

## Assessing for Smart Cities Readiness

*...Responsible...Healthy...Prosperous*

A city can achieve superior insight and better outcomes across the board when undertaking the necessary projects to become environmentally responsible, healthy, and prosperous.

Before deciding to build a smart city, first we need to know why. This can be done by assessing as many of the city demographics as possible to determine the benefits of such an initiative(s).

A Smart City is one that improves the quality of life by “enabling an environmentally and socially responsible, healthy, and prosperous environment”.<sup>i</sup> This environment is driven by technological, economic, and environmental changes that generate interest in smart cities. These changes are driven by the technology rage that is sweeping the country known as IoT or The Internet of Things. Climate change, economic restructuring, the move to online retail and entertainment, ageing populations, urban population growth and pressures on public finances drive these changes.

Economic restructuring is motivated by urban areas shifting from a manufacturing to a service economy. This revolution has affected employment, specialized services, nonstandard work routines, income distribution, mobility, metropolitan growth, public outlays and, in general, the social order.

Technology is the engine that enables economic restructuring and electronic commerce is its driver. As a result, a popular initiative for cities striving to become a Smart City is the creation of Mobile Data Computer hot spots. It is just one of the initiatives in the Smart Cities Roadmap that demonstrates innovation at work to improve the quality of life. As of 2016, customers can shop online using a range of different computers and devices, including desktop computers, laptops, tablets, and smartphones.

Assessing for Smart City readiness must include the prioritization of initiatives and allocation of resources. Public finance must efficiently allocate these resources while considering economic stabilization based on the distribution of income. This requires a holistic customized approach that accounts for city cultures, city planning, and regulations that meet the citizens’ needs, in order to improve the quality of life and create real economic opportunities.

In short, Technology, Processes, and People are the three tenets of success for a smart city initiative.

A smart city assessment roadmap consists of five major components:

- Define the Current Reality as it relates to the city’s vision for what they would like to accomplish. Develop a policy to drive the initiatives and define roles, responsibilities, objectives, and goals to create plans and strategies on how the goals will be achieved.
- Understand the city’s culture today and agree on what it will look like after the proposed Smart City initiatives are implemented
- Uncover the current reality for the management of existing city processes and plan for how these processes will change
- Understand the change dynamics that will need to be addressed as the chosen initiatives are implemented
- Choose and prioritize the proposed Smart City initiatives based on the benefits they will provide. And recognize that priority differences exist according to the attributes of the different demographic groups.

## Thoughts on Smart City Readiness Assessments

---

Building on the work performed by the Florida Chapter of the US Green Building Council (USGBC), and the associated initiatives to drive Smart City implementation in Florida Cities, the need exists for the development and provisioning of a process to understand the Cities (and their associated departments) readiness to implement the attributes defined within the Smart City framework. The first step towards implementing a successful initiative is to clearly understand the strengths and weaknesses within the current environment and integrate that knowledge into the plan. Further, the ability to track and compare (benchmark) various cities performance toward the initiative will be a powerful and positive reinforcement and knowledge sharing tool (success is contagious).

To perform this work in a cost efficient, accurate, and complete manner, web based assessment tools, and analytics will enhance the ability to help transform municipalities from their current state to a Smart City state. By understanding and discovering city processes and departmental and human resource dynamics, these assessments will enhance the capability to better position technology, services, and techniques to create effective environments leading to achievement for the associated projects and growth for the city. To understand behaviors, patterns and trends, a typical base of questions that will need to be answered include (but are not be limited to):

- Is the city prepared and ready to create and execute a complex transformation?
- Is the description, purpose and expected result for each initiative defined and documented?
- Are the required core technology migrations understood and defined for successful implementation?
- Are the benefits of implementation clearly understood and communicated to stakeholders?
- Are the required Strategic Partnerships defined to assure rapid and efficient implementation?
- Has the environment been created to open minds to a new way of thinking and acting?
- Does the city have an appropriate stakeholder structure that will accept and drive new technology?
- Are resources and technology dedicated to seamless communication of plans and progress?
- Are risks understood and identified for the perception, adoption, or confidence in smart environments?
- Does the city have a vision and long-term commitment to evolving technology?
- Are user and technology requirements formally and regularly reviewed (and at what frequency)?
- Is the city citizen centric (or not) i.e. impacts policy, technology adoption, benefits?

Typical gaps that need to be investigated include:

- Organizational Structure Readiness
- Depth, Breadth and Effectiveness of Communications
- Business Requirements and associated timelines
- Business Processes
- Technology Processes
- Service Processes
- Change and Configuration Management
- Management Team and it's preparedness
- Culture Norms
- Project Management Capability
- Strategic Partner Capabilities

The Smart City Assessment will examine the city's ability to transform its environment and their ability to understand the value of, and accept, new technology innovations. As a function of the data collected, insight will be gained relating to the level of process and planning maturity as compared to best practices and desirable norms. This knowledge dramatically increases the probability of success and reduces risk of failed initiatives due to misalignment, lack of prioritization and / or lack of knowledge. Defining what your city knows and does not know is a logical first step in the evolution of change.

## A Readiness Assessment Tool

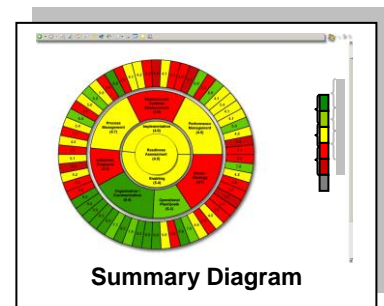
---

## I. Benefits of a Smart City Readiness Assessment

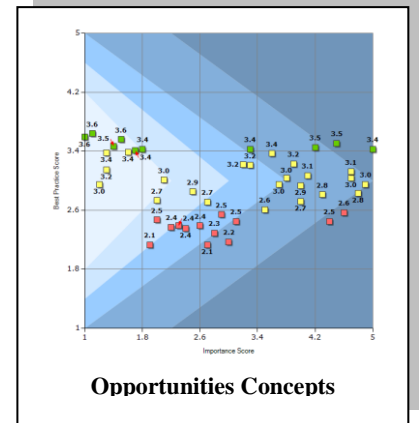
The collection of knowledge through Web-based assessments should be based on Best Practices and Six Sigma principles. They accomplish what is expected when recommending solutions for any business improvement. These advantages include faster, less expensive assessments based on a very large footprint of the application. In addition, the quantified nature of the data is well suited to both internal and external benchmarking. With quantified and standardized data it is possible to make valuable inferences regarding key aspects of the application being assessed.

The basic concept is to provide an in-depth, web-based assessment that uncovers the current reality and has several advantages:

- **Broad Footprint** – The methodology should cover any footprint, up to complete global coverage, in just a few hours. The benefit is that the assessment is smoothed out over many sites and erroneous generalizations based on non-typical sites are avoided. It should be able to connect with a statistically significant base of respondents to achieve an accurate representation of the full targeted population. *For a Smart City, it should be able to cover the fire department, IT, Public Works, The Housing Authority etc. in the same assessment and mix and match analytics as necessary.*
- **Rapid Application** – The methodology should cover many cities or functional groups within a city in a matter of hours once the respondents have been identified – with minimum disruption and downtime.
- **Cost Effective** – By avoiding the expense of an on-site team, the assessment can be administered in a cost effective manner. The favorable cost to benefit ratio allows such assessment events to be conducted with some regularity to accommodate city growth etc. These assessments are particularly useful in establishing the effectiveness of the deployment of new programs and in identifying areas of weakness for remedial measures.
- **Quantifiable Results** – The methodology should contain a detailed structure that rolls up to quantifiable results. By using a core set of Best Practices and structured, scored question sets, *the methodology should create a rich data set that can be benchmarked internally or against other cities or communities.* The data also provides a good baseline to reference progress against. By obtaining results in this manner the assessment avoids the subjectivity of on-site assessment teams and can benchmark results down to the question level.
- **Expanded Scope** – Since the assessment is going out to so many respondents, there is an opportunity to explore areas that are just not feasible via other means. For example, experts say that a consultant team can reasonably cover 30 – 40 interviews in a traditional assessment. With the proper methodology the assessment can cover as many as needed, just by inviting additional respondents with the appropriate experience to participate. Having an assessment cover 100% of the demographics in a Smart City scenario should be common.
- **Expanded Utility** – The methodology should have the ability to drill deep enough to allow the characterization of Strengths and Weaknesses across the respondent population. This knowledge would allow a city to match the remedial solution to the need.
- **Extensive Demographics** – The value of an assessment analysis is based on the demographics tracked for each Respondent and the manner in which it is tracked. The Smart City Assessment should be anonymous and allow an unlimited amount of demographics. The city should work with the assessment company to establish meaningful demographic descriptors in the following relatively orthogonal areas: Organization; Titles; Functions; Location; Products or Processes; Workforce Characteristics etc. Careful thought on this breakdown will yield rich insights.



- **Rigorous Structure** – The Smart City Assessment should be structured in a manner that creates valuable data regarding the assessed city. The following features contribute to a unique methodology: Best Practice Approach; Baldrige Conventions; Diverse Question Structure; Current Reality; Broad Exploration; Opportunities Concepts; On-the-fly Correlations.
- **Vivid Charts** – The Smart City Assessment charts should allow both comprehensive and specific looks at a variety of demographic cuts. Special features such as instant thumbnails would allow continuous creation of “short term memory” during the analysis process.
- **Insightful Reports** – Custom charts and reports should consolidate data and present results in a format that is useful and which leads quickly to remedial actions. One feature that is especially useful is the reporting of all scores next to example policies and behaviors of leading cities. This allows city managers to replicate those example behaviors in areas identified as having sub-par performance. The charts and reports should also allow cities to avoid excess expenses for solutions in areas where pockets of excellence can be identified within the city. An Opportunities Concepts Chart would automatically prioritize necessary actions.



## Assessing Readiness for the Smart City Environment

The example below represents what a typical city might analyze in the process to become a Smart City. This representation is a “snapshot” in time. Smart Cities is a rapidly evolving concept in environmental, socially responsible communities. Therefore, these Categories may change over time. Most cities will keep informed regarding their needs, trends, and technologies, allowing them to stay current and progress with technology changes.

Each category should be **analyzed** to uncover the current reality of that portion of any project to transform to a Smart City Environment and track the progress toward that goal

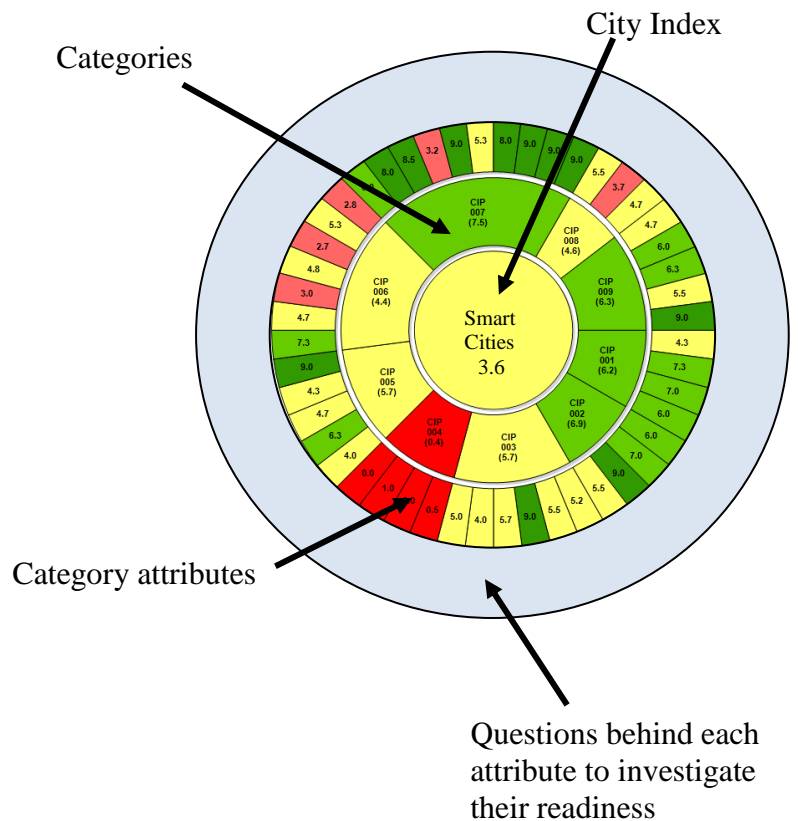
Appropriate questions for specific team members in each category for each portion of the project should be developed in collaboration with the city or the USGBC to establish a final configuration

Demographic Selections, Respondent Types, Importance Traits, and the Question Response Matrix matching questions to project team members etc. will be accomplished in collaboration with Smart City Experts.

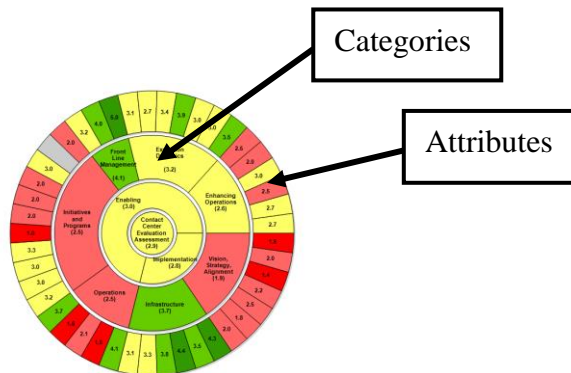
Program Index: A quantitative score for the entire program determined by the scores of the individual Categories

Category Index: A quantitative score for a specific category determined by the scores related to the various attributes

Attribute Scores: Determined by assessment Stakeholder input



Develop an assessment that will be used to baseline specific disciplines in a city's physical environment.



Below, are examples of some proposed categories and some of the proposed attributes that might be investigated to accomplish the objective. Appropriate attributes and questions for each attribute would be developed by the assessment partner in collaboration with subject matter experts to establish a final configuration; Demographic selections, Respondent Types, Importance traits, Question Response Matrix etc.

**Category: Vision Strategy & Alignment Attributes**

- Are Initiatives Defined, Documented and Communicated?
- Is there a description/purpose for each initiative?
- Does the City have policies and budget to promote new technology?
- Is there a documented vision and long-term commitment to evolving technology?
- Is feedback from citizens regularly and formally captured? (i.e. impacts policy, adoption, benefits)
- Are the risks around perception, adoption, or confidence in smart environments understood and considered in planning?
- Do leaders have the training and tools to be proactive and empowering to help create a Smart City Environment?
- Do leaders and employees have the tools and training to enable the city to create a complex transformation?
- Are Strategic partnerships defined, established, and understood?

**Category: Organization & Communication Attributes**

- How effective is the level of communication within the city environment?
- Are levels of communication clear and in sync with the process and city needs?
- Is new technology recognized as an opportunity by the people managing the city processes?
- Are the city employees and management equally engaged with the creation of a Smart Environment?
- Does the city have the proper stakeholder structure to assure acceptance of new technology?
- Are stakeholder's committed to the creation of a virtual environment?
- Do Project Management basics exist that will contribute to successfully completing the task?

**Category: Process Management Attributes**

- Are business and technical processes defined and documented?
- Are the core technologies required for successful Smart City implementation defined?
- Is a Change Management process defined?
- Is a Project Management process defined?
- Are processes staffed with knowledgeable professionals capable of driving change?
- What process areas are weak and / or problematic?
- Are the process stakeholder's rolls identified?
- What will be the effect on processes during the new technology implementation?

- Is process performance measured and understood?
- Are the following departments engaged and planning for Smart City implementation?
  - Economic Development
  - Emergency Management
  - Public Works
  - Housing Authority
  - Transportation
  - Engineering
- Is process data used to drive continuous improvement?

} Typical Process Areas

**Category: Change Mechanics Attributes**

- Is management’s roll in the Smart Environment initiative defined, understood, and rewarded?
- Are city employees trained and empowered to understand the smart environment concept?
- Does IT have the authority they need to initiate and facilitate change?
- Do city departments understand the change/release dynamics within their environment?
- Does the city reward positive change behavior?
- What are the roles of staff?
- Are there regular and reinforcing communications to minimize resistance?
- Is there a risk management and mitigation strategy?
- Are Smart City stakeholders identified and active in the planning and deployment process?
- Is there a structure for introducing new concepts?

**Category: City Culture Attributes**

- Is there a problem prevention and resolution plan?
- Does the city understand their employee behaviors?
- Is there a decision making process identified?
- Is the city program management team strong enough to manage any risk associated with the creation of a smart environment?
- What are the benefits of implementing the Smart City initiative (to the City, citizens, etc.)?
- Is there a training plan to keep the employees technology savvy?
- Is HR respected and utilized properly?
- Is there a structured approach to problem solving?

**Category: Innovation Attributes**

- Are user and technology requirements formally and regularly reviewed (and at what frequency)?
- Is there a plan for putting ideas into action?
- Do IT systems enable new ideas and innovations?
- Is idea sharing rewarded?
- Is there a process for Idea generation and management of those ideas?

**Category: Environmental Maturity (IT)**

- Is IT Systems Support a business process?
- Are there IT Systems Support cross functional process teams?
- Are IT Systems flexible?
- Is information from multiple sources readily available?
- Are transformation timeframes realistic, understood and in line with city requirements?

**The Calc Report**

A Calc Report is, a separate “chart” that reflects the results of numerical responses. This amounts to analytics that sit on the platform and provide statistical results. Questions with numerical responses are asked and the answers are used in formulas to calculate results.

A Smart Cities Readiness Assessment should position the need for improvement and offer strategic impressions for remediation solutions. In addition, it should assist management in their focus on channeling investment into areas that have the largest potential for immediate and significant ROI and the reduction of risk.

In collaboration with subject matter experts, the assessment partner should help to assemble, document and upload respondent demographics, categories, factors, and specific questions (numeric, radio, multiple choice, and Open Ended as required).

The assessment technology should aid in providing insight and strategies that will help a city understand their “current reality” and enhance implementation of the Smart Cities concept.

For the best possible results when assessing a city for Smart City Readiness: Collect **Real Data** from the **Right People** about **Real City Infrastructure Issues** in **Real Time** and use **analytics that match the task**.

## About the Author:

Michael St. Angelo is the President and CEO of NeuraMetrics Inc. Mike has held executive sales and marketing positions at a company that was the worldwide leader in process automation, an industry analysis firm that studied and advised major corporations and utilities and a company that marketed enterprise software. He has led the development of an efficient and robust method to conduct mission critical, process and organizational assessments, benchmarking and analysis. His methodology and tools offer expanded insight into causes of organizational performance including analysis of process behaviors. Mike has taught undergraduate courses and provides freelance articles occasionally for industry publications.

## About NeuraMetrics Inc.

---

NeuraMetrics was formed in Jan 2004 as a Florida Corporation. They collaborate with subject matter experts, serve as a co-developer/packager of the content, and host the assessments they develop. These assessments consist of broad, comprehensive surveys and a unique display/analysis application called NeuraTool™.

The NeuraMetrics concept and methodology has been validated (independently) via a popular book (“The Wisdom of Crowds,” James Surowiecki) and a cover story in BusinessWeek (“The Power of Us”). It is clear that the concept of web enabled broad collaborative activity and the harvesting of corporate human intellectual capital are emerging trends driven by web-based technologies such as IoT or The Internet of Things.

### Areas they have worked in for a broad range of companies and municipalities:

- Power Plant Security
- Smart Grid Utilities Assessments
- Internet of Things
- Manufacturing Plant Security
- Six Sigma Readiness
- Six Sigma Deployment
- Factory Automation (process control)
- Supply Chain Risk Management
- Personal Effectiveness (360 assessment)
- Culture
- Wellness
- Call Center Operations

- Vendor Management & Oversight
- Software Development Maturity
- New Product Development
- Rapid Assessment for Product & Technology Development
- Demand Creation and Sales Effectiveness
- Customer Satisfaction (Help Desk Evaluation)
- Voice of the employee
- Voice of the customer
- Benchmarking (Internal and External)
- Business Process maturity
- Others

Mike St. Angelo may be contacted at:

Office: (904) 246-9733

Cell: (904) 631-7879

[mstangelo@neurametrics.com](mailto:mstangelo@neurametrics.com)

---

<sup>i</sup> US Green Building Council Florida Chapter