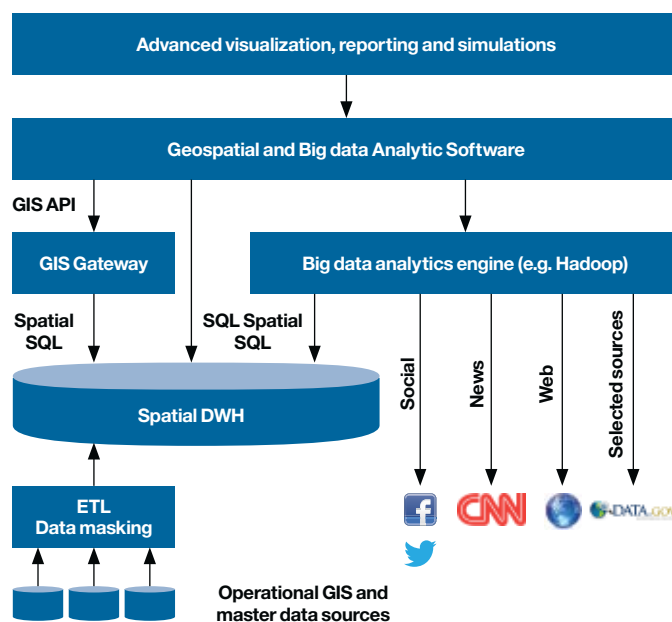


Figure 10



In summary, the systems of systems creates a regional analytics utility that plays a pivotal role in coordinating and communicating across multiple regional domains. It is based on open standards that can be extended and integrated with the existing City systems and infrastructure. It offers the necessary security and access controls to properly conduct local policy decision-making and regional business development.

Figure 11 combines the system of systems structure with the context in which it operates. Users can consume system services through locally operated portals, external regional portals and websites. This helps users enhance their content and analytical capabilities.

- The “Business point of access” block offers user interaction services and multi-device visualization. Dashboards, scorecards, performance management visualizations and reporting can also be developed.
- The “Business and policy analytical services and simulations” block delivers geospatial analytics functions and contains future analytics capabilities related to big data, brand, sentiment and social analysis. This block delivers impact analysis for “what if” simulations, forecasting and reporting.
- The “Analytical datastores” block includes the GIS server and the data warehouse for operational GIS and external partners’ data.
- The “Integration services” block enables integration with external data and services providers. Integration protocols should be based on open standards like National Information Exchange Model (NIEM)<sup>10</sup>.

The reference architecture also includes “Privacy and security services” for authorization, identity management, auditing and access control. The administrator governs security policies, user roles, definitions and data access policies.

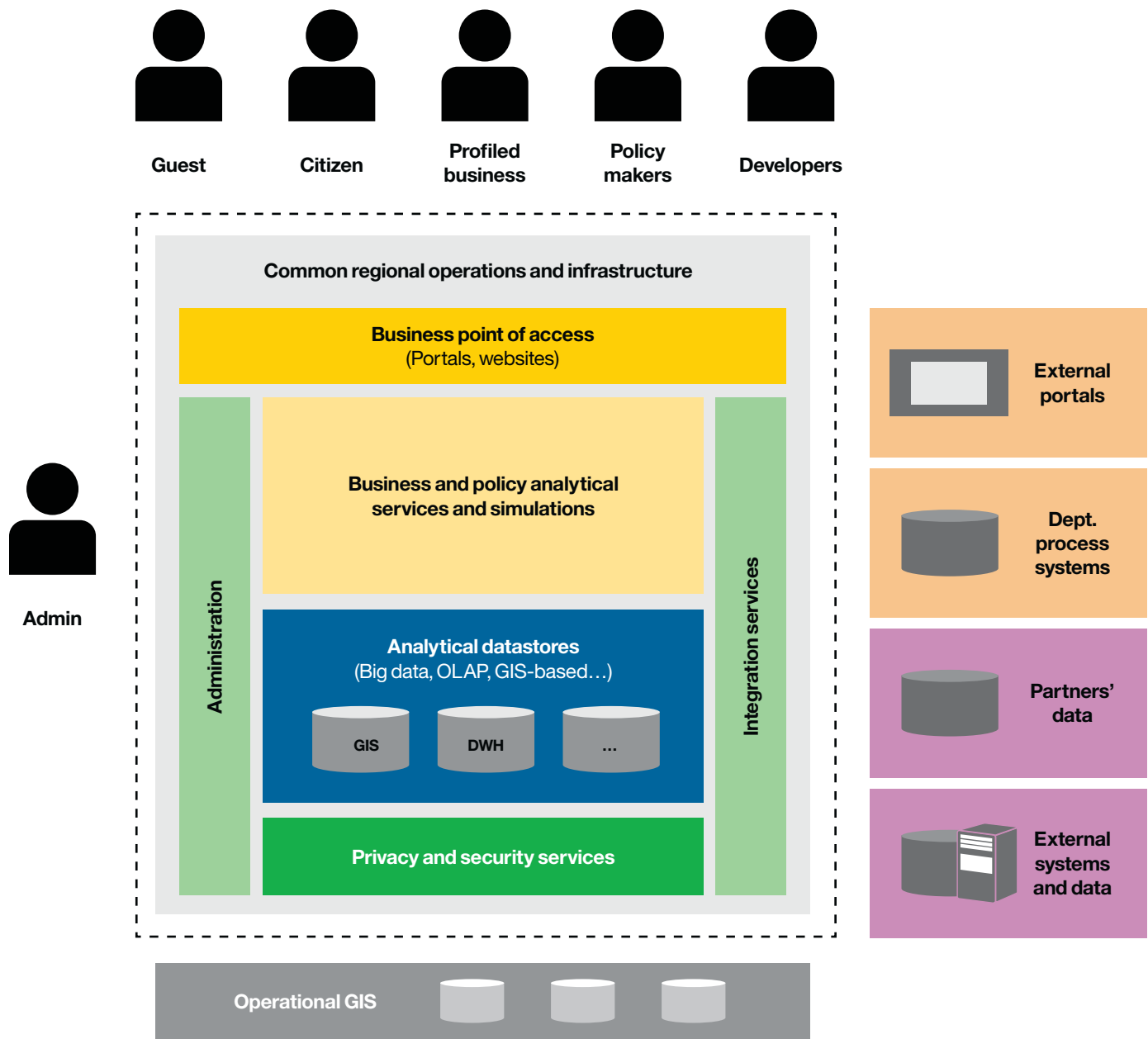


Figure 11

---

### Recommendation 3: Harness the data

---

The region should harness its data to improve economic development and better support the decision-making process. It will need to implement a system of systems analytic utility and a common agreement among local entities to share their data.

---

#### Scope and expected outcomes

---

##### Scope

- Lead a regional effort to move the decision-making process and economic development toward a model that is more data-driven
- Implement geospatial analytics as the tool to help economic development. This system of systems will be used for policy decision-making and to foster economic development
- Make use of open data in the region, securing the required commitments and funding

##### Expected outcomes

- A regional operating infrastructure as the first nucleus of collaboration and service-sharing
- Collaboration and trust among the regional entities
- Sharing of information fosters innovation, leading the way for social and economic environment

##### Cost of inaction

Each regional entity continues to maintain data silos and knowledge boundaries, missing the opportunity to collaborate for a common goal.

---

Proposed owner and stakeholders	Suggested resources needed
<p><b>Owner:</b> TMRPA</p> <p><b>Technical advisor:</b> DRI</p> <p><b>Stakeholders:</b></p> <ul style="list-style-type: none"> <li>• City of Reno</li> <li>• City of Sparks</li> <li>• EDAWN</li> <li>• Washoe County</li> </ul>	<p>TRMPA and DRI should propose to the board the economic resources and technical expertise needed to build the system of systems. The region must secure the necessary funding and commitments to make the project a success.</p> <p><b>Cost estimate:</b> Medium: Project funding, software licensing, master data sources ownership and committed funding</p>

---

Recommendation 3: Harness the data (continued)	
Dependencies	Key milestones, activities and timeframe
<ul style="list-style-type: none"> <li>• Success of recommendation 1</li> <li>• Implementation team in place</li> <li>• Data access approval, if required</li> </ul>	<p><b>Phase 1: Short- and medium-term</b></p> <ul style="list-style-type: none"> <li>• <b>Immediate:</b> Hold interdisciplinary meeting constituted by the owner and stakeholders to outline plan of action and discuss key themes</li> <li>• <b>Three months:</b> Select master data sources and define an agreement with the owner</li> <li>• <b>Three months:</b> Design the system of systems</li> <li>• <b>Six months:</b> Initiate pilot implementation</li> <li>• <b>Nine months:</b> Implement any pilot changes and go live</li> <li>• <b>12 months:</b> Steady state production</li> </ul> <p><b>Phase 2: Long-term</b></p> <ul style="list-style-type: none"> <li>• Expand beyond GIS to other analytics <ul style="list-style-type: none"> <li>– Advanced analytics with dashboard reporting, site behavioral analysis and big data analytics</li> <li>– Social sentimental analysis for brand recognition</li> </ul> </li> <li>• Develop regional integrated portal</li> <li>• Evaluate alternative (but integrated) sourcing alternatives</li> <li>• Advanced simulation and visualization (in partnership with DRI)</li> </ul>
Priority	
High	

## D. Recommendation 4: Brand the vision, not the slogan

**Present a single strong identity for the city and the region as a whole.**

A brand is “a name, term, design, symbol, or any other feature that identifies one seller’s good or service as distinct from those of other sellers.” Good brand management requires an organization to understand the features important to its customers and to differentiate those features from the competition.<sup>11</sup>

A strong brand has several characteristics:

- **Laser focus:** It is not all things to all people; it focuses on what it does best.
- **Industry leader:** It ranks number one in a brand category compared to competitors.
- **Compelling/consistent look and feel:** It has a polished, professional look and feel that is consistent across all communications and makes its products instantly recognizable.
- **Understanding of needs:** The organization understands its own value and knows how to emphasize it.
- **True to experience:** It has loyal, passionate customers who experience minimal dissatisfaction and frustration with the organization, service or product.

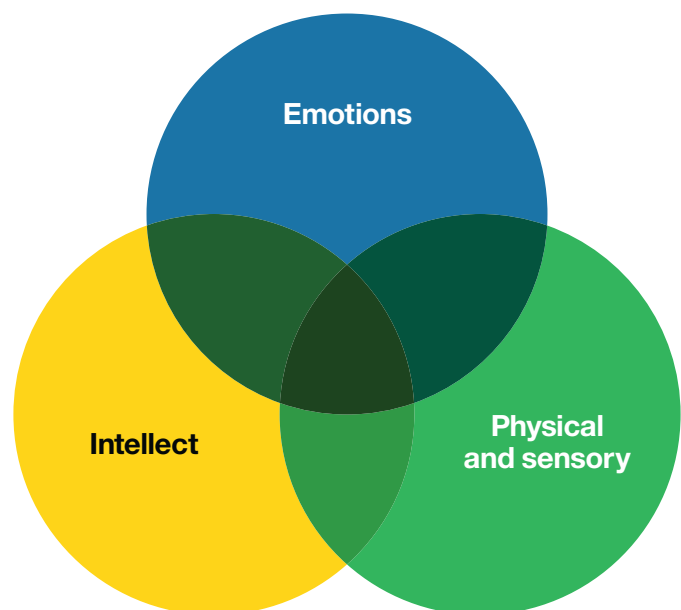
The region has multiple brands within it, each with its own slogan. Some define a jurisdiction, while some define the entire region. Each entity has invested time and money in developing them. Some have caught on; some have not. Some were not even intentional, but reflect a period in regional history or media. For example:

- **Reno:** “Divorce capital,” “Gaming capital,” “Reno 911,” “Biggest little city in the world”
- **Reno Sparks Convention and Visitors Authority (RSCVA):** “All seasons, a thousand reasons”
- **Sparks:** “It’s happening here!,” “Sparks – we love the difference”
- **Washoe County:** “Many communities. One county.”

The Smarter Cities Challenge team found it difficult to understand and articulate the regional brand.

For economic development to take hold, the region needs to determine its brand and message, and galvanize around it. Local entities then need to support this wider regional brand, linking (Figure 12):

- **Emotions:** How people feel about the region
- **Intellect:** How people think about the region
- **Physical and sensory:** How people experience the region



**Figure 12**

The brand should reflect the values and attributes required to intellectually and emotionally connect the region. The brand, in essence, becomes the report card on whether recommendation 1 (Change the mindset) has taken hold and become assimilated into the region’s fabric. The brand helps define and, in some cases, bridge the gap between expectations and experience.



To develop an integrated regional brand that encompasses these three elements, the implementation team should work together to address, among others, the following important questions:

1. What is the region's current brand? What is it made up of?
2. What elements strengthen the brand? What weakens the brand?
3. Why have historical rebranding efforts failed to yield desired results? What steps need to be taken this time to avoid failure?
4. How does the region want to define itself?
5. What steps does the region need to take to redefine its brand? When should these things happen, and in what order?
6. How will the region engage the public with its brand identity? Using what media?
7. Who will be accountable for the ultimate regional brand and the next steps?
8. How will the brand continue to evolve over time? What governance, including roles and responsibilities, are needed?

The City of Reno should use the same model to determine its own brand. As the region's anchor city, Reno must have strong brand recognition. The City may want to consider how to incorporate "university town" into its brand and vision.

### The role of the public

The public must play a key part in the brand creation and promotion – it lives the brand. A strong brand will be easily recognizable and capture the city's identity. The implementation team responsible for branding must actively engage the public face-to-face and online, continually seeking feedback.

The region must engage and better predict public behavior and choices, using actionable analytic insights. The region must use social media and social business tools to identify gaps in how well it is meeting expectations. This will also refine the communication and economic development efforts. As a final step, the implementation team should put systems in place to manage the risks of being more open in regional communications, including social media.

With strong public engagement, reflecting the regional brand and values, the region will continue to grow and thrive over time. By maintaining positive dialogue followed by action, it will be better equipped to adapt more quickly to changes in the environment.

#### Recommendation 4: Brand the vision, not the slogan

The region needs to unite the individual brands of each jurisdiction and represent itself to the outside world with one strong regional brand. As the anchor city, Reno also needs to also re-evaluate and re-establish its brand.

#### Scope and expected outcomes

##### Scope

- Assess the existing brands and develop a single brand for the region
- Evaluate which regional strengths to focus on and define future brand elements
- Define the approach, identify priorities and create an implementation plan with specific roles and responsibilities
- Engage the public in brand definition and evolution
- City of Reno to build on current recognition and success of its "Biggest little city in the world" slogan, potentially evolving it toward its vision of a university town

##### Expected outcomes

- Improved external perception of what the region and Reno have to offer, beyond the current legacy of divorce and gambling
- Better awareness of the many positive experiences to be had in the region
- Businesses are attracted and retained, eager to become part of the region's future

##### Cost of inaction

Many local brands and no strong regional brand. People seeking information about the region receive information from many different sources, and many weak messages instead of one coherent message describing its strengths.

Proposed owner and stakeholders	Suggested resources needed
<ul style="list-style-type: none"> <li>• Collaborative community</li> <li>• City of Reno, Office of the Mayor/City Manager</li> <li>• City of Sparks, Office of the Mayor/City Manager</li> <li>• Washoe County, Office of the Commissioner/County Manager</li> </ul>	<ul style="list-style-type: none"> <li>• Funding related to branding strategy and collateral</li> <li>• Online platforms for public engagement, including the Internet, Twitter and Facebook</li> <li>• Ability to run analytics on social media engagement</li> </ul> <p><b>Cost estimate:</b> Low/medium</p>
Dependencies	Key milestones, activities and timeframe
<ul style="list-style-type: none"> <li>• Success of recommendation 1</li> <li>• Effective public engagement with the brand</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Immediate:</b> Launch the implementation team leadership and vision/brand identity effort. Identify tools, techniques and processes to conduct public engagement and associated outcomes</li> <li>• <b>Three months:</b> Public announcement of vision/branding initiative, begin public engagement</li> <li>• <b>Six months:</b> Define vision and brand identity and determine changes to current marketing plan</li> <li>• <b>Nine months:</b> Unveil regional vision/brand identity and implement new marketing and collateral scheme</li> <li>• City of Reno to follow a parallel path. Any public engagement, including communications and meetings, should be done in conjunction with the regional brand so as not to develop channel confusion</li> </ul>

#### Priority

High

## E. Recommendation 5: Invest in your people

### Focus on education and workforce development to build a foundation for future growth.

Attracting and retaining businesses is key to economic development, but organizations depend on an available skilled workforce. A region's labor pool is made up of local citizens, college and university graduates, and professionals migrating from other cities.

Many stakeholders cited the lack of a qualified workforce as a challenge for the region. Less than 30% of the population has a higher education degree<sup>12</sup>. The Washoe County school district faces an image problem and must overcome a number of big issues if it is to adequately prepare today's students as tomorrow's workforce. Nevada has ranked no higher than 49th in the nation for education for the past four years<sup>13</sup>. The state has the highest unemployment rates in the country, driven by losses in the gaming and construction industries.

Every person the Smarter Cities Challenge team spoke with discussed the importance of education and the urgent need to work together to address the problem.

### K-12 schools

To attract young families and increase the labor pool, the region needs to continue its focus on improving K-12 education. Young families fuel economic development as part of a vibrant and growing workforce.

Washoe County's current Five Year Strategic Plan addresses graduation rates and exposes students to fresh ideas with its High School Academies<sup>14</sup>, but it may not be enough. The region's public, private and higher education institutions should continue to invest time in support of strategic plan initiatives, such as:

- Recruiting businesses and academics into schools to encourage interest in science, math and technology
- Developing liaison programs that spark an interest in higher education
- Developing positive role models
- Cultivating community outreach programs
- Integrating families as a vital link in the education process
- Increasing arts and cultural programs
- Making students employment-ready

Addressing the K-12 program today will have a long-term positive impact on graduation rates and the number of educated young people in the region. The economic benefit will be increased business investments, entrepreneurship and a positive business climate.

---

*“We need to improve the state’s image and assets for attracting a creative class and high-tech workforce. Nevada’s case for business attraction and growth has in the past focused almost exclusively on the state’s low-cost, low-regulation, business-friendly environment. While these qualities are important, they will not be enough to attract the higher-end, higher-skill, high-tech businesses that the state is interested in growing.”*

“An Economic Development Agenda for Nevada,” a study by  
The Brookings Institution Metropolitan Policy Program, 2011

---

### Workforce development and higher education

The team heard in its interviews that the region’s citizens want to work, but cannot always find employment in a dynamic economic environment.

In the past, it was not always necessary to have an education to get work in the region. An individual could drop out of high school and immediately secure employment earning \$50-\$60,000 as a casino or resort valet driver, but those days are over and the workforce needs a new focus. The gaming industry has lost almost 50% of its revenue since 2000<sup>15</sup>.

The region has excellent transportation, telecommunications and building infrastructure, along with natural beauty and stable environmental conditions. These assets can be leveraged to attract new industry and technology. For example, Apple recently announced plans to open a data center in Reno. The region needs to nurture a workforce that meets the needs of the types of businesses it attracts.

Collaboration between colleges and businesses can help make education more career-focused and engage students with real-world vocational opportunities.

The implementation team must create a structured education program that focuses on training the workforce. In partnership with EDAWN, it should identify workforce programs that help targeted industries to fulfill their future labor requirements. The team should take the following steps:

- Identify key performance indicators (KPIs) to assess progress and measure outcomes
- Assess current available workforce (catalog skills)
- Assess current and future workforce demand
- Identify and predict workforce gaps
- Design and implement near- and long-term tactics to close workforce gaps

Meanwhile, the implementation team must rally support for the TechHUB initiative<sup>16</sup>, which is currently in development. TechHUB is a model of entrepreneurship serving talented, forward-looking thinkers and providing business support expertise. It also promotes downtown revitalization, bringing people and business into the center of Reno and encouraging increased industry and private sector involvement in higher education. The team should engage the retired community as an integral part of TechHUB, providing advice, expertise and valuable life lessons.

Desert Research Institute (DRI) is an untapped world-class institution in the region’s backyard, literally located next to Truckee Meadows Community College (TMCC). As a partner on the ground, DRI must engage the community, investing in today’s students and building more interest in science, technology, engineering and math (STEM). DRI should provide opportunities and expand horizons by serving as a mentor, offering local internships, teaching technology classes and inspiring young people at local schools.

The following table outlines a starting point for near- and long-term tactics to help close workforce gaps. The implementation team will validate and expand upon this list as part of its assessment.

Near-term recommendations	Long-term recommendations
<ul style="list-style-type: none"><li>• Align training programs with industry focus areas</li><li>• Pursue an industry internship program</li><li>• Leverage existing programs at TMCC</li><li>• Develop mentoring programs to expand individual opportunity</li><li>• Review career placement centers and identify outreach methods to link students to regional jobs</li><li>• Engage Chamber of Commerce as a liaison between existing industries and educational institutions</li></ul>	<ul style="list-style-type: none"><li>• Align University of Nevada and other programs with industry needs</li><li>• Develop management training programs in partnership with core industries</li><li>• Explore establishing University of Nevada Endowed Chair for programs that represent key regional markets</li><li>• Enhance the University of Nevada and other career centers to help retain graduating seniors to find regional jobs</li></ul>

Funding

From preschools to higher education, Nevada schools face a constant funding challenge. To jump-start the effort, a collective team of academic institutions, private companies, local jurisdictions and the public (the implementation team) should identify the funding required for the near term and identify creative ways to garner it. This team needs to gain the support of powerful local leaders to act as champions and lead the fight for more education investment and support. Then, in the long term, the implementation team must determine a sustainable funding model required for its initiatives and investments.



---

**Recommendation 5: Invest in your people**


---

The region needs to make targeted investments in education (K-12) and workforce development by aligning, supporting and developing existing assets.

---

**Scope and expected outcomes**


---

**Scope**

- Invest in and support the Washoe County Five Year Strategic Plan
- Collaborate with colleges and businesses to improve technical education programs
- Partner with EDAWN to identify workforce programs for targeted industries
- Support the TechHUB initiative in downtown Reno
- DRI to provide opportunities for technological growth as mentors, teachers, funders and inspirers of young people
- Identify KPIs to assess progress and measure outcomes

**Expected outcomes**

- Improves regional education system's academic standing and national image
- Creates opportunities for new business development
- Retains talented graduates from local institutions
- Revitalizes highly motivated regional workforce
- Cultivates region's economic development

**Cost of inaction**

K-12 schools continue to perform poorly. The region maintains the negative image of "Walking through the muddy waters of gaming" (quote from a stakeholder interview) and fails to capitalize on local academic institutions to lead a new economy for the region.

---

Proposed owner and stakeholders	Suggested resources needed
<p><b>Owner:</b></p> <ul style="list-style-type: none"> <li>• Washoe County School District</li> <li>• Board of Regents</li> <li>• State of Nevada</li> <li>• Chamber of Commerce</li> </ul> <p><b>Stakeholders:</b></p> <ul style="list-style-type: none"> <li>• Residents of the City of Reno, City of Sparks, and Washoe County</li> <li>• Private sector</li> <li>• EDAWN</li> </ul>	<ul style="list-style-type: none"> <li>• Funding/support for the TechHUB</li> <li>• Financial and staff support for Washoe County Schools' Five Year Strategic Plan from the state, public and private sector</li> <li>• Funding for near-term recommendations</li> </ul> <p><b>Cost estimate:</b> High: Large financial investment from the state</p>

---

Recommendation 5: Invest in your people (continued)	
Dependencies	Key milestones, activities and timeframe
Sustainable funding model	<ul style="list-style-type: none"><li>• <b>Immediate:</b> Launch the implementation team and develop partnerships across businesses, academic institutions and local jurisdictions</li><li>• <b>Three months:</b> Publish a set of KPIs to align higher education with economic performance</li><li>• <b>Three months:</b> Assess near-term higher education tactics</li><li>• <b>Six months:</b> Deploy near-term higher education tactics</li><li>• <b>Nine months:</b> Complete agreement and plan for downtown TechHUB</li><li>• <b>12+ months:</b> Assess higher education alignment with economic performance against KPIs</li><li>• <b>12+ months:</b> Complete near-term tactics and begin to assess and deploy long-term tactics</li></ul>
Priority	
High	

# 5. Conclusion

**The region will achieve sustainable economic development if it commits to collaboration and business-friendly practices. It should leverage its location as a supply chain hub, its dedicated workforce, and academic and natural assets. It must engage constituents to gain support for a strong regional vision, identity and brand.**

A system of systems and strong governance model will empower the region to make fact-based decisions, which will improve public services and attract, retain and grow business. This will help to move the region forward on its journey toward revitalization.

For long-term economic sustainability, the region should invest in education and workforce development to prepare today's citizens for tomorrow's jobs.

Strong governance and informed decision-making, combined with robust communications and measurement, will spur long-term economic growth.







# 6. Appendix

## A. Acknowledgements

Name	Organization	Title
Kris Wells	AT&T	Area Manager, External Affairs
Mike DuPont	AT&T	Area Manager, OSP PLNG & Eng Design
Randy Brown	AT&T	Regulatory and Legal Affairs Manager
Scott Rabindeau	AT&T	Area Manager, Outside Plant Engineering
Ty Shalley	AT&T	Systems/Technical Support
Brian Bonnenfant	Center for Regional Studies, University of Nevada	Manager, Center for Regional Studies
Eugenia Larmore	Center for Regional Studies, University of Nevada	Program Manager
Christi Quartro	Chamber of Commerce	Community Affairs
Rickey Boucher	Charter Communications	Manager, Technical Operations
Chad Leigh	Charter Communications	Manager, CB Fulfillment
Tom Nelson	Charter Communications	Manager, Engineering
David Dehls	Charter Communications	Manager, CB Fulfillment
Joe Chambers	Charter Communications	Manager, Sales Major Accts
Patrick Lynch	Charter Communications	Sales Engineer Manager
Terri Weldon	Charter Communications	Government Relations Manager
Alex Woodley	City of Reno	Code Enforcement and Business Licenses Community Development
Bill Thomas	City of Reno	Assistant City Manager
Claudia Hanson	City of Reno	Planning and Engineering Community Development
Dan Leatham	City of Reno	GIS Analyst
Daniel Johnson	City of Reno	Information Technology Manager
Eric Simonson	City of Reno	Chief Building Official Community Development
Fred Turnier	City of Reno	Director, Community Development
Jodi Royal Goodwin	City of Reno	Community Development
Kate Thomas	City of Reno	Director, Management and Budget
Kyle West	City of Reno	Safety and Training Manager, HR
Maureen McKissick	City of Reno	Strategic Development Administrator
Michael Chaump	City of Reno	Community Development
Michael Telliano	City of Reno	Code Enforcement Community Development
Robert Chisel	City of Reno	Director of Finance and Administration
Robert Johnson	City of Reno	GIS Tech

Name	Organization	Title
Valerie Johnson	City of Reno	GIS Analyst
Charla Honey	City of Reno Public Works	Engineering Manager, Capital Projects
John Flansberg	City of Reno Public Works	Director of Public Works/City Engineer
Kerrie Koski	City of Reno Public Works	Street Program Manager
Mike Stram	City of Reno Public Works	Collection System Program Manager
Terri Svetich	City of Reno Public Works	Engineering Manager, Environmental
Armando Ornelas	City of Sparks	City Planner
Neil Krutz	City of Sparks	Deputy City Manager
Shaun Carey	City of Sparks	City Manager
Tracy Turner	Community Foundation of Western Nevada	Program Officer
Lindsay Niedzielski	Connect Nevada	Program Coordinator
Michael Dermody	Dermody Properties	Chairman and CEO
Alan Gertler	Desert Research Institute	Interim Executive Vice President for Research
Greg Bortolin	Desert Research Institute	Communication and Government Affairs
Justin Broglio	Desert Research Institute	Public Information Officer
Thomas Jackman	Desert Research Institute	Associate Research Professor, Interim Sr. Director, Center for Advanced Visualization, Computation and Modeling (CAVCaM)
Mary O'Brien	Discovery Museum	Development Director
Dick Bartholet	Downtown Improvement Association (UNR)	Chairman (CY 2013)
Doug Erwin	Economic Development Authority Western Nevada	Vice President, Entrepreneurial Development
Mike Kazmierski	Economic Development Authority Western Nevada	Executive Director
Rick Vandenberg	Formerly City of Reno	Former City IT Director
Doug van Aman	Governor's Office of Economic Development	Regional Director
Karsten Heise	Governor's Office of Economic Development	Technology Commercialization Manager
Dan Oster	NAI Commercial	Vice President
Scott Smale	Nevada Department of Environmental Protection	State EPA Administrator
Sumiko Maser	Nevada Department of Taxation	Assistant Director
Denise Inda	Nevada Department of Transportation	Chief Traffic Operations Engineer
Richard Nelson	Nevada Department of Transportation	Assistant Director of Operations
Bill Welch	Nevada Hospital Association	President and CEO
Chris Bosse	Nevada Hospital Association	Board of Directors Member
Daniel Herr	Nevada Institute of Renewable Energy	Program Manager



Name	Organization	Title
Colin Robertson	Nevada Museum of Art	Curator of Education
Jeff Hardcastle	Nevada State Demographer	State Demographer
Crystal Abba	Nevada System of Higher Education Board of Regents	Vice Chancellor, Academic and Student Affairs
Jason Geddes	Nevada System of Higher Education Board of Regents	Chairman
Linda Heiss	Nevada System of Higher Education Board of Regents	GIS Manager
Bill Anderson	NV Dept of Employment, Rehabilitation and Training	Chief Economist
Brad Woodring	NV Energy	Manager, Economic Development
Carolyn Barbash	NV Energy	Energy Delivery Executive
Matt Gingerich	NV Energy	Professional Land Surveyor
Mohan Inguva	NV Energy	GIS Engineer
Steve Moyer	NV Energy	Chief of Security
Bryan McArdle	NV Institute of Renewable Energy Commercialization	Senior Program Manager
Nicola Kerslake	NV Institute of Renewable Energy Commercialization	Vice President, Commercialization
Bob Shriver	NVA 250	Data/GIS Consultant
Susan Clark	NVA 250	Managing Partner
Sandy Munns	Reno Fire Department	Division Chief
Steve Bigham	Reno Police Department	Certified Crime Analyst
Jennifer Cunningham	Reno Sparks Convention and Visitors Authority	Executive Director of Marketing
James McCluskie	Reno-Tahoe International Airport Authority	Vice President of Planning, Engineering and Environment Management
Tina Iftiger	Reno-Tahoe International Airport Authority	Vice President, Economic Development
Jennifer Ott	Small Business Development Center (UNR)	Graduate Student
Zachary Yeager	Small Business Development Center (UNR)	Graduate Student
Maria Murgolo-Poore	Truckee Meadows Community College	Dean, Division of Business
Jeremy Smith	Truckee Meadows Regional Planning Agency	GIS Planning Analyst
Kim Robinson	Truckee Meadows Regional Planning Agency	Executive Director
John Erwin	Truckee Meadows Water Authority	Director of Natural Resources
Keith Ristinen	Truckee Meadows Water Authority	Engineer
Kim Mazeres	Truckee Meadows Water Authority	Director, Customer Relations
Levi Klieber	Truckee Meadows Water Authority	GIS Analyst
Mark Foree	Truckee Meadows Water Authority	General Manager
Shawn Stoddard	Truckee Meadows Water Authority	Resource Economist

Name	Organization	Title
<b>Greg Mosier</b>	University of Nevada, Reno	Dean, School of Business
<b>Heidi Gansert</b>	University of Nevada, Reno	Special Assistant to President
<b>Rachelle Pellissier</b>	Volunteers of America Northern Nevada	ReStart Executive Director
<b>Chad Giesinger</b>	Washoe County	Senior Planner
<b>Gary Beekman</b>	Washoe County	IT Manager
<b>Katy Simon</b>	Washoe County	County Manager
<b>Kevin Dick</b>	Washoe County	Air Quality/Health District
<b>Laura Schmidt</b>	Washoe County	CIO
<b>Richard Gammick</b>	Washoe County	District Attorney
<b>Tami Cummings</b>	Washoe County	Community Relations Administrator
<b>Amy Cummings</b>	Washoe County Regional Transportation Commission	Senior Planner
<b>Christina Leach</b>	Washoe County Regional Transportation Commission	Assistant Planner
<b>Julie Masterpool</b>	Washoe County Regional Transportation Commission	Project Manager
<b>Tina Wu</b>	Washoe County Regional Transportation Commission	Senior Transit Planner
<b>Kristin McNeill</b>	Washoe County School District	Chief Strategy Officer
<b>Pedro Martinez</b>	Washoe County School District	Superintendent
<b>Ron Radil</b>	Western Nevada Development District	Executive Director

## B. Team biographies



**Lori Victor Feller**  
**Strategy and Transformation Partner,**  
**IBM Global Business Services**

Lori Victor Feller leads the IBM North Americas Organizational Change Management (OCM) practice and is the Public Sector Social Business/Mobile Transformation Executive. In her role as North Americas OCM leader, Lori is responsible for building the OCM offering and community across the US and Canada. As Public Sector Social Business/Mobile Transformation Executive, Lori introduces new ways of working and uses emerging technologies to promote greater innovation, efficiency and effectiveness within federal, state and local government, education and healthcare.

Lori serves as Project and Business Transformation Executive for several programs, including at the US Department of Homeland Security (DHS), US Department of the Army (Army), US Department of Justice (DOJ), National Aeronautics and Space Administration (NASA), Federal Aviation Administration (FAA) and United States Agency for International Development (USAID).

Lori is recognized as a subject matter expert in change management and strategic communications. She advises multiple complex projects and system implementations across the federal, state and local government, and healthcare and education sectors.

Lori is a certified Project Management Professional (PMP®) and a trained facilitator, experienced in guiding large global audiences through complex topics as well as in training others in facilitation tools and techniques.

Lori speaks at numerous conferences on communications and change management. She has contributed to a book, *Chasing Change: Building Organizational Capacity in a Turbulent Environment*; and to a white paper, *What We Know Now: A Look into Lessons Learned Implementing Federal Financial Systems Projects*, published by the IBM Center for the Business of Government.

Lori maintains an active online presence via Twitter and LinkedIn; she tweets regularly on social business, transformation and OCM-related topics.

Follow her on Twitter: @lorifeller



**Randy Kubich**  
**Senior Engineer/Manager for**  
**IBM TJ Watson Research Center,**  
**Fort Worth, Texas**

Randy is a Project Manager for multiple research projects including Smarter Cities and Smarter Commerce. He is responsible for developing strategies and driving research efforts worldwide to create innovative solutions.

Randy is also Project Manager for Deep Thunder, IBM's high-resolution weather forecasting system. He is responsible for customer requirements, cost assumptions and providing the infrastructure needed for delivery. In 2012 Randy received a Research Division Award for his efforts on the "business of weather."

Randy is Project Interface for the Energy Efficient Buildings (EEB) joint development project among industry (IBM), academia (Penn State University) and government (Department of Energy). This program gives IBM researchers the opportunity to develop innovative solutions that will optimize building retrofitting and reduce costs.

Randy has had many positions at IBM including Mechanical Engineer, performing shock and vibration testing on IBM Mainframe products; Product Engineer for IBM RISC/6000, focusing on customer satisfaction and quality, for which he achieved a Division Quality Award; and Manager of IBM Shock/Vibration, Acoustics and Electro Magnetic Conductivity Labs (Rochester, Austin and Poughkeepsie). This cross-divisional role led to an assignment with the Systems and Technology Group – Integrated Portfolio Management Team (IPMT). IPMT is the IBM Executive Management team that controls development spending while monitoring project progress.

Randy first joined IBM Research as part of the team that developed and delivered the first BlueGene system – the world's fastest computer that won the first "chess game." Randy was also Operations Manager for the Digital Convergence team, which developed and deployed 3D Internet (Second Life) solutions. His responsibilities included managing payroll, travel, capital, contractual agreements and client/vendor engagements.

Randy has served on the Executive Board of Directors for the Williamson County (Texas) Habitat for Humanity, as past President of The Plantation Home Owners Association and as Chair of the Architectural Control Committee.



**Dr. Alexey Ershov**  
**Director, Business Performance**  
**Services, Growth Markets and Japan,**  
**Shanghai, China**

Dr. Alexey Ershov's team is a part of the global IBM corporate organization focusing on improving IBM's strategy and business performance through business analytics.

Before moving to Shanghai in 2011, Dr. Ershov spent three and a half years in Moscow, Russia, where he led the IBM Business Performance Services team in Europe. He started his IBM career in 2004 at IBM global headquarters in the USA.

Prior to joining IBM, Dr. Ershov was a management consultant at McKinsey & Company in the USA. He was also a postdoctoral research scientist at Harvard University, working at Fermi National Accelerator Laboratory near Chicago.

Dr. Ershov received a PhD degree in experimental elementary particle physics from Harvard University in 2001 and a Bachelor's degree in physics from Moscow Institute of Physics and Technology in 1996.



**Easwaran K. Venkatasubramanian**  
**Director Global Funding, Investments**  
**and Foreign Exchange**

Easwaran leads the capital markets and foreign exchange operations for IBM Corporation in New York. He is responsible for investing IBM's surplus cash, stock buyback, foreign exchange operations, raising short- and long-term debt, hedging activities and other front-office tasks. Easwaran came to IBM through the acquisition of IBM Daksh.

Easwaran was Director for Treasury Transformation and Operations, where his responsibilities included US treasury operations, global banking relationships, treasury transformation and being CIO for the treasury group.

Previously, Easwaran had roles managing country treasury and corporate development, wherein he established the Venture practice in one of the IBM growth markets.

Easwaran's background is in finance and he has cleared his Chartered Accountancy and Company Secretaryship courses in India. He is also a CFA charterholder. He has a keen interest in teaching and is the honorary dean of the Treasury University within IBM. He is also an instructor for the IBM Trusted Business Advisor I course and has conducted classes both in the US and outside.



**Massimo Leoni**  
**Distinguished Engineer,**  
**IBM Executive**

Massimo is a technical leader in security and infrastructure design in the Sales and Distribution organization supporting the Systems and Technology Group. He is well known for his technical leadership and work with leading-edge financial and banking institutions in Italy and Europe. He has a responsive approach to working with clients that consistently delivers results by aligning technology initiatives with IBM business goals. His approach leads to substantial innovation and customer satisfaction because of the quality of the solution delivered.

He has strong technical and business qualifications and an impressive track record: more than 20 years of hands-on experience in solution design, security, infrastructures, team development, project management and systems engineering strategies. He has a proven ability to successfully analyze an organization's critical business requirements, identify weaknesses and potential opportunities, develop innovative and cost-effective solutions to enhance competitiveness, increase revenues and improve customer service.

Massimo serves as the lead STG Client Technical Architect for Smarter Computing in the financial and banking industry. He is responsible for design, deployment and implementation of Smarter Computing in Italy, driving innovative infrastructure and cross-brand solutions into key clients who are executing the Smarter Computing strategy.

Massimo coordinates across IBM business units and leads identification, architecture and implementation of complex and innovative business partnerships. He creates new reference architectures, which enable rapid and cost-effective replication of the capabilities to other clients.

## C. References

- 1 *USA Today*. 11 August 2012.
- 2 *Journal of Data Warehousing*. Volume 6, number 3, summer 2001.
- 3 “Opening up government: How to unleash the power of information for new economic growth.” IBM Institute for Business Value Executive Report.  
[www-935.ibm.com/services/us/gbs/thoughtleadership/ibv-open-government.html](http://www-935.ibm.com/services/us/gbs/thoughtleadership/ibv-open-government.html)
- 4 Federal open data policy. [www.data.gov](http://www.data.gov)
- 5 The City of Reno Open Data initiative.  
[www.reno.gov/open](http://www.reno.gov/open)
- 6 “The power of analytics for public sector”. IBM Institute for Business Value (p4). [www-935.ibm.com/services/us/gbs/thoughtleadership/ibv-public-sector-analytics.html](http://www-935.ibm.com/services/us/gbs/thoughtleadership/ibv-public-sector-analytics.html)
- 7 Yijie Zhou, Francesca Dominici, Thomas A. Louis. “A smoothing approach for masking spatial data.” Cornell University Library. <http://arxiv.org/abs/1011.3367>
- 8 “Add more value to CRM with geospatial data.” IBM report. <ftp://public.dhe.ibm.com/software/data/spatial/ngum.pdf>
- 9 “Spatial data warehouses: a survey.”  
[www-users.cs.umn.edu/~smithal/P9.pdf](http://www-users.cs.umn.edu/~smithal/P9.pdf)
- 10 National Information Exchange Model. [www.niem.gov](http://www.niem.gov)
- 11 Aufreiter, Nora A., David Elzinga, Jonathan W. Gordon. “Better Branding,” *McKinsey Quarterly*. Number 4 2003.
- 12 Higher education rates.  
[http://en.wikipedia.org/wiki/Reno,\\_Nevada](http://en.wikipedia.org/wiki/Reno,_Nevada)



- 13 "America's Top States for Business 2012" (Rating of Nevada schools). [www.cnbc.com/id/100013806](http://www.cnbc.com/id/100013806)
- 14 "*Washoe County Five Year Strategic Plan*." Provided by the School District's Superintendent.
- 15 *Reno Sunday Gazette-Journal*. October 3 2010.
- 16 "Momentum for change: The evolution of downtown – Reno TechHUB." (Case statement.)

## D. Data directory

Regional entity	Data type	Notes	Data openness	Business development	Policy making	Small business	Citizen
AT&T	Middle mileage, Backbone, Last Mile telco connectivity	Only Last Mile data is available	P	L	M	M	H
Chamber of Commerce	Private sector affiliated demographic		NA	–	–	–	–
Charter Telco	Connectivity	Can only provide sanitized data	R	L	M	M	H
City of Reno IT GIS	Parcel, demographics, infrastructure	Hosting GIS services for City of Reno	O	H	H	H	H
City of Reno, Community Development Department	Licence data, classification of businesses, many process-based data, demographics, storm and water info	Licence data and others are restricted under privacy policy	P	H	H	H	M
City of Reno, Fire Department	Call data, service time data	Unified patient data in accident for best tracking	O	M	H	M	H
City of Reno, Former IT Director		Move from GIS used for paper maps to analytics	NA	–	–	–	–
City of Reno, Police Department	Call data, crime data		P	M	H	H	H
City of Reno, Public Works Department	Infrastructure and maintenance data, flood data	Restricted under Homeland Security Act. They would like to have access to water info. Can be made available for policy making	R	H	H	H	M
City of Sparks	All data as City of Reno		P	H	H	H	H
Connect NV	Last Mile telco connectivity		O	L	M	M	H
Dermody Properties	Private business real-estate info		R	H	H	H	L
Desert Research Institute	Environmental data		O	L	M	L	M
Economic Development Authority, Western NV (EDWAN)	Private real estate info	80% of the membership could share data	R	H	H	M	L
Governor's Office of Economic Development		Government of NV supports Open Data	NA	–	–	–	–
Hospital Association	History patient data	State available, can be selected for Washoe County	P	L	H	L	M
NAI		Seeking for simulation capabilities	NA	–	–	–	–
NV Department of Employment, Training and Rehabilitation	Economic, tax, demographics	Data has to be sanitized	P	H	H	M	L
NV Department of Environmental Protection	Site cleanup, air quality		O	L	H	L	L

P = Partially restricted  
R = Restricted

O = Data open and available  
NA = Data not available

L = Low interest  
M = Medium interest

H = High interest

Regional entity	Data type	Notes	Data openness	Business development	Policy making	Small business	Citizen
NV Department of Taxation	Tax info	Data has to be sanitized or a specific contract in place for the tax department and local government agency	R	H	H	H	L
NV Dept of Transportation	Signal location, traffic info, bus locator		O	M	H	H	H
NV Energy	Facility location, consumers, electric lines	Restricted data for Homeland Security Act	R	L	M	M	H
NV Institute for Renewable Energy Commercialization	Facility, Usage	Restricted data for Homeland Security Act. Working with DSI to open sanitized data	P	L	M	M	H
NV State Demographer	Data from UN-R		NA	–	–	–	–
NV System of Higher Education, Board of Regents	Graduation rates, student demographics		R	L	M	M	H
REA – NVA 250			O	H	H	H	H
Regional Transportation Commission (RTC)	Bus traffic, demographics	Ongoing open data policy definition	P	H	H	H	M
Reno-Sparks Convention and Visitors Authority (RSCVA)	Visitor demographics and anagraphics	Data has to be sanitized	O	M	H	M	H
Reno-Tahoe Airport Authority	Cargo volumes		NA	–	–	–	–
Truckee Meadows Community College (TMCC)	Student demographics, graduate rates	Data protected by privacy policies	P	M	H	H	H
Truckee Meadows Water Authority	Infrastructure data	No consumer data available	R	H	H	H	M
Truckee Meadows Regional Planning Agency (TMRPA)	Economic, parcel, infrastructure, demographics, water	The data is licenced, not to be shared	P	H	H	H	H
UN-R, Center for Regional Studies	Economic, Land analysis	Data from Tax State Department restricted	O	L	M	M	H
UN-R, Downtown Improvement Agency			R	H	H	H	L
UN-R, University of Nevada (UN-R)	Student demographics	Data protected by privacy policies	O	L	M	L	M
Washoe County	Parcel, demographics, transportation		R	H	H	M	L
Washoe County School District	K-12 demographics and graduation	Data protected by privacy policies	NA	–	–	–	–
Western Nevada Development District	Economics, demographics, tax	Relies on data from UND center for Regional Studies	P	L	H	L	M

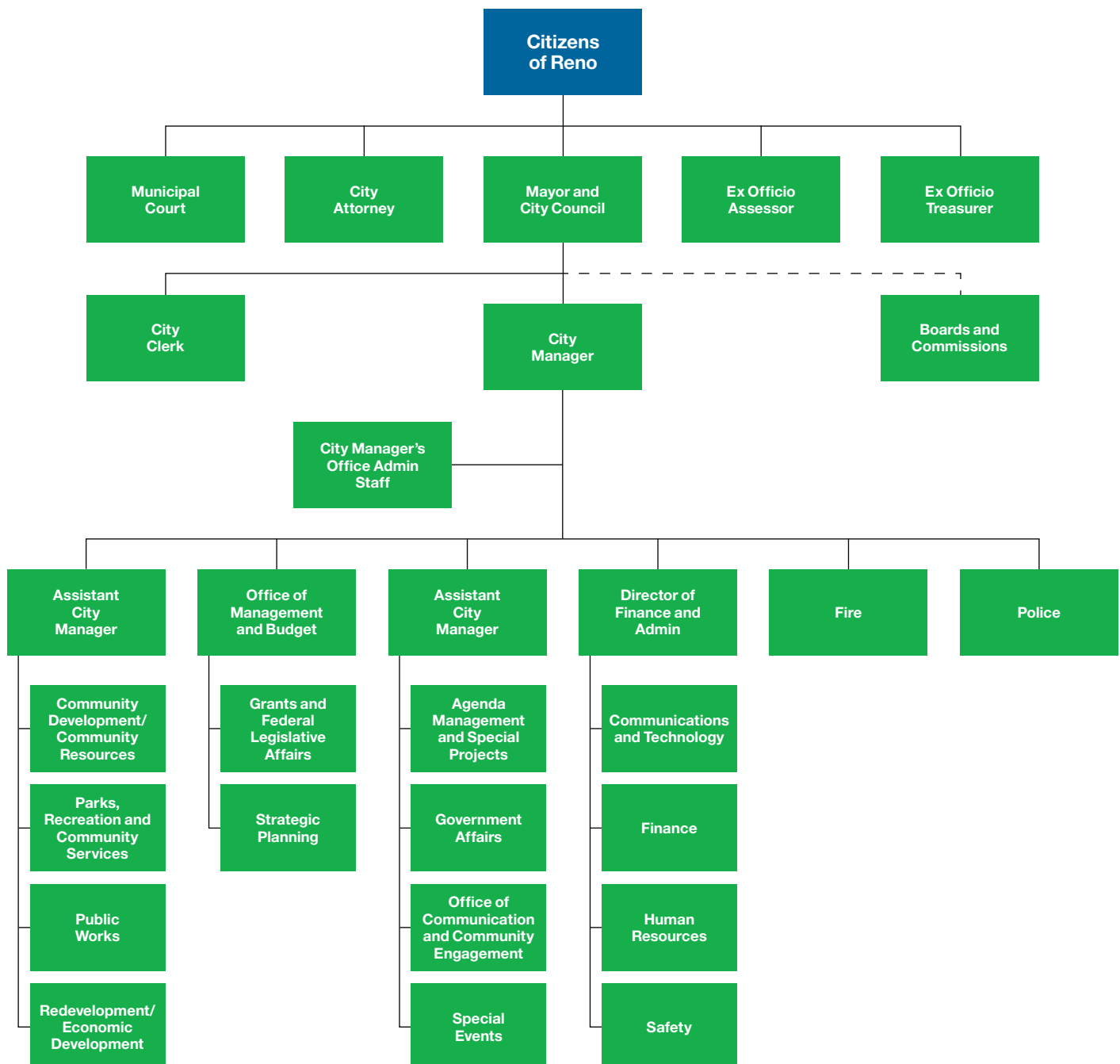
P = Partially restricted  
R = Restricted

O = Data open and available  
NA = Data not available

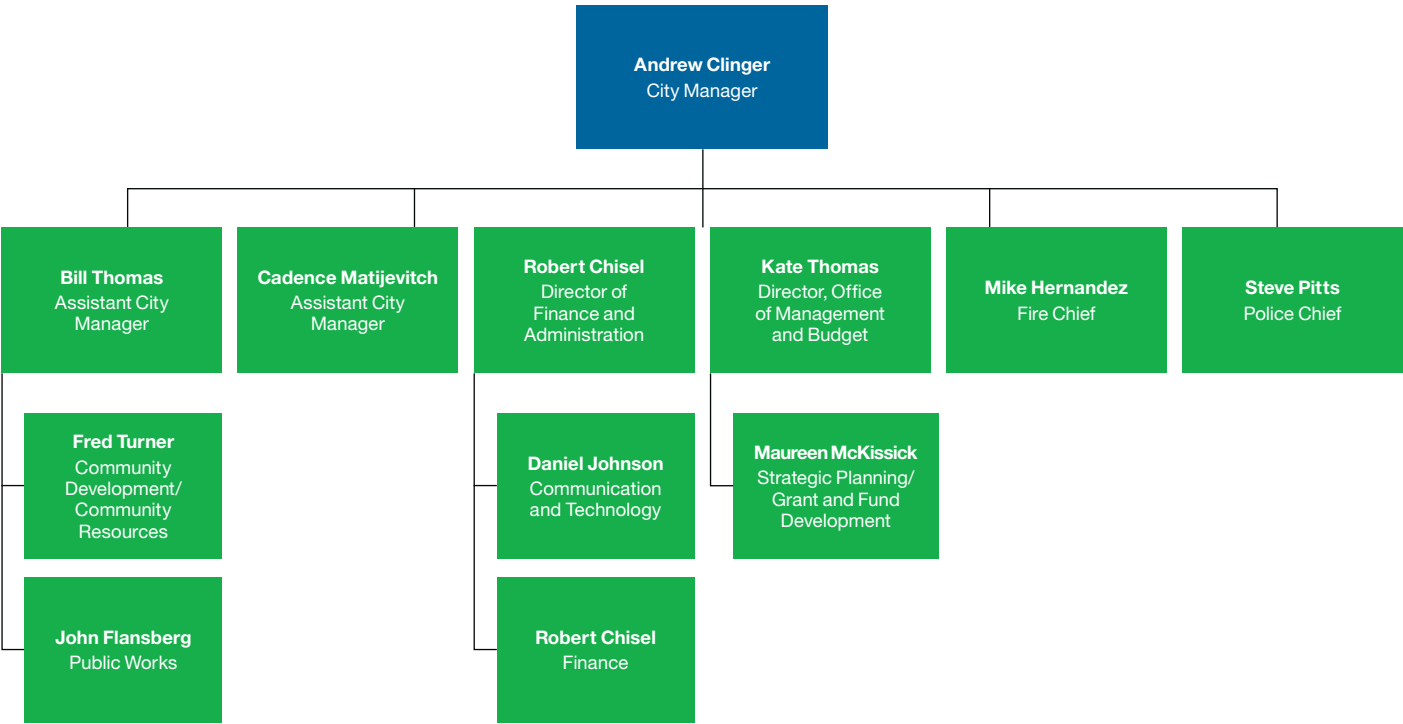
L = Low interest  
M = Medium interest

H = High interest

## E. City of Reno organization



F. City Manager organization







---

© Copyright IBM Corporation 2013

IBM Corporate Citizenship & Corporate Affairs  
1 New Orchard Road  
Armonk  
NY 10504

Produced in the United States of America  
April 2013  
All Rights Reserved

IBM, the IBM logo, ibm.com, Smarter Cities, Smarter Cities Challenge and Smarter Planet are trademarks or registered trademarks of International Business Machines Corporation in the United States, other countries, or both. If these and other IBM trademarked terms are marked on their first occurrence in this information with a trademark symbol (® or ™), these symbols indicate U.S. registered or common law trademarks owned by IBM at the time this information was published. Such trademarks may also be registered or common law trademarks in other countries. A current list of IBM trademarks is available on the Web at "Copyright and trademark information" at: [ibm.com/legal/copytrade.shtml](http://ibm.com/legal/copytrade.shtml)

Other product, company or service names may be trademarks or service marks of others.

References in this publication to IBM products or services do not imply that IBM intends to make them available in all countries in which IBM operates.



Please Recycle

---



