A Comparative Analysis of Engagement Methodologies in Community Resilience Initiatives

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A Comparative Analysis of Engagement Methodologies in Community Resilience Initiatives

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A Thesis in the Field of Sustainability

for the Degree of Master of Liberal Arts in Extension Studies

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Abstract

Millions of dollars, not to mention invaluable community trust and energy, are wasted every year on ineffective community redevelopment programs and projects that fail to live up to their goals due to lack of community buy-in. Community organizations have begun to acknowledge the shortcomings of conventional engagement methodologies, but a lack of solid data on the benefits or long-term efficacy of differing engagement methods has left a critical gap at the question of how and why to invest in one engagement method over another. Given the considerable expense and importance of effective engagement to community resilience, my research sought to analyze the variables that influence successful local-level engagement and outcomes for community resilience initiatives and provide practical, relevant, and implementable engagement guidance for those on the front lines of community resilience. Striving to fill the gap between the 'why' of engagement to the 'how,' I explored the question of which engagement methodologies are demonstrably most and least effective by testing the hypotheses that: 1) the perceived overall levels of the variables of "shared values" and "trust" in a community would correspond positively with the efficacy of project-specific community engagement efforts; 2) the more investment organizations made in ongoing, transparent communication, and the more varied and overlapping those forms of communication were, the greater the sense of "trust" and "shared values" community stakeholders would have; and 3), engagement strategies based on the shared values of a

given community, such as financial security, personal health, or social connectivity, would prove most effective.

In order to test these hypotheses, the Envision sustainable infrastructure assessment tool was used as a framework to undertake a comparative analysis of the data presented in reports by cities participating in the United Nations Office for Sustainable Development (UNOSD) Voluntary Local Review (VLR) process. Representativeness was established by including reports submitted to the UN in 2021 from distinct geographic locations, histories, and social structures, and the analysis considered the general maturity of the initiative and/or the experience of project leadership with similar initiatives.

My analysis achieved the goal of categorizing engagement methodologies in the resilience sphere, determining that the most effective engagement methodologies for community resilience initiatives do appear to be based on the shared values of a community and providing a list of best practices to consider when designing and implementing resilience initiatives. It became evident that organizations should plan to build exploratory actions and activities into the earliest stages of resilience initiatives to discover and successfully establish authentic and transparent lines of communication between participants and organizers, identify shared values and sources of or threats to trust, and thus increase community receptiveness and eventual program success. Further, it highlighted the value of the Envision framework for use in the evaluation and refinement of all manner of programs and projects and provided follow-on research opportunities in the development of an interactive, algorithmic tool for data-tracking, knowledge-sharing, and capacity-building between communities.

Acknowledgments

I would like to extend my deepest, heartfelt thanks to my thesis director, Kimberly Post, for her passion for community engagement and her incalculably beneficial guidance, support, and feedback on the academic journey that has been this thesis. I would like to thank Dr. Mark Leighton for his inspirational and uplifting approach to academia, sustainability, and life in general, which helped me believe in myself and work through my trepidation of the thesis process. I would also like to thank Cristina Contreras Casado and Judith Rodriguez for introducing me to Envision and making my sustainability journey that much more meaningful and fulfilling!

Most importantly, however, I would like to thank my family. To my dearest children, Kya and Archer, especially, I know it has been rough at times over the last few years, dealing with my late nights and early mornings and the times when I became a stressed-out, grumpy mama bear. Thank you for sharing your hugs, your smiles, your understanding, and your encouragement. Archer, there is almost nothing in the world that one of your surprise charcuterie boards won't fix! Kya, your compassion and kindness are deep beyond your years, and I am so proud of you. You have both given me so much, and I hope this experience has helped you embrace how amazingly, perfectly imperfect we all are. Thank you for helping me maintain my sanity, and now, finally, Mama just might have a little more time to play video games with you.

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Chapter I

Introduction

Millions of dollars are wasted every year on ineffective community redevelopment programs and projects that fail to live up to their goals due to lack of community buy-in. As a community resilience professional with almost two decades of experience, I have seen this happen over and over at local, state, and federal levels. A well-intentioned program is set up, but the community is not effectively engaged. Either consultations only manage to engage a tiny fraction of the community, or community input is disregarded, or sometimes a community is not engaged at all. No matter the reason, when the community does not feel authentic ownership of a program, the program fails and it is not only a waste of funding, but also massively detrimental to community trust and energy – momentum that can take years, even decades, to recover. At present, community development organizations have begun to acknowledge the shortcomings of conventional engagement methodologies, but there is a lack of specific, implementable, data-driven guidance as to how to do it any better.

Community resilience practitioners currently searching for guidance on more effective engagement methodologies will find a plethora of theoretical and anecdotal information. Engagement tip sheets and recommendations from government working groups (ICMA, 2014), universities (PSU, 2020), and front-line organizations (Community Places, 2012) are widely available. These documents, as well as the peer-reviewed literature on which they are based, quite thoroughly detail the reasons why effective community engagement is so critical, and even suggest general approaches

known to improve outcomes, such as holding community meetings at different times of day or trying new forms of interaction outside of traditional meetings.

The current literature, however, stops short of quantifying the real costs or long-term efficacy of differing engagement methods, leaving a critical gap at the question of how and why to invest in one engagement method over another. At the strategic and operational levels of community organizations in which my colleagues and I work, where both time and funding are severely limited, this lack of solid, evidence-based data has led to uncertainty and indecision and a reluctance to try anything deemed new or risky, even when conventional practices are clearly not producing the desired results.

Research Significance and Objectives

My research sought to analyze the variables that influence successful local-level engagement and outcomes for community resilience initiatives and provide practical, relevant, and implementable engagement guidance for those on the front lines of community resilience, from federal agencies to grassroots organizations. I believe such data will prove especially valuable to state and federal agencies, as they are currently attempting to pivot from their historical top-down approach to a more authentic model of community engagement.

My research objectives were to:

- Determine the most effective and efficient engagement methodologies for community resilience initiatives.
- Compare the expectations of engagement practices to the realized benefits and categorize methodologies by efficiency, efficacy, and longevity.

- Present information in a simple, streamlined format that will assist those working in community resilience, from government agencies to community non-profits, to spend less time, energy, and money while achieving more effective outcomes.

Background

Community resilience refers to the ability of any given community to process, adapt to, and learn from adversity and stress (Patel et al., 2017; Towe et al., 2014). Since adversity and stress are unavoidable facts of life, from extreme events such as natural disasters and violent insurrection to the more mundane ups and downs of financial markets or local politics, resilience is the ability of a community to exist as a definable community at all. Community development projects focused on improving resilience therefore impact nearly every aspect of daily life – including public health, socioeconomic well-being, governance, community connectivity, and environmental concerns (Figure 1), and constitute an enormous potential benefit for individual communities and society at large (ICOR, 2021; Patel et al., 2017).

Historically, singular focus was placed on resilience as the ability to withstand or rebound from disasters. Since the late 1990s, however, researchers and practitioners have been building a body of evidence proving that resilience represents the basic building blocks of a healthy, thriving community, in good times or bad (Patel et al., 2017; Towe et al., 2014; Uscher-Pines, 2013). This newfound understanding brought with it the realization that resilience cannot be bestowed upon a community by a bureaucracy, nor does resilience begin only when fires are burning at doorsteps or political instability tips over into violence. Resilience initiatives must be undertaken continually, holistically, and

with the support and active engagement of community stakeholders (Dubowitz et al., 2015; Ellis & Abdi, 2017; Towe et al., 2014).

Figure 1. The myriad impacts of community resilience initiatives (ICOR, 2021).

The Evolution of Community Engagement

As with resilience itself, there has been a tendency for community engagement – strategies for working with diverse yet interconnected stakeholders to uncover, prioritize, and resolve community issues – to be seen as something that is only relevant in times of crisis (Baybay & Hindmarsh, 2018; DeWeger et al., 2018; ICMA, 2014; Phillips et al., 2016). Authentic engagement, however, cannot begin only when an organization wants or needs something specific from a community, or vice versa.

Available research on community engagement in the resilience sphere, which covers topics as diverse as bushfire mitigation, public health, extractive industries, extremist violence, and sea-level rise, makes abundantly clear that the most disaster-resilient communities are those able to authentically engage differing stakeholders for a common purpose outside of dire circumstances (Baybay & Hindmarsh, 2018; DeWeger et al., 2018; Ellis & Abdi, 2017; Kougiannou & Wallis, 2020; McLennan et al., 2019; Wang et al., 2016).

Phillips et al. (2016), for example, make a case that an ongoing arts program can be an effective engagement technique to increase bushfire resilience, by building on the shared values in the community to develop deeper levels of trust – a reciprocal understanding and expectation of motivations, capabilities, and reliability – between community members and first responders. For this particular study community, the most important value shared by all stakeholders was social connectivity, or the ability to meaningfully and enjoyably interact with one another. For other communities, a shared value might be financial security – evidenced when residents place great importance on the ability to protect family-sustaining jobs or support community businesses – or a strong shared desire for personal health and well-being, a commitment to social justice and activism, or a focus on environmental protection. Shared values can take many forms based on the history and culture of a community, but they are the principles and priorities that both help to define and are defined by the character of an area and could be considered the very backbone of a community's identity (Lerch, 2017).

Nurturing an atmosphere of trust and celebrating shared values have not always been the goal of community engagement, however. For much of the last century, and

even still in some instances today (Kougiannou & Wallis, 2020; Uscher-Pines et al.,

2013), community engagement really meant "getting people to do what we want."

Following the mentality of most fields in the twentieth century, community engagement

meant informing or educating (Booth, 2013), often assuming that residents were too

ignorant to know or understand their own needs, much less take part in decision-making

or solution implementation. Directives were handed down from on high, and

communities were expected to follow the expert advice and guidelines they were given.

Any failed community initiative was laid squarely at the feet of the community, with the

assumption that community members either did not understand the directives or chose not

to comply. Experts and professionals rarely took any responsibility for poor program

performance.

Near the end of the twentieth century, attitudes began to change slightly. While

some earnest research was underway on what had or had not been working, among

practitioners there was more a shift in practice, rather than a true change (Aslin & Brown,

2004; Cayave, 2004). Experts and agencies began to accept that community members did

not particularly appreciate being lectured to, and it was decided that a softer touch was

needed. Marketing and persuasion took center stage. Residents were still largely

considered unable to decide for themselves what their issues were or how to solve them,

but now consultants became proficient in community workshops and planning charettes.

In these engagement environments, a carefully curated group of community

representatives, oftentimes selected because they were deemed the most like-minded or

compliant (Mayes et al., 2014), was given the illusion of control by being asked for their

input on a small number of potential solutions for an identified problem.

From 2000 to 2015, a large body of work was released and built upon, speaking to the importance of authentic engagement, where community members are made an integral part of a program from the beginning (Carr-Hill & Street, 2008; Chadburn et al., 2013; ICMA, 2014; McCloskey et al., 2014; Uscher-Pines et al., 2014). Statistics claiming that 70% of change initiatives fail, largely due to a lack of participant buy-in (Conner, 2012), as well as front-line experiences with one failed or underperforming project after another, underscored the reality of the researchers' findings. Organizations began to embrace in earnest the need for authentic engagement. Communities, however, had been lectured to and manipulated time and again, over a period of decades, and trust was in short supply (Kohler-Hausmann, 2021; Kougiannou & Wallis, 2020).
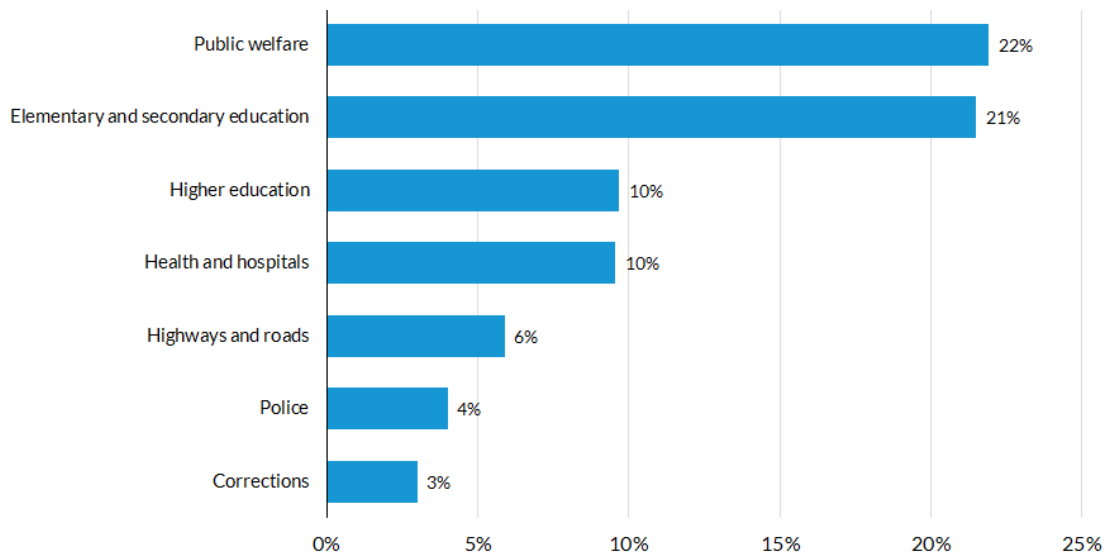
Source: State & Local Government Finance Data Query System, http://www.taxpolicycenter.org/slf-dqs/pages.cfm, The Urban Institute-Brookings Institution Tax Policy Center. Data from U.S. Census Bureau, Annual Survey of State and Local Government Finances, Government Finances, Volume 4, and Census of Governments. Date of Access: (04-Feb-2020 2:30 PM).

Figure 2. US state and local direct general expenditures, by functional category, as a percentage of the $3.1 trillion spent in fiscal year 2017 (Urban Institute, 2020).

That legacy of broken trust continues to challenge resilience initiatives, and genuine attempts at engagement, even today. Though hundreds of millions of dollars in both private funding (FDO, 2021) as well as local, state, and federal public funding (Figure 2) are spent every year on resilience initiatives – projects focused on areas such as access to health and human services, education, and infrastructure – the last two years have highlighted how far our global society still is from being truly resilient, and how disengaged and disenfranchised community members feel (Kohler-Hausmann, 2021).

The Current Reality: A Choice Between Ineffective and Unproven

Organizations and resilience practitioners have been stuck in a cruel catch-22, knowing full well, from both research and first-hand experience, that existing methods of engaging with community members is ineffective, but unable to find the solid, data-backed rationale to convince boards and funders to support trying something new. Current research does not delve into the actual costs involved in the many engagement methods recommended, nor does it provide measurable, replicable outcomes, instead relying on anecdotal results such as interview responses or perception surveys. For communities, organizations, or policymakers – especially slow-moving and risk-averse bureaucracies – to accept and utilize specific engagement methodology recommendations and build genuine, long-term resilience, there must be solid supporting data and a clear understanding of costs and benefits.

Due to this lack of supporting data, currently defined engagement methodologies can be grouped into two general categories: safe and risky. "Safe" methodologies are those which have been used for decades, were presumably effective at some point in time for someone, somewhere, have easy-to-follow processes and procedures, and are

perceived as having known, minimal costs. The most common "safe" methodologies are community meetings, focus groups, and surveys, which are measured in terms of number of participants, but almost never critically analyzed for appropriateness, inclusivity, or statistical significance.

"Risky" methodologies are those that may or may not have a history of use and success, but do not have easy-to-follow processes and procedures and do not have known or minimal costs. Almost anything that is not a traditional meeting or survey of some kind falls into the "risky" category for most community organizations. Interactive or art-based engagement, especially including games, participatory design, photography, public murals, written stories or performing arts, are often recommended by both researchers and consultants (Community Places, 2012; Mattern, 2020; Phillips et al., 2016) as effective at building on shared values and developing a sense of trust both within the community as well as between organization and community members. Unfortunately, in my own experience as well as many of my colleagues, they fall into the "risky" category in practice due to their higher upfront costs and lack of quantifiable success.

The concept of cost is an overarching priority for those making the resource allocation decisions for community projects, but the focus is generally on short-term, upfront prices for materials and labor, rather than on the long-term value of the project. Indeed, very little long-term tracking or measurement of the true costs or benefits of resilience projects is done, especially in small organizations. A common occurrence is one often seen with community gardens. With little more than feedback at a poorly attended community meeting or a handful of responses to a community survey to guide their work, an organization is concerned that a community is unhealthy and/or food

insecure and decides the solution will be greater access to fresh, healthy food. The organization finds funding based on the popularity of community gardens, despite their dismal long-term success rate (Bleasdale, 2011), and rallies a smattering of volunteers to help one or two staff members to design, construct, and implement a community garden program and train community members on gardening techniques and food supply management. The organization wipes the dirt from its hands, pats itself on the back for a job well done, and walks away. Several years later, the organization returns to check in on their successful garden program and is surprised to find it abandoned or barely functioning. The organization scratches its head, then consoles itself with the knowledge that it did the best it could, and…tries the same strategy again, in another community.

The problem with this scenario – which is a continuing problem for many community resilience organizations, whether they are attempting to start their own initiative or learn from past projects – is that neither the cost nor the value of the project was appropriately considered or measured. Critically, the project failed to appropriately and effectively engage with the wider community to find out what their perception of the costs and benefits truly were, instead depending on limited input from a few convenient community "spokespersons." The organization might have spent a few thousand dollars on materials and staff time, but they did not consider, for example, the cost in time, energy, or supplies to the volunteers, especially over time. They may have thought that access to fresh food was the issue, when in reality the larger community might have valued convenience or job security much more than healthy food options.

Research has shown time and again that successful resilience projects require innovative, inclusive, and "risky" engagement, whether for a community garden (Twiss

et al., 2003), new industrial venture (Wang et al., 2016), or disaster preparedness (Baybay et al., 2019). As most organizations are funded by risk-averse entities, however, the lack of any hard data and solid rationale for more effective strategies allows the existing short-term, upfront-price-driven focus on ineffective but "safe" engagement methodologies, and the resultant inadequacies in communication and planning, to continue. This cycle costs not just the millions of dollars wasted on failed projects but also precious personal capital with communities, leading to even greater disengagement and distrust.

Research Questions, Hypotheses, and Specific Aims

Given the considerable expense and importance of effective engagement to community resilience, my research strove to fill the gap between the 'why' of engagement to the 'how,' providing practitioners with relevant, implementable, data-driven process recommendations. To develop these recommendations for strategic, efficient, and effective community engagement, the research explored the following questions:

- What main social and behavioral factors can predict the receptiveness of a community to and the eventual efficacy of a resilience initiative?

I hypothesized that the perceived overall levels of the variables of "shared values" and "trust" in a community would correspond positively with the efficacy of project-specific community engagement efforts, in terms of lower engagement costs and more impactful outcomes.

- What actions should organizations build into the early stages of resilience initiatives to increase community receptiveness and eventual program success?

I hypothesized that the more investment organizations made in ongoing, transparent communication, and the more varied and overlapping those forms of communication were, the greater the sense of "trust" and "shared values" community stakeholders would have, which would lead to greater project-specific receptivity and efficacy.

- What are the most effective engagement methodologies for community resilience initiatives and which methodologies are demonstrably ineffective?

I hypothesized that engagement strategies based on the shared values of a given community, such as financial security, personal health, or social connectivity, would prove most effective.

Specific Aims

The following tasks were completed in the course of this research:

1. Selection of a representative set of resilience projects to analyze.

2. Establishment of a standardization and analytical framework for comparing community factors to engagement outcomes and outputs.

3. Analysis of the correlations between social factors and engagement strategies, determining an efficacy ranking of existing engagement methodologies and best practices to maximize engagement investment and efficacy.

Chapter II

Methods

This research sought to examine the efficacy of existing community engagement

methodologies by comparatively analyzing a representative selection of recent

community resilience initiatives. Initially, the expectation for this research was to include

cost and benefit data from an even distribution of projects and programs across

communities of differing types and sizes, although it was noted that quality quantifiable

data might prove difficult to gather, especially during the pandemic. As it happened, such

data proved nearly impossible to gather, as few organizations are in the habit of

collecting, tracking, or reporting on specific costs and benefits associated with their

community engagement initiatives. Even within my own organization I found that such

costs were rarely recorded in a way that makes statistically significant cost-benefit

analysis possible. While most organizations keep a record of all expenditures associated

with any project, and some track in-kind costs, the level of detail of financial records is

generally limited to what is required by any given funder. Therefore, financial data is

often amalgamated or broken into funder-specified categories, rather than operational

categories, while non-fiscal data is most often collated in subjective, narrative form.

Conversations with organizational colleagues over the course of several months led to

many admissions, even from myself, that if a funder's guidelines do not require a report

on something, that thing is not usually tracked, even if such data would prove beneficial

in the long run. The consensus among my colleagues was that organizations are simply

too short on manpower to allow for any tasks deemed non-essential. While this led to considerable personal frustration, and a pivot in my overall research design, it did also highlight the importance of the development of a tool to allow organizations to easily and effectively – with a significant emphasis on the convenience factor – track all costs and benefits so that authentic and meaningful evaluation can be undertaken at the completion of a project, and so that effective and strategic planning can be undertaken at the start. The specific design of such a tool is outside the scope of this research, but it is hoped that the results and discussion presented will greatly assist in its development.

Research Design

As mentioned, examining the efficacy of existing community engagement methodologies with the available data required a pivot in research design, from smaller-scale, individual initiatives within localized community development organizations to broader initiatives on a global scale. Specifically, a comparative analysis was applied to data available in reports by cities participating in the United Nations Office for Sustainable Development (UNOSD) Voluntary Local Review (VLR) process (UNOSD, 2022). Representativeness was developed by including reports from distinct geographic locations, histories, and social structures. To minimize any time-related variance, representative initiatives were selected from publicly available VLRs published during 2021, which cover similar overall time frames. The analysis considered the general maturity of the initiative and/or the experience of project leadership with similar initiatives, as well as community size and location, and the framework within which this analysis was completed was based upon the Envision sustainable infrastructure assessment tool (ISI, 2018).

Relevance of the UN Office for Sustainable Development

As a recognized and trusted global advising body for sustainability and resilience, the UN Office for Sustainable Development (UNOSD) is at the forefront of wide-lens, long-term sustainable development theory and practice. Positioned within the UN Department of Economic and Social Affairs (UN DESA), the UNOSD is committed to building a body of knowledge of sustainable development best practices as well as disseminating that knowledge and strengthening the implementation capacity of agencies, institutions, and organizations (UNOSD, 2022).

Figure 3. UN Sustainable Development Goals (UNOSD, 2022).

In 2015, the UN adopted the 2030 Agenda for Sustainable Development, which included a list of 17 Sustainable Development Goals (Figure 3), representing the latest step in a decades-long effort to increase equitable, lasting, global resilience. This effort asserts that authentic resilience is based upon a balanced view of People, Planet, Prosperity, Peace, and Partnership (UNOSD, 2022), corresponding to the five main categories of operational resilience programming (ICOR, 2015) utilized by on-the-ground community resilience practitioners:

- Quality of Life, including programs and projects related to subjects such as health & human well-being, education access, and housing;

- Environment, including programs and projects related to subjects such as clean air and water, conservation, and sustainable food systems;

- Socioeconomic Equity, including programs and projects related to subjects such as employment access, resource management, and economic diversification;

- Governance, including programs and projects related to subjects such as legal access and equity, regulatory transparency, and public safety;

- Community Connectivity, including programs and projects related to subjects such as social support infrastructure, social justice, and communication.

The Voluntary Local Review Process

With the indicators and objectives of the Sustainable Development Goals (SDGs) as guidance, member states of the UN are encouraged to regularly evaluate their progress toward all five categories of resilience. Over the last few years this encouragement has led to the development of Voluntary Local Reviews (VLRs) as cities and regions attempt to identify and share their local-level challenges and solutions in implementing resilience initiatives designed for global benefit (UNOSD, 2022). A total of 20 reports were submitted in 2021 from cities in 10 different countries around the globe: Belgium, Brazil, Denmark, Finland, Japan, Malaysia, Mexico, Norway, Peru, and the United States. Of the reports available in English, five were selected to represent distinct geographic and cultural regions: Orlando, United States; São Paulo, Brazil; Subang Jaya, Malaysia; Vantaa, Finland; and Yokohama, Japan. VLRs hold no official weight and currently do

not follow a set reporting template, but they do all examine a community's progress toward resilience, including the engagement process, through the unifying lens of the SDGs (UNOSD, 2022). I found the selected VLRs to be both thorough and forthright, offering authentic, unique insights into the struggle of balancing societal and operational risks and results.

The UN also maintains the Sustainable Development Report (SDR), an up-to-date assessment index of individual countries' progress toward achievement of the SDGs, available in multiple formats such as reports, rankings, charts, and interactive data visualization tools (UNOSD, 2022). The SDR was used alongside the VLRs and the Envision-based evaluation framework to provide necessary country-level background and context for the comparative status of each community's local-level resilience efforts.

Envision Sustainable Infrastructure Assessment Framework

In order to establish a framework to compare community factors, engagement methodologies, and program outcomes and outputs among relatively disparate communities, projects, and reporting formats, this research made use of the Envision sustainable infrastructure assessment tool (ISI, 2018). The scarcity of standardized or quantifiable data required a subjective approach which could still be suitably rigorous for academic analysis, a challenge to which the Envision system is uniquely suited.

Envision was developed in 2012 through a partnership with the Institute for Sustainable Infrastructure (ISI) and the Zofnass Program for Sustainable Infrastructure at Harvard University's Graduate School of Design, and is continually being reviewed, revised, and updated to suit the changing landscape of community redevelopment and resilience planning. Since its inception, Envision has been utilized to assess more than

$100 billion worth of officially graded and verified projects, $25 billion worth of registered projects that did not seek an official award (ISI, 2022), and countless unofficial projects. The program now boasts more than 6000 certified Envision Sustainability Professionals (ENV SPs), and I personally utilize the framework for project planning and evaluation in my daily work. My familiarity with the framework has been further strengthened through my participation as a Teaching Assistant for the Envision-focused Harvard University course ENVR E-119E, Sustainable Infrastructure: Learning from Practice. When it was clear that appropriate, quantifiable data was not forthcoming for this research and a simple Excel spreadsheet analysis would not be possible, a pivot to utilizing the Envision system made perfect sense.

Outside of my own experience, Envision has a solid, practical foundation and significant credence beyond its roots in the Zofnass Program, given that the ISI was founded through a collaboration between the American Public Works Association (APWA), the American Society of Civil Engineers (ASCE), and the American Council of Engineering Companies (ACEC). The current, third iteration of Envision is the only vetted and trusted tool available in North America which comprehensively examines public-benefit projects for balanced solutions to resilience issues such as public health, climate change, economic recovery, environmental justice, and cooperative governance (ISI, 2022), including the crucial factor of meaningful public engagement.

Like the UNOSD and ICOR's Community Resilience visualization framework, Envision also utilizes five categories of resilience. In Envision's case, those five categories are Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Resilience (Figure 4). Within those five primary categories, there are a total

Envision Credit List

Quality Of Life
14 Credits

WELLBEING
QL1.1 Improve Community Quality of Life
QL1.2 Enhance Public Health & Safety
QL1.3 Improve Construction Safety (N)
QL1.4 Minimize Noise & Vibration
QL1.5 Minimize Light Pollution
QL1.6 Minimize Construction Impacts (N)

MOBILITY
QL2.1 Improve Community Mobility & Access
QL2.2 Encourage Sustainable Transportation
QL2.3 Improve Access & Wayfinding

COMMUNITY
QL3.1 Advance Equity & Social Justice (N)
QL3.2 Preserve Historic & Cultural Resources
QL3.3 Enhance Views & Local Character
QL3.4 Enhance Public Space & Amenities

QL0.0 Innovate or Exceed Credit Requirements

Leadership
12 Credits

COLLABORATION
LD1.1 Provide Effective Leadership & Commitment
LD1.2 Foster Collaboration & Teamwork
LD1.3 Provide for Stakeholder Involvement
LD1.4 Pursue Byproduct Synergies

PLANNING
LD2.1 Establish a Sustainability Management Plan
LD2.2 Plan for Sustainable Communities (N)
LD2.3 Plan for Long-Term Monitoring & Maintenance
LD2.4 Plan for End-of-Life

ECONOMY
LD3.1 Stimulate Economic Prosperity & Development
LD3.2 Develop Local Skills & Capabilities
LD3.3 Conduct a Life-Cycle Economic Evaluation (N)

LD0.0 Innovate or Exceed Credit Requirements

Resource Allocation
14 Credits

MATERIALS
RA1.1 Support Sustainable Procurement Practices
RA1.2 Use Recycled Materials
RA1.3 Reduce Operational Waste
RA1.4 Reduce Construction Waste (N)
RA1.5 Balance Earthwork On Site

ENERGY
RA2.1 Reduce Operational Energy Consumption
RA2.2 Reduce Construction Energy Consumption (N)
RA2.3 Use Renewable Energy
RA2.4 Commission & Monitor Energy Systems

WATER
RA3.1 Preserve Water Resources
RA3.2 Reduce Operational Water Consumption
RA3.3 Reduce Construction Water Consumption (N)
RA3.4 Monitor Water Systems

RA0.0 Innovate or Exceed Credit Requirements

Natural World
14 Credits

SITING
NW1.1 Preserve Sites of High Ecological Value
NW1.2 Provide Wetland & Surface Water Buffers
NW1.3 Preserve Prime Farmland
NW1.4 Preserve Undeveloped Land

CONSERVATION
NW2.1 Reclaim Brownfields (N)
NW2.2 Manage Stormwater
NW2.3 Reduce Pesticide & Fertilizer Impacts
NW2.4 Protect Surface & Groundwater Quality

ECOLOGY
NW3.1 Enhance Functional Habitats
NW3.2 Enhance Wetland & Surface Water Functions
NW3.3 Maintain Floodplain Functions
NW3.4 Control Invasive Species
NW3.5 Protect Soil Health

NW0.0 Innovate or Exceed Credit Requirements

Climate and Resilience
10 Credits

EMISSIONS
CR1.1 Reduce Net Embodied Carbon
CR1.2 Reduce Greenhouse Gas Emissions
CR1.3 Reduce Air Pollutant Emissions

RESILIENCE
CR2.1 Avoid Unsuitable Development
CR2.2 Assess Climate Change Vulnerability
CR2.3 Evaluate Risk & Resilience (N)
CR2.4 Establish Resilience Goals and Strategies (N)
CR2.5 Maximize Resilience
CR2.6 Improve Infrastructure Integration

CR0.0 Innovate or Exceed Credit Requirements

Rewritten

(N) New

Figure 4. Envision categories and indicator credits (ISI, 2022).

of 64 indicators on which any given project or program can be assessed. The indicators

within the main Envision categories (Figure 4) look at the multi-faceted reality of

resilience in a unique cross-perspective manner, creating the expectation that People,

Planet, Prosperity, Peace, and Partnerships should be part of any and all resilience

initiatives. Crucially, the People a project is meant to serve at the forefront of planning,

design, and implementation, without compromising lasting ecological sustainability.

While designed to assess physical infrastructure projects, Envision has proven valuable as

a tool to plan, design, implement, and evaluate projects and programs in both physical

and social infrastructure, further highlighting the interconnection between the built

environment and the humans who utilize it.

Ranking Engagement Methodology Efficacy and Value

Gleaning sufficient, comparable objective and subjective data from the

representative VLRs was crucial to conducting a methodical comparative analysis of

social factors and engagement strategies, which was then considered in terms of the

impact of engagement on expected, perceived, and/or recorded project success. As VLRs

are high-level reporting documents concentrating on lessons learned from community-

wide, long-term resilience initiatives, there is very little detailed information provided on

individual, physical projects, meaning that some of Envision's indicators did not apply

and could be disregarded for the purposes of this research. In actual practice, this sort of

selective utilization of the Envision framework is quite common for unofficial, non-

award-seeking project and program assessments, although it is suggested and beneficial

to consider seemingly unrelated indicators for any unexpected or potential risks,

challenges, strengths, or synergies (ISI, 2018). For the purposes of this comparative

analysis, evaluation focused on the categories of Quality of Life, Leadership, and Climate and Resilience, which contain most of the indicators related to meaningful community engagement, while any particularly important or impactful information related to the Resource Allocation or Natural World categories was noted for additional context.

The Envision Checklist, which is the framework's scorecard, provided a streamlined grading and ranking system for objective, overall project achievement. Detailed Evaluation Criteria worksheets (Figure 5) provided the context and justification for the assigned ranking of representative communities and highlighted implementable recommendations of best practices for future community engagement planning.

LEADERSHIP: COLLABORATION

LD1.3 Provide for Stakeholder Involvement

LEVELS OF ACHIEVEMENT

IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
A + B	A + B + C	A + B + C + D	A + B + C + D + E	A + B + C + D + E + F
(3) Active Engagement	(6) Direct Engagement	(9) Community Involvement	(14) Community Satisfaction	(18) Stakeholder Partnerships

(A) Primary and secondary stakeholders are identified through a stakeholder mapping process. Stakeholder concerns and specific objectives for stakeholder engagement are defined.

(B) A proactive stakeholder engagement process is established with clear objectives. This occurs at the earliest stages of planning and is sustained through project construction. Engagement moves beyond education into active dialogue. Stakeholder views are monitored, and a two-way line of communication is established to reply to inquiries. Sufficient opportunities are provided for stakeholders to be involved in decision making. The participation process is transparent with opportunities to provide meaningful input.

(C) A lead person from the project team, in addition to any public involvement lead or manager, works with stakeholder groups to understand communication needs and the desire for and scope of involvement.

(D) There are specific cases in which public input influenced or validated project outcomes. Potentially conflicting stakeholder views were evaluated and addressed equitably during decision making.

(E) Feedback is sought from stakeholders as to their satisfaction with the engagement process, and the resulting decisions were made based on their input.

(F) One or more stakeholders, having mutual interests or interdependencies, are identified and engaged as partners.

Figure 5. Sample Envision evaluation criteria (ISI, 2022).

To begin this comparative analysis, each of the representative VLRs was reviewed and assessed within the Envision framework to determine preliminary rankings and identify any critical data gaps requiring additional research and documentation. While this assessment considered the impact of all 64 Envision credits, the comparison itself was based on the 19 indicators most associated with the confluence of community engagement and overall program success. A description of each category, breakdown of selected credits, and the rationale behind any non-selected credits are outlined below:

- Quality of Life: "Addresses a project's impacts on communities, from the health, wellbeing, and equity of individuals to that of the larger social fabric." (ISI, 2022)

  o QL1.1   Improve Community Quality of Life (26 points)

  o QL1.2   Enhance Public Health & Safety (20 points)

  o QL2.1   Improve Community Mobility Access (14 points)

  o QL2.2   Encourage Sustainable Transportation (16 points)

  o QL3.1   Advance Equity & Social Justice (18 points)

  o QL3.4   Enhance Public Space & Amenities (14 points)

When reviewing Quality of Life indicators, credits QL1.3 through QL1.6 – related to construction safety and the minimization of disturbances during construction – were not selected for the purposes of this analysis as construction impacts were not a focus of the submitted VLRs. This is not to say that consideration of construction impacts during project planning or implementation is not important to overall engagement and program success. Rather, the information available in the VLRs was not specific to any construction project, and so could not be assessed. Likewise, while some cities took pains to consider portions of credits QL2.3, Access and Wayfinding, QL3.2, Cultural

Preservation, and QL3.3, Views & Character, not enough information was available across all representative communities to allow comparison.

- Leadership: "Rewards communication, collaboration, teamwork, leadership, and commitment to sustainability. Also rewards meaningful stakeholder engagement and lifecycle economic evaluation." (ISI, 2022)

    o   LD1.1   Provide Effective Leadership & Commitment (18 points)

    o   LD1.2   Foster Collaboration & Teamwork (18 points)

    o   LD1.3   Provide for Stakeholder Involvement (18 points)

    o   LD2.1   Establish a Sustainability Management Plan (18 points)

    o   LD2.2   Plan for Sustainable Communities (16 points)

    o   LD3.1   Stimulate Economic Prosperity & Development (20 points)

    o   LD3.2 Develop Local Skills & Capabilities (16 points)

When reviewing Leadership indicators, credits LD1.4, LD2.3, LD2.4, and LD3.3 – Byproduct Synergies, Long-Term Monitoring, End-of-Life Planning, and Life-Cycle Economic Evaluation – were not selected for the purposes of this analysis as these credits relate more to planning for specific projects rather than for large-scale, systemic programs such as those highlighted in the VLRs. While some reports, such as from the city of Orlando, did discuss the economics of their programs to a limited extent, in general the VLRs did not present sufficient comprehensive economic data for any sort of comparative analysis. Nor were specific long-term monitoring and end-of-life considerations prevalent, as all representative communities appear to consider their sustainability journeys long term initiatives with integrated review processes.

- Climate and Resilience: "Focuses on minimizing emissions that exacerbate climate change and magnify short- and long-term risks; ensures projects are resilient and contribute to resilient communities." (ISI, 2022)
    - CR2.1 Avoid Unsuitable Development (16 points)
    - CR2.2 Assess Climate Change Vulnerability (20 points)
    - CR2.3 Evaluate Risk and Resilience (26 points)
    - CR2.4 Establish Resilience Goals and Strategies (20 points)
    - CR2.5 Maximize Resilience (26 points)
    - CR2.6 Improve Infrastructure Integration (18 points)

When reviewing Climate and Resilience indicators, credits CR1.1 to CR1.3 – related to specific Emission benchmarks – were not selected for the purposes of this analysis due to a lack of comparable information or relevance to community engagement. These particular indicators are largely quantitative in focus, and few VLRs submitted such specific information, with the notable exception of Orlando, which appears to have a mature program with very robust reporting.

Chapter III

Results

Results are presented in two formats to allow for individual and comparative evaluation of the context and experiences of the sample cities. First, in the city-specific section, a brief background for each community's resilience initiative is provided, followed by a country-level performance overview and a closer look at how the city compares to its home nation. Then the city's Envision assessment results are offered in table form, followed by a concise discussion of how and why those experiences relate to the questions being explored in this research. Full Evaluation Criteria worksheets can be found in Appendix 1. In the subsequent section, the city-specific results are ranked and comparatively analyzed to determine if the research hypotheses are supported.

City-Specific Context and Findings

Included in each city's assessment, which are listed here in order of rank to demonstrate the assessment methodology and illustrate the findings of this research, is a graphic showing the relevant country-level SDG Dashboard (UNOSD, 2022) for a high-level overview of the context in which the city must operate. The UN color-codes these graphics to facilitate interpretation: red blocks indicate a goal with major implementation challenges, while a red arrow indicates negative progress for that goal; yellow and orange blocks indicate moderate to significant challenges, while yellow or orange arrows indicate slow or stalled progress; green blocks indicate satisfactory performance on a sustainability goal, while a green arrow indicates satisfactory, positive progress.

#1 - City of Orlando, United States

The city of Orlando has the longest standing official resiliency program of the selected representative communities, having organized a Green Works Orlando plan in 2007 (Castro et al, 2021). The city embraced the UN's 2030 Sustainable Development Goals, updating their Green Works program to match the SDGs in 2015, and 2021 saw the release of their first VLR. From the perspective of the 2021 Report, city leadership appears to be well informed, well connected, and committed to the SDGs and the overall goal of authentic resilience for their community; their experiences over the last fifteen years have led to the development of what appear to be robust planning, tracking, and evaluation mechanisms.

In terms of the national, regional, and local cultural context, Orlando could be said to be more progressive than many cities in the United States, which has lagged in prioritizing resilience (Sedwill et al., 2021). The US is ranked at #32 on the UN's Sustainable Development Index, with 76% achievement to date of the 2030 Sustainable Development Goals and experiencing moderate to major challenges to realize full achievement, as shown in Figure 6 below. It is important to note that even where the UNOSD ranks progress as only moderately challenged with satisfactory SDG achievement, such as Goal #11, Sustainable Cities and Communities, the UN's indicator thresholds are low, especially in the context of a developed nation. Rankings are also amalgamated, which is less than ideal considering every country has very distinct regions with their own challenges (Cripps et al., 2009). For example, for Goal #11, the United States scores well for a low percentage of slums in major cities and for having relatively clean water in major cities, and scores lower for less than adequate public transportation

and high rent burdens, especially among the elderly (UNOSD, 2022). It could certainly be argued, especially from the perspective of a resilience practitioner focused on the "5 P's," that there is far more to a sustainable community than the barest necessities of housing, water, and transportation. The SDGs do overlap and interact, and the United States as a whole still continues to struggle with aspects of resilience such as justice (Goal #16), cooperation (Goal #17), and climate action (Goal #13).

Figure 6. SDG Dashboard, United States (UNOSD, 2022).

Orlando, however, ranks very highly for cooperation and overall quality of life within the Envision framework, and the city's 2021 VLR indicated strong progress on many SDGs with solid, implementable plans in place to improve any that are lagging. When assessed against the 19 selected comparison Envision Credits, Orlando ranked highest of the five representative communities, achieving a total of 347 out of 358 possible points for the selected engagement-focused credits, or 97% achievement. The city managed to qualify for 94% of the points available in the Quality of Life category, 100% in the Leadership category, and 96% in Climate and Resilience.

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Table 1. Envision assessment results – City of Orlando.

Quality of Life	Assessment Status					Points
	Improved	Enhanced	Superior	Conserving	Restorative	
QL1.1 Improve Community Quality of Life	0	0	0	0	26	26 out of 26
QL1.2 Enhance Public Health & Safety	0	0	0	0	20	20 out of 20
QL2.1 Improve Community Mobility Access	0	0	0	11	0	11 out of 14
QL2.2 Encourage Sustainable Transportation	--	0	0	0	16	16 out of 16
QL3.1 Advance Equity & Social Justice	0	0	0	0	18	18 out of 18
QL3.4 Enhance Public Space & Amenities	0	0	0	11	0	11 out of 14

Quality of Life Category Total: **94%** - **102 out of 108**

Leadership	Assessment Status					Points
	Improved	Enhanced	Superior	Conserving	Restorative	
LD1.1 Provide Effective Leadership	0	0	0	18	--	18 out of 18
LD1.2 Foster Collaboration & Teamwork	0	0	0	18	--	18 out of 18
LD1.3 Provide for Stakeholder Involvement	0	0	0	0	18	18 out of 18
LD2.1 Establish a Management Plan	0	0	0	18	--	18 out of 18
LD2.2 Plan for Sustainable Communities	0	0	0	0	16	16 out of 16
LD3.1 Stimulate Economic Prosperity	0	0	0	20	--	20 out of 20
LD3.2 Develop Local Skills & Capabilities	0	0	0	0	16	16 out of 16

Leadership Category Total: **100%** - **124 out of 124**

Climate & Resilience	Assessment Status					Points
	Improved	Enhanced	Superior	Conserving	Restorative	
CR2.1 Avoid Unsuitable Development	0	0	0	0	16	16 out of 16
CR2.2 Assess Climate Change Vulnerability	0	0	0	20	--	20 out of 20
CR2.3 Evaluate Risk and Resilience	0	0	0	26	--	26 out of 26
CR2.4 Establish Resilience Strategies	--	0	0	20	--	20 out of 20
CR2.5 Maximize Resilience	0	0	0	26	--	26 out of 26
CR2.6 Improve Infrastructure Integration	0	0	0	13	0	13 out of 18

Climate & Resilience Category Total: **96%** - **121 out of 126**

The City of Orlando scored very well in all community engagement focused Envision indicators, showing strong commitment toward authentic communication, interaction, and inclusion of diverse community perspectives.

While the United States in general has a fiercely individualistic culture (Rosenbaum, 2018), Orlando's 2021 VLR shows a city that has embraced the spirit of collaboration, turning partnerships and cooperation into a shared, community-wide value. Efforts toward realizing resilience within Orlando have focused on that shared value, integrating a diverse array of stakeholders throughout the community in every level of program strategy, planning, and implementation. While Orlando did make some use of traditional tools such as public surveys, which had a statistically insignificant response rate of 0.3%, the city's primary engagement methodology was interactive workshops facilitated through a broad network of community partners. Between 2018 and 2021, Orlando's leadership hosted regular dialogue and a total of 21 formal task force and focus-area roundtables with local and regional community groups, businesses, organizations, institutions, and agencies, combining the voices of the membership of 127 distinct entities. Critically, these workshops were not simply informational or educational in nature but were a keystone of the development of the Green Works Orlando program, building trust within the community and ensuring that needs, priorities, and potential solutions were comprehensive and equitable (Castro et al., 2021).

Based on Orlando's culture of and expectation for open communication, connectivity, and collaboration (Castro et al., 2021), the use of an interactive engagement methodology has resulted in a long-term, city-wide resilience initiative that has been well-received by community members. The community appears to feel authentic ownership of Green Works Orlando, growing the beneficial impact of the program well beyond what would be possible though the efforts of municipal leadership alone.

#2 - City of São Paulo, Brazil

The city of São Paulo is considered a global leader in sustainability and resilience (UNDRR, 2014), and recent years have seen a renewed urgency to their already-robust municipal resilience program, as evidenced by the documentation in their 2021 VLR. São Paulo was the only community in this research to have a prior VLR submitted to the UN, with the first published in 2020. From the perspective of the 2021 Report, city leadership – which must manage one of the largest megacities in the world with a population of over 22 million residents (UCCI, 2021) – is doing a commendable job improving their overall resilience. Some shortcomings remain but are understandable given the scale of a program for a city that is larger than many countries.

In terms of the national, regional, and local cultural context, São Paulo is in line with the trends within the country, which has shown a strong commitment to resilience in recent years (World Bank, 2019). Brazil is ranked at #61 on the UN's Sustainable Development Index, with 71.3% achievement to date of the 2030 Sustainable Development Goals, with both great successes and continued challenges to full achievement, as shown in Figure 7 below. Many of the SDG indicators are well suited to a country like Brazil, where nearly 90% of inhabitants live in sprawling metropolitan regions like São Paulo. The rapid population growth in these urban areas over the last several decades has led to significant challenges with poverty, public health, equity and justice, and environmental degradation (UCCI, 2021). These challenges are evidenced by lagging performance and stagnant progress on resilience aspects such as equitable economic development (Goal #8), ecological protection and restoration (Goals #13 and 14), and justice (Goal #16).

Brazil has performed especially well, however, in the achievement of Goal #7 –

Affordable and Clean Energy – with the government reporting that 83% of energy

generation for the country comes from renewable sources. While much of Brazil's

renewable energy mix is from hydroelectric plants, which have their own social and

environmental concerns (Fendt, 2021), as of 2021, 47.3% of the country's power is

coming from renewable sources other than hydroelectric (CEM, 2022), sparking

improvements in training, job creation, water quality, and holistic climate action.

Figure 7. SDG Dashboard, Brazil (UNOSD, 2022).

As with Brazil as a whole, São Paulo performs relatively well on resilience

indicators, with a few exceptions attributable to the sheer size and hierarchy of the

megacity. When assessed against the 19 selected comparison Envision Credits, São Paulo

ranked second-highest of the five representative communities, achieving a total of 314

out of 358 possible points for the selected engagement-focused credits, or 88%

achievement. The city qualified for 84% of the points available in the Quality of Life

category, 85% in the Leadership category, and 93% in Climate and Resilience.

Table 2. Envision assessment results – City of São Paulo.

		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
Quality of Life	QL1.1 Improve Community Quality of Life	0	0	0	0	26	26 out of 26
	QL1.2 Enhance Public Health & Safety	0	0	0	0	20	20 out of 20
	QL2.1 Improve Community Mobility Access	0	0	0	0	0	0 out of 14
	QL2.2 Encourage Sustainable Transportation	--	0	0	0	16	16 out of 16
	QL3.1 Advance Equity & Social Justice	0	0	0	0	18	18 out of 18
	QL3.4 Enhance Public Space & Amenities	0	0	0	11	0	11 out of 14

Quality of Life Category Total: **84%** - **91 out of 108**

		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
Leadership	LD1.1 Provide Effective Leadership	0	0	0	18	--	18 out of 18
	LD1.2 Foster Collaboration & Teamwork	0	0	12	0	--	12 out of 18
	LD1.3 Provide for Stakeholder Involvement	0	0	0	0	18	18 out of 18
	LD2.1 Establish a Management Plan	0	0	0	18	--	18 out of 18
	LD2.2 Plan for Sustainable Communities	4	0	0	0	0	4 out of 16
	LD3.1 Stimulate Economic Prosperity	0	0	0	20	--	20 out of 20
	LD3.2 Develop Local Skills & Capabilities	0	0	0	0	16	16 out of 16

Leadership Category Total: **85%** - **106 out of 124**

		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
Climate & Resilience	CR2.1 Avoid Unsuitable Development	0	0	0	0	16	16 out of 16
	CR2.2 Assess Climate Change Vulnerability	0	0	0	20	--	20 out of 20
	CR2.3 Evaluate Risk and Resilience	0	0	0	26	--	26 out of 26
	CR2.4 Establish Resilience Strategies	--	0	0	20	--	20 out of 20
	CR2.5 Maximize Resilience	0	0	0	26	--	26 out of 26
	CR2.6 Improve Infrastructure Integration	0	0	9	0	0	9 out of 18

Climate & Resilience Category Total: **93%** - **117 out of 126**

The City of São Paulo scored very well in almost all community engagement focused Envision indicators, showing dedication for the health and well-being of city residents, the local environment, and the power of connection and collaboration.

Brazil, in general, has a vibrant, diverse culture, a product of the blending of numerous immigrant groups over the last three hundred years (UCCI, 2021). São Paulo's 2021 VLR reflects this diversity and demonstrates a significant challenge for a megacity: how to truly understand the perspectives and meet the needs of so many people, from so many backgrounds, living in so many different situations (Medran & Recaman, 2017). São Paulo's experience with their 2020 VLR led them to understand that the municipality alone could not understand or tackle resilience at this scale (UCCI, 2021) and more civic engagement and partnership was necessary. Therefore, in late 2019, the city formed a Municipal Commission for Sustainable Development with the participation of 120 individuals from 16 distinct community organizations, institutions, and regional entities. Members of this Commission were tasked with being liaisons between the municipality and the individual communities within São Paulo, bringing an additional layer of transparency, authenticity, and efficacy to resilience efforts and reporting (UCCI, 2021).

To date, this multi-layered platform appears to be working reasonably well, with 135 of the UN's SDG indicators selected for direct action by the administration of São Paulo and its partners. A host of collaborative programs and projects, from green space restoration to arts programs to public health initiatives, that are aligned with both the SDG objectives and community-specific needs, resources, and challenges are underway (UCCI, 2021; UNOSD, 2022; World Bank, 2019). While still relatively young and in need of continued refinement, São Paulo's partnership-based model of resilience planning and implementation appears to be a step in the right direction, with improved outcomes and reported civic participation up from the 2020 VLR.

#3 - City of Subang Jaya, Malaysia

The city of Subang Jaya has a shorter history than the other representative communities in this analysis, having been a rubber plantation until 1976 and only reaching official city status in 2020 (Hashim et al., 2021). Being a designed city, and presumably because of its relative youth, Subang Jaya has embraced all things modern and currently serves as a pilot city for the Malaysian government mandated VLR initiative (Hashim et al., 2021). From the perspective of the 2021 Report, municipal leadership appears to be in line with national goals, supported by regional and national partners, and reasonably aware of the challenges facing the residents of their city.

In terms of the national, regional, and local cultural context, Subang Jaya is a model of Malaysia's ideal city of tomorrow: green, clean, vibrant, and connected (EPU, 2015). Malaysia itself is ranked at #65 on the UN's Sustainable Development Index, with 70.9% achievement to date of the 2030 Sustainable Development Goals. The country's successes and challenges in achievement of the SDGs are both linked to the national push for growth, as demonstrated in Figure 8 below. Rapid growth and a focus on technological advancement has led to a booming economy, although at the expense of some ecological concerns. The swift pace of development has also struggled to include all members of a historically patriarchal and hierarchical society (Shamsul, 2001), with equity concerns still an issue. While Malaysia has made significant progress on almost all SDGs since their adoption in 2015, shortcomings remain on resilience aspects such as ecological protection and restoration (Goals #13 and 14), equality (Goals #5 and 10), and food security issues (Goal #2), especially in less modern and urbanized areas.

Malaysia has performed well, however, in the achievement of Goal #1 – No

Poverty – with the UNOSD Sustainable Development Report (2022) showing that

extreme poverty, defined as individuals living on less than $1.90/day, has been

eliminated in the country since 2014. Even more promising, Malaysia has also achieved

the secondary benchmark for eradicating poverty, with only 2% of the population living

on less than $3.20/day, which goes far toward improving overall community resilience.

Figure 8. SDG Dashboard, Malaysia (UNOSD, 2022).

Subang Jaya, likewise, ranks quite highly for planning and growth indicators but

has a notable lack of meaningful community engagement or inclusion on the

identification of remaining challenges or the development of potential solutions. When

assessed against the 19 selected comparison Envision Credits, Subang Jaya ranked third

out of the five representative communities, achieving a total of 293 out of 358 possible

points for the selected engagement-focused credits, or 82% achievement. The city

qualified for 76% of the points available in the Quality of Life category, 81% in the

Leadership category, and 88% in Climate and Resilience.

Table 3. Envision assessment results – City of Subang Jaya.

		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
Quality of Life	QL1.1 Improve Community Quality of Life	2	0	0	0	0	2 out of 26
	QL1.2 Enhance Public Health & Safety	0	0	0	0	20	20 out of 20
	QL2.1 Improve Community Mobility Access	0	0	0	0	14	14 out of 14
	QL2.2 Encourage Sustainable Transportation	--	0	0	0	16	16 out of 16
	QL3.1 Advance Equity & Social Justice	0	0	0	0	18	18 out of 18
	QL3.4 Enhance Public Space & Amenities	0	0	0	0	14	14 out of 14

Quality of Life Category Total: **76%** - **82 out of 108**

		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
Leadership	LD1.1 Provide Effective Leadership	0	0	0	18	--	18 out of 18
	LD1.2 Foster Collaboration & Teamwork	0	0	12	0	--	12 out of 12
	LD1.3 Provide for Stakeholder Involvement	0	0	0	0	0	0 out of 18
	LD2.1 Establish a Management Plan	0	0	0	18	--	18 out of 18
	LD2.2 Plan for Sustainable Communities	0	0	0	0	16	16 out of 16
	LD3.1 Stimulate Economic Prosperity	0	0	0	20	--	20 out of 20
	LD3.2 Develop Local Skills & Capabilities	0	0	0	0	16	16 out of 16

Leadership Category Total: **81%** - **100 out of 124**

		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
Climate & Resilience	CR2.1 Avoid Unsuitable Development	0	0	0	0	16	16 out of 16
	CR2.2 Assess Climate Change Vulnerability	0	0	0	20	--	20 out of 20
	CR2.3 Evaluate Risk and Resilience	0	0	24	0	--	24 out of 26
	CR2.4 Establish Resilience Strategies	--	0	0	20	--	20 out of 20
	CR2.5 Maximize Resilience	0	0	0	26	--	26 out of 26
	CR2.6 Improve Infrastructure Integration	0	5	0	0	0	5 out of 18

Climate & Resilience Category Total: **88%** - **111 out of 126**

The City of Subang Jaya scored moderately well in most community engagement focused Envision indicators, showing strong commitment toward improving the quality of life for residents. A critical gap remains in stakeholder involvement, however, leading to less than desirable outcomes on that very goal.

While Malaysia's society is considered authoritarian (Amnesty International, 2020), Subang Jaya's 2021 VLR indicates that the city is attempting to find a middle ground between acknowledging repressive governance and cultural habits (Blatt, 2021; Shamsul, 2001) and nurturing more equitable social systems. The influence of paternalism and strict government control, however, is quite evident in the city's choice of priority objectives for their social resilience programs: goals that are ostensibly easier to impact through official directives and regulations – urban governance, urban planning and development, socio-economic development, mobility and access; and, a goal that seems noble but lacks depth upon closer inspection – inclusivity and equity.

Crucially, the VLR indicated that there was a complete lack of authentic community engagement; to date, only one informational workshop has been held, at which 98 of the participants were government employees, and only 17 were private individuals. Also concerning is that plans to improve equity currently revolve entirely around providing safer services and amenities for women, often through segregation, which is somewhat helpful and practical given the current gender equity issues within Malay culture (Amnesty International, 2020), but does not even attempt to address or resolve the underlying misogynistic issues.

Given the overarching culture within Subang Jaya, it is possible that some residents will respond well to the directives-from-on-high approach taken by the City Council. The VLR itself notes, though, that for true progress to be made, higher levels of trust between government and citizens must be established, and, given recent unrest and protests against severe and inequitable governance (Blatt, 2021), it is unlikely that the program will attract true buy-in or support, especially from the younger generations.

#4 - City of Yokohama, Japan

Yokohama epitomizes the explosive growth experienced by much of the world in the twentieth century, growing from a sleepy village of 600 to a cosmopolitan city of nearly 4 million in only 160 years (Yokohama Visitor's Bureau, 2022). Such growth – exacerbated by natural disasters, wars, and huge technological advances – brings significant resilience challenges to any community, but Yokohama is committed to finding sustainable solutions to their own unique growing pains with an official SDG-based municipal strategy in place since 2018 (City of Yokohama, 2021). From the perspective of the 2021 Report, leadership appears to be dedicated to the achievement of the SDGs on a local level, although their approach is primarily built around high-level, top-down strategies and directives aimed at providing a framework for citizens to follow.

In terms of the national, regional, and local cultural context, Yokohama is on par with other cities in Japan, which has been making significant efforts toward realizing authentic, lasting resilience (UNOSD, 2022). Japan is currently ranked at #18 on the UN's Sustainable Development Index, with 79.8% achievement to date of the 2030 Sustainable Development Goals, with an even mix of success and challenge in realizing full achievement. As shown in Figure 9 below, the country has achieved full compliance with several of the SDGs, such as providing quality education (Goal #4), fostering innovative, sustainable industry (Goal #9), and promoting justice (Goal #16). Sustainability goals in the areas of economic prosperity, public health, and public infrastructure are on track for achievement by 2030, while progress on those related to food and energy systems, consumption habits, social equity, and collaboration are lagging behind what is needed for full achievement. Areas needing the most work – Climate

Action (Goal #13), Life Below Water (Goal #14), and Life On Land (Goal #15) – can be reasonably associated with and understood by the country's unique modern history, showing the impact of war and recovery on the structure of a society and its relationship with the surrounding environment.

Figure 9. SDG Dashboard, Japan (UNOSD, 2022).

Yokohama displays similar evidence of the struggle between structured strategies for human prosperity and well-being and the realization of authentic resilience, ranking quite well on many of the planning indicators within the Envision framework but falling short on the community buy-in needed for successful implementation. When assessed against the 19 selected comparison Envision Credits, Yokohama ranked second-lowest of the five representative communities, achieving a total of 282 out of 358 possible points for the selected engagement-focused credits, or 79% achievement. The city qualified for 65% of the points available in the Quality of Life category, 81% in the Leadership category, and 89% in Climate and Resilience.

Table 4. Envision assessment results – City of Yokohama.

Quality of Life		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
	QL1.1 Improve Community Quality of Life	2	0	0	0	0	2 out of 26
	QL1.2 Enhance Public Health & Safety	0	0	0	0	20	20 out of 20
	QL2.1 Improve Community Mobility Access	0	0	0	0	0	0 out of 14
	QL2.2 Encourage Sustainable Transportation	--	0	0	0	16	16 out of 16
	QL3.1 Advance Equity & Social Justice	0	0	0	0	18	18 out of 18
	QL3.4 Enhance Public Space & Amenities	0	0	0	0	14	14 out of 14

Quality of Life Category Total: **65%** - **70 out of 108**

Leadership		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
	LD1.1 Provide Effective Leadership	0	0	0	18	--	18 out of 18
	LD1.2 Foster Collaboration & Teamwork	0	0	12	0	--	12 out of 18
	LD1.3 Provide for Stakeholder Involvement	0	0	0	0	0	0 out of 18
	LD2.1 Establish a Management Plan	0	0	0	18	--	18 out of 18
	LD2.2 Plan for Sustainable Communities	0	0	0	0	16	16 out of 16
	LD3.1 Stimulate Economic Prosperity	0	0	0	20	--	20 out of 20
	LD3.2 Develop Local Skills & Capabilities	0	0	0	0	16	16 out of 16

Leadership Category Total: **81%** - **100 out of 124**

Climate & Resilience		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
	CR2.1 Avoid Unsuitable Development	0	0	0	0	16	16 out of 16
	CR2.2 Assess Climate Change Vulnerability	0	0	0	20	--	20 out of 20
	CR2.3 Evaluate Risk and Resilience	0	0	24	0	--	24 out of 26
	CR2.4 Establish Resilience Strategies	--	8	0	0	--	8 out of 20
	CR2.5 Maximize Resilience	0	0	0	26	--	26 out of 26
	CR2.6 Improve Infrastructure Integration	0	0	0	0	18	18 out of 18

Climate & Resilience Category Total: **89%** - **112 out of 126**

The City of Yokohama scored moderately well in most community engagement focused Envision indicators, showing strong high-level collaboration and strategy but less effective ground-level engagement and inclusion.

Historically, Japan has a structured, paternalistic culture that continues to transition to one more encouraging of individuality and diversity (Irvin, 2012) and Yokohama's 2021 VLR shows a city that is still struggling to find an effective bridge between old habits and current needs. While both city management and local residents appear to value order and structure, the shifting paradigm of what those concepts mean in modern Japanese culture seem to be causing a disconnect between intention and impact. Efforts toward realizing resilience within Yokohama have so far focused on senior-level decision making, with collaboration limited to partnerships between national, regional, and local government entities and academic institutions. Community engagement appears to be limited to public-private partnerships with a small number of commercial and industrial firms as well as information distribution and government-run pilot programs within the general population. There is no information within Yokohama's 2021 VLR to indicate the public was consulted or included in any mapping exercises, problem identification, decision-making efforts, or direct project implementation.

The Yokohama Visitor's Bureau (2022) indicates that the culture of modern Yokohama has been heavily shaped by Western and Chinese influence, and that the arts play a major role in everyday life for city residents, but the impact or potential benefit of this cultural orientation does not appear to have been considered in any of the programs or policies adopted to date. With a reliance on top-heavy strategizing and decision-making, a lack of identified, authentic public wants or needs, and an informational-only model of engagement, Yokohama's city-wide resilience initiative currently has no visible community buy-in and an uncertain expectation of success or failure.

#5 - City of Vantaa, Finland

The city of Vantaa is the fourth-largest city in Finland, and, rather fittingly, was the fourth city in Finland to submit a VLR, following the format and expectations previously set by Helsinki, Turku, and Espoo. Vantaa's individual resilience journey is still quite young, having only been initiated by the official municipal strategy in 2018. From the perspective of the 2021 Report, however, city leadership appears to be in sync with national goals, sympathetic to the needs of local residents, and fully committed to the objectives of the SDGs.

In terms of the national, regional, and local cultural context, Vantaa is following in the footsteps of its older, larger municipal siblings in Finland. Finland itself leads the global pack in prioritizing resilience, being ranked at #1 on the UN's Sustainable Development Index, with 86% achievement to date of the 2030 Sustainable Development Goals. As shown in Figure 10 below, the country has experienced enviable successes in achieving many of the SDGs, especially in eliminating poverty (Goal #1), providing quality education (Goal #4), supplying adequate water and sanitation (Goal #6), and generating clean energy (Goal #7). Even the leader of the pack has its struggles, though, and Finland is still experiencing moderate to significant challenges in realizing full achievement of some SDGs. Most notably, Finland continues to grabble with emissions, especially when viewed through the lens of imports of goods and services. While improving, the country's progress on eliminating emissions and satisfying the objectives of SDG #13 – Climate Action – is not currently on pace to meet the goals of the UN's 2030 Agenda. Likewise, the consumption habits of a developed country enjoying a generally high quality of life (OECD, 2022) present challenges beyond simple emissions

benchmarks, highlighted by less-than-ideal progress on SDG #12 – Responsible

Consumption and Production. In a country that imports a wide array of consumer goods,

from food to steel (OEC, 2021), these are significant challenges based on individual

consumption habits and expectations that are not easily resolved by high-level strategy

and directives.

Figure 10. SDG Dashboard, Finland (UNOSD, 2022).

Vantaa, while performing admirably for the overall maturity of its resilience

program, appears to be struggling with the same issues seen on the national level. The

city's 2021 VLR indicated strong progress in areas that can be most impacted by high-

level strategy and directive, while those relating to individual behavior are more

challenging. When assessed against the 19 selected comparison Envision Credits, Vantaa

ranked lowest of the five representative communities, achieving a total of 235 out of 358

possible points for the selected engagement-focused credits, or 66% achievement. The

city only managed to qualify for 47% of the points available in the Quality of Life

category, 71% in the Leadership category, and 76% in Climate and Resilience.

Table 5. Envision assessment results – City of Vantaa.

		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
Quality of Life	QL1.1 Improve Community Quality of Life	2	0	0	0	0	2 out of 26
	QL1.2 Enhance Public Health & Safety	0	0	0	0	20	20 out of 20
	QL2.1 Improve Community Mobility Access	0	0	0	0	0	0 out of 14
	QL2.2 Encourage Sustainable Transportation	--	0	0	0	16	16 out of 16
	QL3.1 Advance Equity & Social Justice	0	0	10	0	0	10 out of 18
	QL3.4 Enhance Public Space & Amenities	0	3	0	0	0	3 out of 14

Quality of Life Category Total: **47%** - **51 out of 108**

		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
Leadership	LD1.1 Provide Effective Leadership	0	0	0	18	--	18 out of 18
	LD1.2 Foster Collaboration & Teamwork	0	0	12	0	--	12 out of 18
	LD1.3 Provide for Stakeholder Involvement	0	0	0	0	0	0 out of 18
	LD2.1 Establish a Management Plan	0	0	0	18	--	18 out of 18
	LD2.2 Plan for Sustainable Communities	4	0	0	0	0	4 out of 16
	LD3.1 Stimulate Economic Prosperity	0	0	0	20	--	20 out of 20
	LD3.2 Develop Local Skills & Capabilities	0	0	0	0	16	16 out of 16

Leadership Category Total: **71%** - **88 out of 124**

		Assessment Status					
		Improved	Enhanced	Superior	Conserving	Restorative	Points
Climate & Resilience	CR2.1 Avoid Unsuitable Development	0	0	0	0	16	16 out of 16
	CR2.2 Assess Climate Change Vulnerability	0	0	0	20	--	20 out of 20
	CR2.3 Evaluate Risk and Resilience	0	0	24	0	--	24 out of 26
	CR2.4 Establish Resilience Strategies	--	8	0	0	--	8 out of 20
	CR2.5 Maximize Resilience	0	0	0	26	--	26 out of 26
	CR2.6 Improve Infrastructure Integration	2	0	0	0	0	2 out of 18

Climate & Resilience Category Total: **76%** - **96 out of 126**

The City of Vantaa scored modestly on community engagement focused Envision indicators, showing the struggles of a young resilience program attempting to balance ecological and social objectives in a relatively bureaucratic culture.

Finland, as a whole, enjoys a position of envy among the global community, often finding itself ranked first in lists of educational systems, transparent governance, economic sustainability, and even happiness (Savolainen, 2021). What some native Finns would describe, however, is a culture of limited expectations and resigned acceptance where residents are generally contented, if not necessarily ecstatic, with the government providing what the government will provide (Savolainen, 2021). Vantaa's 2021 VLR highlights how such a culture can prove tricky to navigate, in that the general population is rarely consulted in matters of policy and programs, and when they are, such efforts elicit a lackluster response.

While the title of Vantaa's 2021 VLR was "Sustainable Vantaa Belongs to Everyone," the entire resilience review and recommendation process is currently carried out by a nine-member team from within the city's administrative offices. To be fair, the conclusion of the report did admit to this significant shortcoming, noting:

> During the processing of the report, the need for a more detailed review of the city's sustainable development activities, the development of new indicators and the renewal of the reporting format have been identified as development targets for the report itself. In the future, it would be important to have wide-ranging discussions with departments and units, *as well as to organize open forums* [emphasis added] to ensure that the report contains the most relevant information for achieving the SDGs (City of Vantaa, 2021).

While it is not mentioned so explicitly anywhere in the VLR, it is also evident from the content that city management has, depending on the sector, established few partnerships with community groups, institutions, or agencies; the primary area of collaboration appears to be with the educational system. Until authentic engagement with stakeholders is realized, there is no expectation that program reach and impact will improve. Analysis of future VLRs from Vantaa will undoubtedly provide highly useful updates and insight on the long-term success of Scandinavian community engagement.

Overall Rankings and Observations

After examining the VLR and supporting documentation for each representative city, the level of achievement attained for each of the 19 selected Envision indicators was determined. The associated data was entered into an Excel spreadsheet and sorted, resulting in the following rankings:

1. Orlando - 347 out of 358 points achieved, for 97% achievement

2. São Paulo - 314 out of 358 points achieved, for 88% achievement

3. Subang Jaya - 293 out of 358 points achieved, for 82% achievement

4. Yokohama - 282 out of 358 points achieved, for 79% achievement

5. Vantaa - 235 out of 358 points achieved, for 66% achievement

To better understand the impact and interaction of these scores, charts were created to visualize overall achievement, category achievement, and the statistical correlation between categories, as shown in Figures 11 through 15.
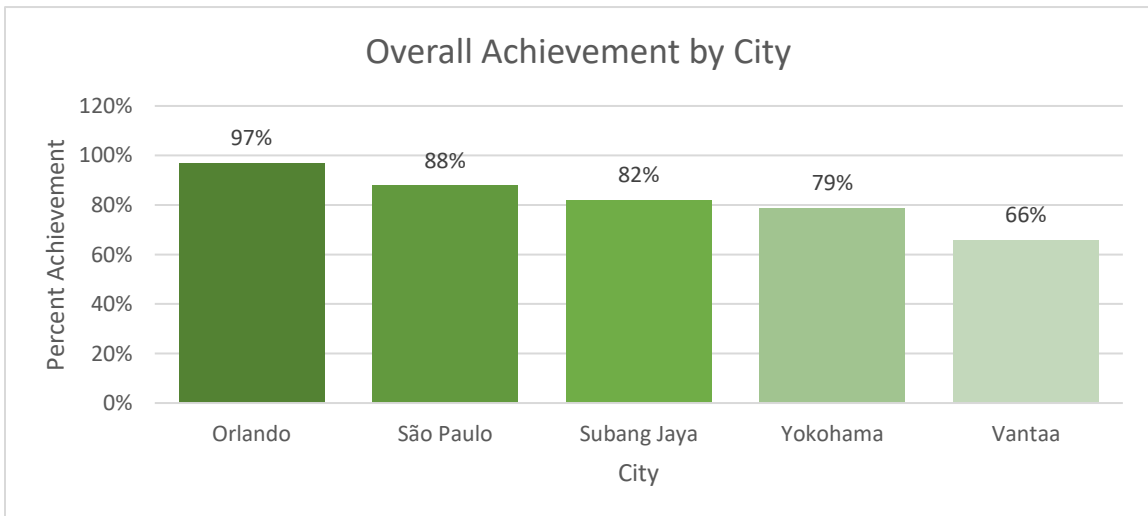
Figure 11. Overall performance of representative communities.
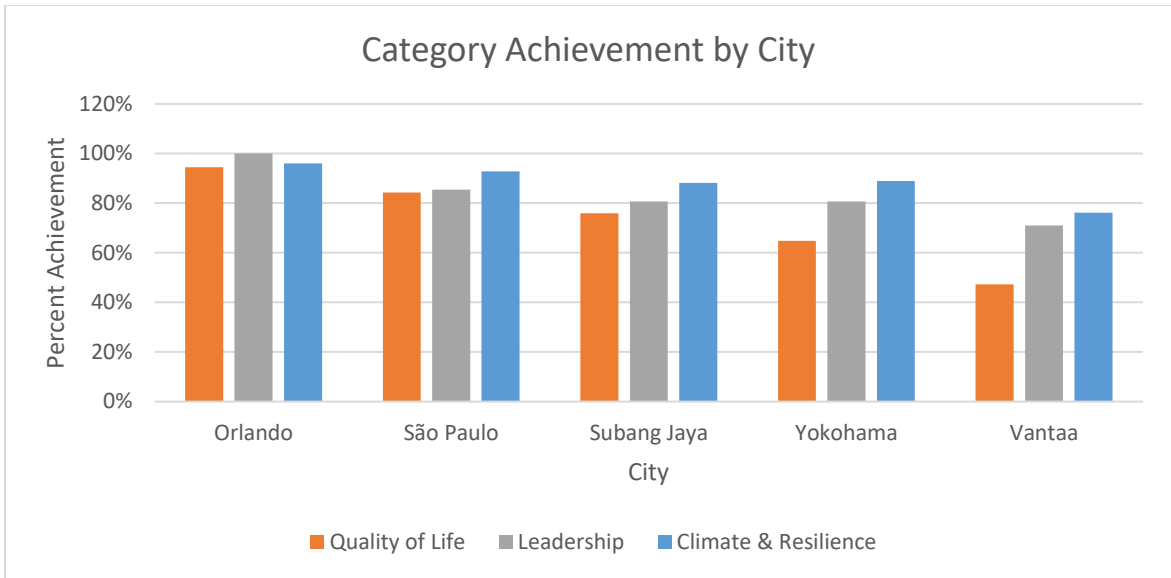
Figure 12. Category performance of representative communities.

As evidenced in Figures 11 and 12, all of the selected Envision categories appear correlated to the final performance score, and the Quality of Life category appears to have the strongest correlation. To further examine these relationships, a simple linear regression analysis was run on all three categories.
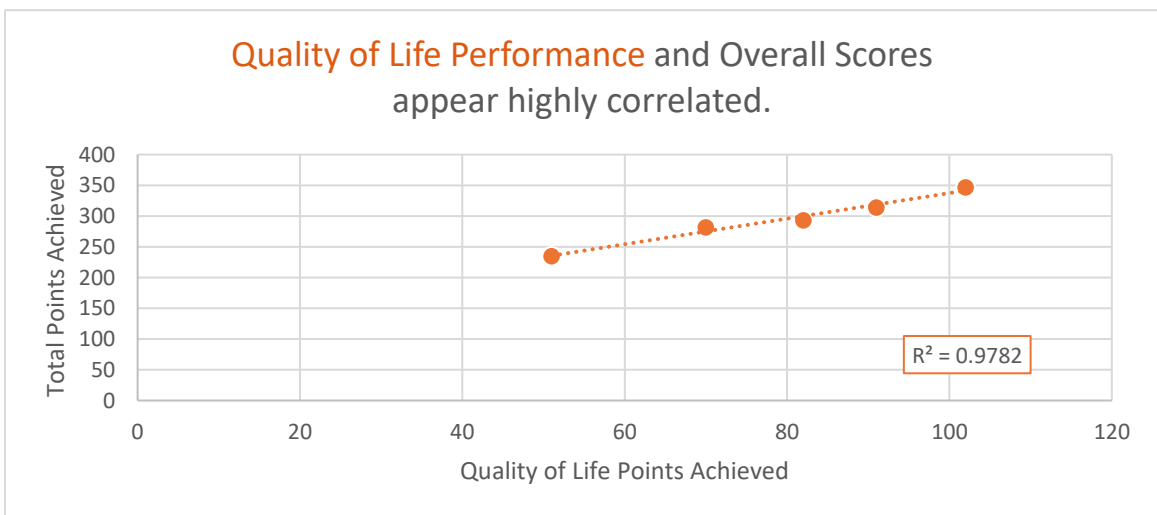
Figure 13. Correlation of Quality of Life indicators with overall score.
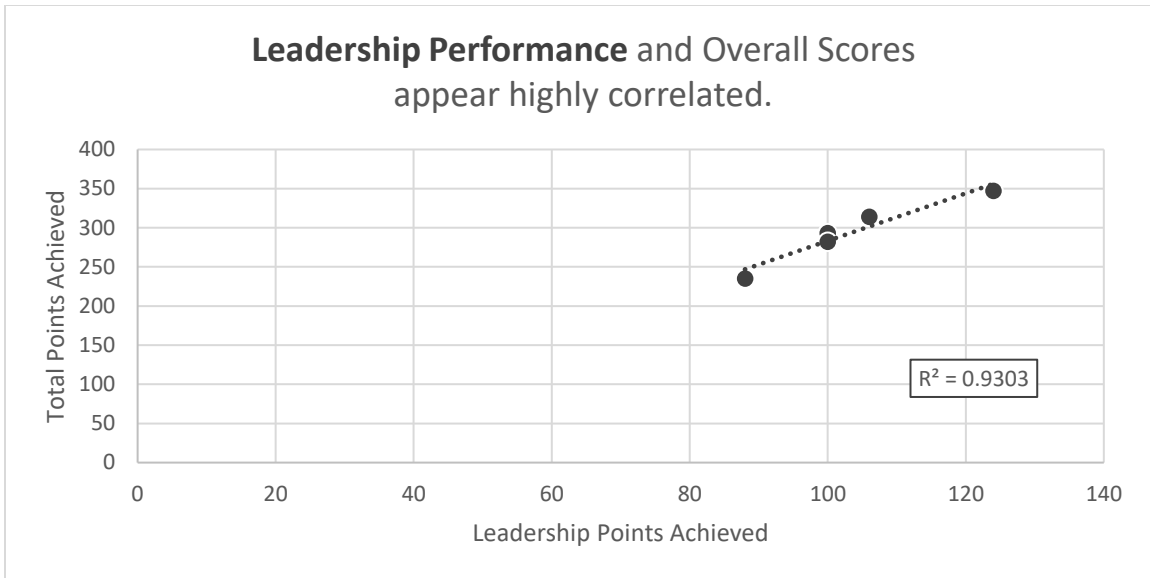
Figure 14. Correlation of Leadership indicators with overall score.
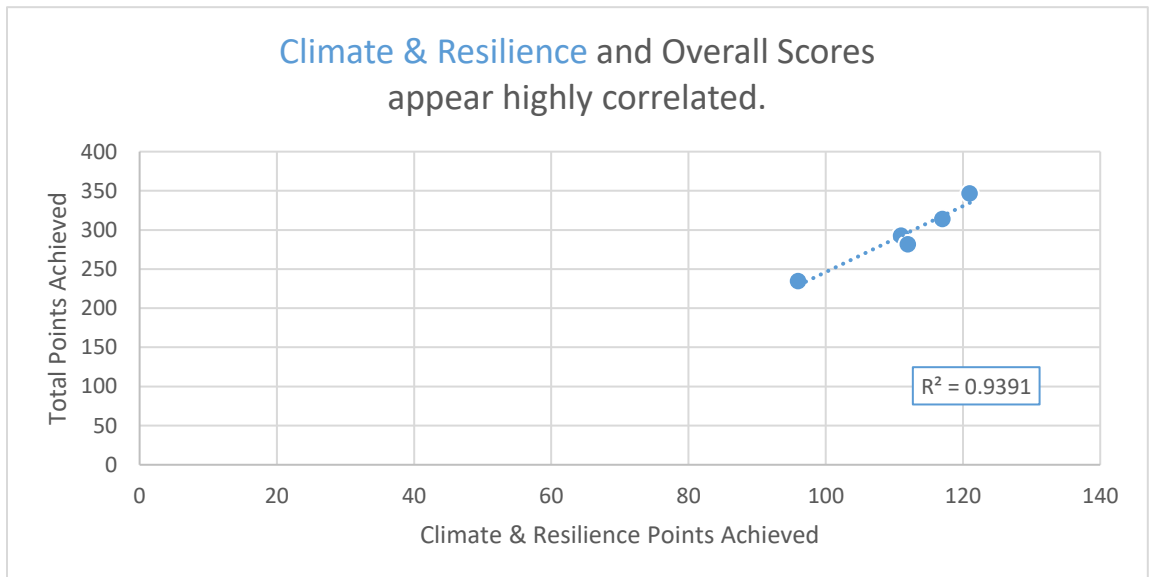
Figure 15. Correlation of Climate & Resilience indicators with overall score.

Quality of Life (Figure 13) did indeed have the strongest correlation with overall performance, with an R-squared value of 0.9782, indicating nearly 98% of the variation in overall performance can be explained by performance in Quality of Life indicators.

Climate and Resilience (Figure 15) had the next strongest correlation with overall performance, with an R-squared value of 0.9391, while Leadership performance (Figure 14) came in at a very close third with an R-squared value of 0.9303. Given that these indicators were chosen for their relevance to the intersection of community engagement and resilience, these relationships make intuitive sense, but seeing the connection in statistical form highlights the importance of when and how stakeholders are engaged.

The city of Vantaa provides an excellent example. While Finland tops the UN Sustainability Index, which is determined by a country's performance against a long list of quantitative benchmarks, the VLR for Vantaa indicated that city officials were struggling to properly identify and determine effective solutions for their remaining resilience issues. It could be reasonably inferred then, that while many SDGs are achievable through largely mechanical means that simply take time and sufficient resources, the SDGs alone do not explain or indicate holistic, authentic resilience for human society. There is another layer, a psychological layer that is less well-suited to measurement and tracking, that ultimately determines success in the "last mile" of resilience efforts. In Vantaa, specifically, where the remaining resilience issues revolve around personal choices and actions, city leadership has struggled to entice residents to make choices that have not been strictly mandated for them. When given the choice, residents still choose convenience and habit – such as products that may contribute to greater emissions but are cheaper or easier to acquire – rather than willingly and intentionally making decisions based on global impact and benefit.

Conversely, Orlando provides an example on the opposite side of the spectrum. The United States lags significantly on SDG achievement in relation to many other

developed nations, but Orlando's VLR indicates the city is enjoying the fruits of a robust, successful resilience initiative. This is true even though the state in which Orlando is located, Florida, could be considered relatively hostile to sustainability and resilience efforts at present (Boda, 2018). The average citizen might not be severely impacted by political jockeying, but leadership in a city the size of Orlando would certainly be subject to pressures from other large municipalities and the state government, and yet they choose to persist with a very progressive set of policies. This is an example of making a willing and intentional choice for wide-scale benefit rather than personal comfort, which can reasonably be attributed to the city's supportive, communicative, and collaborative culture. That culture, then, makes it possible for the city to achieve environmental sustainability goals while strengthening leadership and improving the community's quality of life, even in the face of regional disharmony.

Examination of Hypotheses

When looking at the entire group of representative communities and their experiences as portrayed in the 2021 VLRs, a list of engagement methodologies and their relative efficacy can be established. Given the scale of the initiatives described in the VLRs and the limits to available data, it was not possible to ascertain specific methodology details, but several general practices were evident. These methodologies can be broken down into the following categories, listed in order of apparent efficacy in relation to the representative community's overall resilience program success to date:

- Interactive workshops, such as those frequently utilized in Orlando and coming into use in São Paulo;

- Being both active and collaborative, the engagement in successful interactive workshops is based on common goals and desires, indicating a high level of trust and shared values between organizers and participants.

- Crowdsourced problem-solving, such as that frequently utilized in Orlando, becoming more common in São Paulo, and desired in Vantaa;

  - Being both active and collaborative, the engagement in successful crowdsourced problem identification, decision-making, and solution implementation is based on common goals and desires, indicating significant trust and shared values between organizers and participants.

- Pilot programs, such as those utilized in Yokohama and Orlando;

  - Being active but either collaborative (when participants volunteer freely) or autonomous (when participants are directed or "volunteered"), the engagement in successful pilot programs is based on common goals but with uncertain levels of individual desire. Some trust is assumed, but shared values may or may not be present.

- Public surveys, which were used in all representative communities to some extent;

  - Being active but dependent on individual, autonomous replies, engagement in collecting survey responses is based on an assumption of prior knowledge and the desire to respond. Some trust is assumed, but there is no guarantee of honesty, clarity, or shared values.

- Informational and educational presentations, such as those utilized extensively in Vantaa, Yokohama, and Subang Jaya;

- o Being passive and autonomous, the engagement in and success of educational presentations is based on assumption of a knowledge gap as well as the individual desire to absorb new information, with no guarantee of either trust nor shared values between organizers and participants.
- Government mandates, such as those used in all communities to some extent, and extensively in Subang Jaya and Yokohama;
  - o Being passive and autonomous, the engagement in successful regulation and mandate is based on fear of reprisal. It could be argued that there is a certain level of trust and shared value at play, but only in the sense that participants are driven by the desire to avoid punishment and trust that organizers won't punish them if they follow mandates.

Working backward from these findings, and considering the unique experiences of Orlando, São Paulo, Subang Jaya, Yokohama, and Vantaa, the most effective engagement methodologies for community resilience initiatives do appear to be based on the shared values of a community, though this research was too broad in scale to provide highly detailed recommendations of how to determine or establish shared values. Armed with that insight, however, it becomes evident that organizations should plan to build exploratory actions and activities into the earliest stages of resilience initiatives so as to discover and successfully establish authentic and transparent lines of communication between participants and organizers, identify shared values and sources of or threats to trust, and thus increase community receptiveness and eventual program success.

Chapter IV

Discussion

This research was designed to provide guidance to resilience practitioners attempting to determine how best to engage with their communities and set their programs and projects up for the greatest chance of success. With limited time and resources, the root of the struggle for authentic engagement is the critical need to understand how to motivate the people who make up a community, both individually and collectively, so as to maximize program value and impact. This motivational force, which can vary widely between communities and even between subsectors of any one community, defines and explains the community's perception of and attitudes toward the core issues of resilience, including what they consider an issue of importance and how much long-term support they will provide for resilience projects.

I hypothesized that the more homogenous the motivating factors are in a given community, and the more residents feel supported and valued by their community, the more possible it will be to design a resilience program around those motivations and implement successful projects. As it happens, this very notion is the essence of the Envision framework, which asks not only "Are we doing the project right?" but also, "Are we doing the right project?" (ISI, 2018). When the data currently available fell short of what would be required to create a nuts-and-bolts, algorithmic system for determining when and how to best expend planning and engagement funds, the Envision framework was utilized to complete a comparative analysis of a selection of distinct representative

communities, highlighting crucial best practices and paving the way for further research
and development of a more quantitative tool.

The best practices revealed by this comparative analysis supported the initial
hypotheses presented in this research, namely:

- The perceived overall levels of the variables of "shared values" and "trust" in a
  community correspond positively with the efficacy of project-specific community
  engagement efforts;

- The more investment of time and effort organizations make in ongoing,
  transparent communication, the greater the sense of "trust" and "shared values"
  community stakeholders will have, leading to greater project-specific receptivity
  and efficacy; and,

- Engagement strategies based on the shared values of a given community prove
  most effective.

The most effective and efficient engagement methodologies, as revealed by an
Envision-based analytical comparison of the reported experiences of resilience initiatives
in Orlando, Sao Paulo, Subang Jaya, Yokohama, and Vantaa, were those that were both
active and collaborative, such as interactive problem-solving workshops. The least
effective methodologies were those that may produce a plethora of numbers to flesh out a
grant report, such as survey responses or participants in informational seminars, but
produce very little in the way of community buy-in and support.

Research Limitations

A significant limitation of this research was that, by nature, each community is different, and the experiences of five representative communities do not speak to the unique motivations, expectations, and outcomes that can be reasonably presumed in any individual community. Even within similar geographies, cultures, or situations, every community will be different, and what works in scores of other scenarios has no absolute guarantee of working every time, everywhere. So, this research cannot be taken as a hard-and-fast recommendation to ensure program success. What it can do is highlight certain consistencies seen across cities with, collectively, tens of millions of residents from all around the world, who are seen to behave in similar fashion.

Another limitation is the subjectivity of the analysis. To determine the achievement level of each city's resilience programming in relation to individual Envision indicators, and thus provide a ranking and list of best practices, it was necessary to make admittedly subjective determinations of the intentions, outcomes, and outputs of reported engagement practices, often with less than perfect information. Another analyst might have interpreted the selected VLR documentation differently or might have chosen a different set of representative communities, which could conceivably change the outcome of the research. It is hoped, however, that if anyone else decides to embark on such an undertaking, their unique perspective and findings - based on their own unique lived experience and cultural context - are added to those expressed in this research, for an even richer and more relevant body of knowledge.

Conclusions and Further Recommendations

This research achieved the goals of determining and categorizing engagement methodologies in the resilience sphere in terms of efficacy and efficiency, and it provided a list of recommended best practices to consider when designing and implementing resilience initiatives. Further, it highlighted the value of the Envision framework for use in the evaluation and refinement of all manner of programs and projects, especially when the desired outcome is true and lasting resilience.

It is important to note that the lack of quantitative data which necessitated the pivot in my research design now presents a significant opportunity for improvement for the resilience community, from grassroots community activists to global policy makers – for whom the desire to engender authentic resilience could be considered a shared value. Even the authors of the selected VLRs made note of this opportunity, calling for enhancement of data-tracking and data-sharing systems to improve eventual outcomes (Castro et al., 2021; City of Vantaa, 2021). The design of a simple, user-friendly algorithmic tool to enable even more effective knowledge-sharing and capacity-building between communities is an exciting prospect that could change operating procedure for community organizations and agencies around the world. This is a project that would require considerable research and development, and a higher degree of skill and experience with computational systems than I possess, but its potential value to global resilience cannot be overstated. My experience during this research leads me to believe that a platform such as the Observatory of Economic Complexity (OEC), developed at the Massachusetts Institute of Technology (Simoes, 2012), could provide a reasonable example from which to model such a tool. Whatever the basis, it is my dearest hope that

someone with a passion for both resilience and data programming will take this

recommendation and run with it, in turn improving the resilience of the very

organizations fighting so hard every day for a sustainable future.

QUALITY OF LIFE: WELL-BEING

QL1.1 Improve Community Quality of Life
Levels of Achievement

INTENT

Improve the net quality of life of all communities affected by the project and mitigate negative impacts to communities.

METRIC

Measures taken to assess community needs and improve quality of life while minimizing negative impacts.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		Consideration	Linkages	Alignment	Collaboration	Protection
Community						
Orlando						X

Orlando has identified, considered, and planned to support community needs, while also assessing and planning for the current and future social impacts of their program. The community has been meaningfully engaged in all aspects of the program and is satisfied with overall program performance.

São Paulo						X

São Paulo has identified, considered, and planned to support community needs, while also assessing and planning for the current and future social impacts of their program. The community has been meaningfully engaged in all aspects of the program and is satisfied with overall program performance.

Subang Jaya		X				

Subang Jaya has identified, considered, and planned to support community needs, and has assessed a limited amount of current and future social impacts of their program. The community has not been meaningfully engaged in the design or implementation of the program and community satisfaction cannot be assessed.

Yokohama		X				

Yokohama has identified, considered, and planned to support community needs, and has assessed a limited amount of current and future social impacts of their program. The community has not been meaningfully engaged in the design or implementation of the program and community satisfaction cannot be assessed.

Vantaa		X				

Vantaa has identified, considered, and planned to support community needs, and has assessed a limited amount of current and future social impacts of their program. The community has not been meaningfully engaged in the design or implementation of the program and community satisfaction cannot be assessed.

**Based on Envision Cover Sheets (ISI, 2018); layout modified by Author to suit thesis format.

QL1.2 Enhance Public Health & Safety
Levels of Achievement

INTENT

Protect and enhance community health and safety during operation.

METRIC

Measures taken to increase safety and provide health benefits on the project site, surrounding sites, and the broader community in a just and equitable manner.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		Understanding	Risk Reduction	Improving	Sharing Benefits	Protecting
Community						
Orlando						X

Orlando meets and exceeds minimum health and safety regulations during program operations and improves the health and safety of surrounding areas and broader community. Program risks and impacts are not borne disproportionately by any one community, and the program provides critical services to communities experiencing or at risk of experiencing health and/or safety impacts.

São Paulo						X

São Paulo meets and exceeds minimum health and safety regulations during program operations and improves the health and safety of surrounding areas and broader community. Program risks and impacts are not borne disproportionately by any one community, and the program provides critical services to communities experiencing or at risk of experiencing health and/or safety impacts.

Subang Jaya						X

Subang Jaya meets and exceeds minimum health and safety regulations during program operations and improves the health and safety of surrounding areas and broader community. Program risks and impacts are not borne disproportionately by any one community, and the program provides critical services to communities experiencing or at risk of experiencing health and/or safety impacts.

Yokohama						X

Yokohama meets and exceeds minimum health and safety regulations during program operations and improves the health and safety of surrounding areas and broader community. Program risks and impacts are not borne disproportionately by any one community, and the program provides critical services to communities experiencing or at risk of experiencing health and/or safety impacts.

Vantaa						X

Vantaa meets and exceeds minimum health and safety regulations during program operations and improves the health and safety of surrounding areas and broader community. Program risks and impacts are not borne disproportionately by any one community, and the program provides critical services to communities experiencing or at risk of experiencing health and/or safety impacts.

QL2.1 Improve Community Mobility Access
Levels of Achievement

INTENT
Plan the project as prt of a connected network that supports all transportation modes for the efficient movement of people, goods, and services.

METRIC
The extent to which the project broadens mode choices, reduces commute times, and reduces vehicle distance traveled.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		Coordination	Mitigation	Improved Flow	Networking	Connection
Community						
Orlando						X	

Orlando's resilience program is consistent with local transportation plans and has been designed with input from community stakeholders, including on issues of long-term mobility and access. Strategies are in place to increase capacity and manage congestion.

São Paulo		X				

São Paulo's resilience program is consistent with local transportation plans and includes strategies to increase capacity and manage congestion, but there is no documentation showing the inclusion of input from community stakeholders on this topic.

Subang Jaya						X

Subang Jaya's resilience program is consistent with local transportation plans and has been designed with some input from community stakeholders, including on issues of long-term mobility and access. Strategies are in place to increase capacity, manage congestion, and create new community connections.

Yokohama		X				

Yokohama's resilience program is consistent with local transportation plans and includes strategies to increase capacity and manage congestion, but there is no documentation showing the inclusion of input from community stakeholders on this topic.

Vantaa		X				

Vantaa's resilience program is consistent with local transportation plans, but there is no documentation showing the inclusion of input from community stakeholders on this topic.

QL2.2 Encourage Sustainable Transportation

Levels of Achievement

INTENT
Expand accessibility to sustainable transportation choices including active, shared, and/or mass transportation.

METRIC
The extent to which active, shared, or mass transportation options are accessible, encouraged, and supported as part of a larger integrated transportation network.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		NA	Access	Encouraging	Programming	Connecting
Community						
Orlando						X

Orlando's resilience program provides convenient access to and necessary facilties for active and mass transportation options, and is configured in such a way as to encourage use of those options. The program contribues to a larger, regional active and mass transportation strategy.

São Paulo						X

São Paulo's resilience program provides convenient access to and necessary facilties for active and mass transportation options, and is configured in such a way as to encourage use of those options. The program contribues to a larger, regional active and mass transportation strategy.

Subang Jaya						X

Subang Jaya's resilience program provides needed access to and necessary facilties for active and mass transportation options, and is configured in such a way as to encourage use of those options. The program contribues to a larger, regional active and mass transportation strategy.

Yokohama						X

Yokohama's resilience program provides convenient access to and necessary facilties for active and mass transportation options, and is configured in such a way as to encourage use of those options. The program contribues to a larger, regional active and mass transportation strategy.

Vantaa						X

Vantaa's resilience program provides convenient access to and necessary facilties for active and mass transportation options, and is configured in such a way as to encourage use of those options. The program contribues to a larger, regional active and mass transportation strategy.

QL3.1 Advance Equity and Social Justice

Levels of Achievement

INTENT
Ensure that equity and social justice are fundamental considerations within project processes and decision making.

METRIC
Degree to which equity and social justice are included in stakeholder engagement, project team commitments, and decision making.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		Understanding	Mitigation	Empowerment	Equity	Foresight
Community						
Orlando						X

Orlando has fully considered the historic context and current impact of equity and social justice throughout the stakeholder engagement process, and has assessed social impacts of their resilience program. City leadership is committed to reversing historic inequities and injustice, empowering local communities in the process.

São Paulo						X

São Paulo has fully considered the historic context and current impact of equity and social justice throughout the stakeholder engagement process, and has assessed social impacts of their resilience program. City leadership is committed to reversing historic inequities and injustice, empowering local communities in the process.

Subang Jaya						X

Subang Jaya has considered the historic context and current impact of gender-based inequities, and has assessed related social impacts of their resilience program. City leadership is committed to reversing these trends and has provided some opportunities for local empowerment in the process.

Yokohama						X

Yokohama has considered the historic context and current impact of some equity and social justice issues, and has assessed social impacts of their resilience program. City leadership is committed to reversing historic inequities and injustice and has provided some opportunities for local empowerment in the process.

Vantaa				X		

Vantaa has considered the historic context and current impact of some equity and social justice issues, and has assessed social impacts of their resilience program. City leadership as provided some opportunities for local empowerment in the process.

QL3.4 Enhance Public Space & Amenities
Levels of Achievement

INTENT

Improve amenities and publicly accessible spaces to enhance community livability.

METRIC

Plans and commitments to preserve, conserve, enhance, and/or restore the defining elements of the amenity.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		No Net Loss	Involvement	Improvement	Net Benefit	Restoration
Community						
Orlando						X	

Orlando engaged with and had the support of public stakeholders during the planning process of their resilience program to ensure no net loss of public amenity and create new resources and amenities.

| São Paulo | | | | | X | |

São Paulo engaged with and had the support of public stakeholders in the planning process of their resilience program to ensure no net loss of public amenity and create new resources and amenities.

| Subang Jaya | | | | | | X |

Subang Jaya engaged with and had the support of some public stakeholders in the planning process of their resilience program to ensure no net loss of public amenity, create new resources and amenities, and restore degraded amenities.

| Yokohama | | | | | | X |

Yokohama engaged with and had the support of some public stakeholders in the planning process of their resilience program to ensure no net loss of public amenity, create new resources and amenities, and restore degraded amenities.

| Vantaa | | | X | | | |

Yokohama engaged with and had the support of some public stakeholders in the planning process of their resilience program to ensure no net loss of public amenity.

LD1.1 Provide Effective Leadership
Levels of Achievement

INTENT
Provide effective leadership and commitment to achieve project sustainability goals.

METRIC
The degree to which the project team have made general and project-specific sustainability commitments and instituted sustainability management policies.

Level	None	Improved	Enhanced	Superior	Conserving	Restorative
		Commitment	Strong Commitment	Very Strong Commitment	Core Value	NA
Community						
Orlando					X	

Orlando leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

São Paulo					X	

São Paulo leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

Subang Jaya					X	

Subang Jaya leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

Yokohama					X	

Yokohama leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

Vantaa					X	

Vantaa leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

LD1.2 Foster Collaboration & Teamwork
Levels of Achievement

INTENT
Enhance project sustainability through interdisciplinary collaboration and teamwork.

METRIC
The breadth and inclusivity of interdisciplinary and collaborative meetings and the resulting sustainability performance enhancements.

Level	None	Improved	Enhanced	Superior	Conserving	Restorative
		Collaboration	Shared Goals	Partnerships	Alliances	NA
Community						
Orlando					X	

Orlando leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

São Paulo				X		

Orlando leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

Subang Jaya				X		

Orlando leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

Yokohama				X		

Orlando leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

Vantaa				X		

Orlando leadership has made a clear commitment to sustainability, as evidenced by organizational policies, projects, strategies, and inter-agency agreements.

LD1.3 Provide for Stakeholder Involvement

Levels of Achievement

INTENT

Early and sustained stakeholder engagement and involvement in project decision making.

METRIC

Establishment of sound and meaningful programs for stakeholder identification, early and sustained engagement, and involvement in project decision making.

Level	None	Improved	Enhanced	Superior	Conserving	Restorative
		Active Engagement	Direct Engagement	Involvement	Satisfaction	Partnerships
Community						
Orlando						X

Orlando leadership utilized resource mapping to identify and define stakeholder groups early in the program and established a proactive, transparent, and two-way stakeholder engagement process. Program leads worked directly with stakeholder groups to refine goals, address conflicts, determine satisfaction, and engage stakeholders as partners.

São Paulo						X

São Paulo leadership utilized resource mapping to identify and define stakeholder groups early in the program and established a proactive, transparent, and two-way stakeholder engagement process. Program leads worked directly with stakeholder groups to refine goals, address conflicts, determine satisfaction, and engage stakeholders as partners.

Subang Jaya	X					

Subang Jaya leadership made only a token effort to engage community stakeholders in the goal identification stage.

Yokohama	X					

Yokohama leadership made minimal efforts to engage community stakeholders in the implementation stage.

Vantaa	X					

Vantaa leadership made no documented effort to authentically engage community stakeholders.

LD2.1 Establish a Management Plan

Levels of Achievement

INTENT

Create a project sustainability management plan that can manage the scope, scale, and complexity of a project seeking to improve sustainable performance.

METRIC

Extent of organizational policies, authorities, mechanisms, education, and business processes put in place.

Level	None	Improved	Enhanced	Superior	Conserving	Restorative
		Planning	Strategizing	Implementation	Managing	NA
Community						
Orlando					X	

Orlando has an official, well-delineated, implementable sustainability management plan, aligned with community needs and issues. The plan is regularly reviewed, evaluated, and refined, and is adaptable enough to manage changes in program conditions over time.

São Paulo					X	

São Paulo has an official, well-delineated, implementable sustainability management plan, aligned with community needs and issues. The plan is regularly reviewed, evaluated, and refined, and is adaptable enough to manage changes in program conditions over time.

Subang Jaya					X	

Subang Jaya has an official, well-delineated sustainability management plan, reasonably aligned with perceived community needs and issues. The plan is regularly reviewed, evaluated, and refined, and is adaptable enough to manage changes in program conditions over time.

Yokohama					X	

Yokohama has an official, well-delineated, implementable sustainability management plan, reasonably aligned with perceived community needs and issues. The plan is regularly reviewed, evaluated, and refined, and is adaptable enough to manage changes in program conditions over time.

Vantaa					X	

Orlando has an official, implementable sustainability management plan, aligned with perceived community needs and issues. The plan is regularly reviewed, evaluated, and refined, and is adaptable enough to manage changes in program conditions over time.

LD2.2 Plan for Sustainable Communities

Levels of Achievement

INTENT
Incorporate sustainability principles into project selection/identification in order to develop the most sustainable project for the community.

METRIC
The degree to which project selection/identification includes sustainability performance assessments and is part of a larger sustainable development plan.

Level	None	Improved	Enhanced	Superior	Conserving	Restorative
		Indicators	Alternatives	Assessments	Plans	Developments
Community						
Orlando						X

Orlando's sustainability indicators drive project selection from amongst numerous possible options, and wide-scale project impacts are considered. Projects are developed as part of a cohesive, regional whole to tackle inherently unsustainable conditions in the community.

São Paulo		X				

São Paulo's sustainability indicators drive project selection, and wide-scale project impacts are considered. Documentation did not show consideration of alternative projects, although projects are developed as part of a regional whole to tackle inherently unsustainable conditions in the community.

Subang Jaya						X

Subang Jaya's sustainability indicators drive project selection from amongst several possible options, and wide-scale project impacts are considered. Projects are developed as part of a cohesive, regional whole to tackle inherently unsustainable conditions in the community.

Yokohama						X

Yokohama's sustainability indicators drive project selection from amongst several possible options, and wide-scale project impacts are considered. Projects are developed as part of a cohesive, regional whole to tackle inherently unsustainable conditions in the community.

Vantaa		X				

Vantaa's sustainability indicators drive project selection, and wide-scale project impacts are considered. Documentation did not show consideration of alternative projects, although projects are developed as part of a regional whole to tackle inherently unsustainable conditions in the community.

LD3.1 Stimulate Economic Prosperity

Levels of Achievement

INTENT
Support economic prosperity and sustainable development, including job growth, capacity building, productivity, business attractiveness, and livability.

METRIC
The extent of job creation, increased operating capacity, access, quality, and/or improved socioeconomic conditions.

Level	None	Improved	Enhanced	Superior	Conserving	Restorative
		New Capacity	Improved Choice	New Opportunity	Revitalization	NA
Community						
Orlando					X	

New and better jobs have been created during implementation of Orlando's resilience program, improving choice and access to employment and entrepreneurial opportunity and resources. The program has improved the regional business environment and stimulated resilient growth.

São Paulo					X	

New and better jobs have been created during implementation of São Paulo's resilience program, improving choice and access to employment and entrepreneurial opportunity and resources. The program has improved the regional business environment and stimulated resilient growth.

Subang Jaya					X	

New jobs have been created during implementation of Subang Jaya's resilience program, improving choice and access to employment and entrepreneurial opportunity and resources. The program has improved the regional business environment and stimulated resilient growth.

Yokohama					X	

New jobs have been created during implementation of Yokohama's resilience program, improving choice and access to employment and entrepreneurial opportunity and resources. The program has improved the regional business environment.

Vantaa					X	

New jobs have been created during implementation of Vantaa's resilience program, improving choice and access to employment and entrepreneurial opportunity and resources. The program has improved the regional business environment.

LD3.2 Develop Local Skills and Capabilities

Levels of Achievement

INTENT

Expand the knowledge, skills, and capacity of the community workforce to improve their ability to grow and develop.

METRIC

The inclusion of current and future training programs, informed by skill or capability gaps, and targeted to economically depressed or underemployed communities.

Level	None	Improved	Enhanced	Superior	Conserving	Restorative
		Gaining Skill	Growing Capacity	Building Community	Nurturing Growth	Revitalization
Community						
Orlando						**X**

Orlando's resilience program includes local training programs to fill identified capacity gaps. Community and regional workforce development entities inform training program creation, which is designed to provide local benefit and competitiveness now and into the future, especially for disadvantaged areas.

São Paulo						**X**

São Paulo's resilience program includes local training programs to fill identified capacity gaps. Community and regional workforce development entities inform training program creation, which is designed to provide local benefit and competitiveness now and into the future, especially for disadvantaged areas.

Subang Jaya						**X**

Subang Jaya's resilience program includes local training programs to fill identified capacity gaps. Community and regional workforce development entities inform training program creation, which is designed to provide local benefit and competitiveness now and into the future, especially for women.

Yokohama						**X**

Yokohama's resilience program includes local training programs to fill identified capacity gaps. Community and regional workforce development entities inform training program creation, which is designed to provide local benefit and competitiveness now and into the future, especially for disadvantaged populations.

Vantaa						**X**

Vantaa's resilience program includes local training programs to fill identified capacity gaps. Community and regional workforce development entities inform training program creation, which is designed to provide local benefit and competitiveness now and into the future, especially for disadvantaged areas.

CR2.1 Avoid Unsuitable Development
Levels of Achievement

INTENT
Minimize or avoid development on sites prone to hazards.

METRIC
The degree to which the project is designed and/or sited to avoid or mitigate site-related risks.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		Assessment	Mitigation	Alternatives	Avoidance	Strategic Retreat
Community						
Orlando						X

Orlando has avoided construction on adverse sites and utilizes specific strategies to mitigate project risks from potential site hazards.

São Paulo						X

São Paulo has avoided construction on adverse sites and utilizes specific strategies to mitigate project risks from potential site hazards.

Subang Jaya						X

Subang Jaya has avoided construction on adverse sites and utilizes specific strategies to mitigate project risks from potential site hazards.

Yokohama						X

Yokohama has avoided construction on adverse sites and utilizes specific strategies to mitigate project risks from potential site hazards.

Vantaa						X

Vantaa has avoided construction on adverse sites and utilizes specific strategies to mitigate project risks from potential site hazards.

CR2.2 Assess Climate Vulnerability

Levels of Achievement

INTENT
Develop a comprehensive climate change vulnerability assessment.

METRIC
Scope and comprehensiveness of climate change vulnerability assessment.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		Project-Level	System-Level	Community-Level	Knowledge Sharing	NA
Community						
Orlando					X	

Orlando utilizes a comprehensive climate hazard identification assessment, classifying risks by duration and extent, which is applied to potential resilience projects, connected networks, and surrounding communities. This knowledge is shared widely within and between communities.

São Paulo					X	

São Paulo utilizes a comprehensive climate hazard identification assessment, classifying risks by duration and extent, which is applied to potential resilience projects, connected networks, and surrounding communities. This knowledge is shared widely within and between communities.

Subang Jaya					X	

Subang Jaya utilizes a comprehensive climate hazard identification assessment, classifying risks by duration and extent, which is applied to potential resilience projects, connected networks, and surrounding communities. This knowledge is shared between communities.

Yokohama					X	

Yokohama utilizes a comprehensive climate hazard identification assessment, classifying risks by duration and extent, which is applied to potential resilience projects, connected networks, and surrounding communities. This knowledge is shared between communities.

Vantaa					X	

Vantaa utilizes a comprehensive climate hazard identification assessment, classifying risks by duration and extent, which is applied to potential resilience projects, connected networks, and surrounding communities. This knowledge is shared widely within and between communities.

CR2.3 Evaluate Risk and Resilience

Levels of Achievement

INTENT
Conduct a comprehensive, multihazard risk and resilience evaluation.

METRIC
Scope and comprehensiveness of the multihazard risk and resilience evaluation.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		Project-Level	System-Level	Community-Level	Integration	NA
Community						
Orlando					X	

Orlando's resilience program is defined by the broader metropolitan area and region, including associated infrastructure, networks, and surrounding communities. Comprehensive SWOT analyses are performed by a diverse and integrated team of stakeholders and utilized to enhance program performance.

São Paulo					X	

São Paulo's resilience program is defined by the broader metropolitan area and region, including associated infrastructure, networks, and surrounding communities. Comprehensive SWOT analyses are performed by a diverse and integrated team of stakeholders and utilized to enhance program performance.

Subang Jaya				X		

Subang Jaya's resilience program is defined by the broader metropolitan area and region, including associated infrastructure, networks, and surrounding communities. Comprehensive SWOT analyses are utilized to enhance program performance.

Yokohama				X		

Yokohama's resilience program is defined by the broader metropolitan area and region, including associated infrastructure, networks, and surrounding communities. Comprehensive SWOT analyses are utilized to enhance program performance.

Vantaa				X		

Vantaa's resilience program is defined by the broader metropolitan area and region, including associated infrastructure, networks, and surrounding communities. Comprehensive SWOT analyses are utilized to enhance program performance.

CR2.4 Establish Resilience Strategies

Levels of Achievement

INTENT
To support increased project and community resilience through the establishment of clear objectives and goals.

METRIC
The degree to which resilience goals expand from initial commitments to quantifiable project objectives, long-term operations, and community-wide development plans.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		NA	Strategy	Collaboration	Partnershps	NA
Community						
Orlando					X	

Orlando leadership has performed risk/reward analyses and established management strategies to meet program goals. Key stakeholders are engaged in developing or reviewing resilience goals and strategies, which are aligned with broad, regional goals.

São Paulo					X	

São Paulo leadership has performed risk/reward analyses and established management strategies to meet program goals. Key stakeholders are engaged in developing or reviewing resilience goals and strategies, which are aligned with broad, regional goals.

Subang Jaya					X	

Subang Jaya leadership has performed risk/reward analyses and established management strategies to meet program goals. Key governmental stakeholders are engaged in developing or reviewing resilience goals and strategies, which are aligned with broad, regional goals.

Yokohama			X			

Yokohama leadership has performed risk/reward analyses and established management strategies to meet program goals. There is no documentation to show stakeholder involvement in reviewing goals or strategies, but community-specific goals are aligned with broad, regional goals.

Vantaa			X			

Vantaa leadership has performed risk/reward analyses and established management strategies to meet program goals. There is no documentation to show stakeholder involvement in reviewing goals or strategies, but community-specific goals are aligned with broad, regional goals.

CR2.5 Maximize Resilience

Levels of Achievement

INTENT
Increase resilience, life-cycle system performance, and the ability to withstand hazards by maximizing durability.

METRIC
The degree to which the project incorporates elements that increase durability, the ability to withstand hazards, and extend useful life.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		Improved Resilience	Thorough Implementation	Resilience Monitoring	Quantifying Improvement	NA
Community						
Orlando					X	

Orlando's resilience goals and strategies build on detailed risk assessments, and resilience is viewed comprehensively. Implementation is reviewed and monitored regularly, with resilience at the forefront of operations and maintenance of projects. Program benefits are measured.

São Paulo					X	

São Paulo's resilience goals and strategies build on detailed risk assessments, and resilience is viewed comprehensively. Implementation is reviewed and monitored regularly, with resilience at the forefront of operations and maintenance of projects. Program benefits are measured.

Subang Jaya					X	

Subang Jaya's resilience goals and strategies build on detailed risk assessments, and resilience is viewed comprehensively. Implementation is reviewed and monitored regularly, with resilience at the forefront of operations and maintenance of projects. Program benefits are measured.

Yokohama					X	

Yokohama's resilience goals and strategies build on detailed risk assessments, and resilience is viewed comprehensively. Implementation is reviewed and monitored regularly, with resilience at the forefront of operations and maintenance of projects. Program benefits are measured.

Vantaa					X	

Vantaa's resilience goals and strategies build on detailed risk assessments, and resilience is viewed comprehensively. Implementation is reviewed and monitored regularly, with resilience at the forefront of operations and maintenance of projects. Program benefits are measured.

CR2.6 Improve Infrastructure Integration

Levels of Achievement

INTENT
Enhance the operational relationships and strengthen the functional integration of the project into connected, efficient, and diverse infrastructure systems.

METRIC
The degree to which the project is integrated into other connected systems, where beneficial and appropriate, in order to increase resilience and systems performance.

Levels	None	Improved	Enhanced	Superior	Conserving	Restorative
		Internal Integration	Risk Reduction	Systems Integration	Network Integration	Information Integration
Community						
Orlando						X	

Orlando's resilience program integrates internal systems for efficiency and risk reduction, leveraging its position within a larger infrastructure system, and integrating varied infrastructure networks, to achieve even greater gains.

São Paulo				X		

São Paulo's resilience program integrates internal systems for efficiency and risk reduction, leveraging its position within a larger infrastructure system to achieve even greater gains.

Subang Jaya			X			

Subang Jaya's resilience program integrates internal systems for efficiency and risk reduction.

Yokohama						X

Yokohama's resilience program integrates internal systems for efficiency and risk reduction, leveraging its position within a larger infrastructure system to achieve even greater gains. The program integrates varied infrastructure networks, and utilizes monitoring and reporting systems to improve performance over time.

Vantaa		X				

Vantaa's resilience program integrates internal systems for efficiency.

Example: Envision Credit Guidance

QUALITY OF LIFE: WELLBEING

QL1.1 Improve Community Quality of Life

26 POINTS	**INTENT** Improve the net quality of life of all communities affected by the project and mitigate negative impacts to communities.	**METRIC** Measures taken to assess community needs and improve quality of life while minimizing negative impacts.

LEVELS OF ACHIEVEMENT

IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
A + B	A + B + C + D	A + B + C + D + E	A + B + C + D + E + F	A + B + C + D + E + F + G
(2) Community Considerations	(5) Community Linkages	(10) Broad Community Alignment	(20) Holistic Assessment & Collaboration	(26) Protecting The Future

(A) The project team identifies and takes into account community needs, goals, and issues. For example, the project team has located and reviewed the most recent community planning information and assessed relevant community needs, goals, and/or issues.

(B) The project meets or supports community needs and/or goals.

(C) The project assesses the social impacts it will have on the host and affected communities' quality of life.

(D) The affected communities are meaningfully engaged in identifying how the project supports community needs and/or goals.

(E) Based on the social assessment, potential negative impacts on the host or nearby affected communities are mitigated following a hierarchy that prioritizes avoidance, minimization, restoration, and offsetting.

(F) Community satisfaction is demonstrated by feedback from the stakeholder engagement process verifying actions taken in criteria A, B, C, and D.

(G) The project proactively addresses trends in changing social, economic, and/or environmental conditions within the community in order to ensure a high quality of life over the long term.

DESCRIPTION

This credit addresses the extent to which a project contributes to the quality of life of the host and affected communities. As this can be subjective, the credit criteria address how well the project team has identified, assessed, and incorporated community needs, goals, and issues into the project. Relevant community plans are assumed to be a viable expression of those needs, goals, objectives, and aspirations. In a real sense, they are the community's desired quality of life.

Unfortunately, infrastructure projects are often perceived as having negative impacts on communities. This "not in my back yard" (NIMBY) mentality can be addressed through active engagement and the proper alignment of projects with community needs, goals, and issues. Community support and engagement are critical to ensure the appropriate and effective investment of resources in infrastructure. Project teams and owners should consider how aligning the project with community goals reduces the risk of community conflicts that disrupt project delivery and increase cost.

LD1.1 Provide Effective Leadership and Commitment

18 POINTS	**INTENT** Provide effective leadership and commitment to achieve project sustainability goals.	**METRIC** The degree to which the project owner and project team have made general, and project-specific, sustainability commitments and instituted sustainability management policies.

LEVELS OF ACHIEVEMENT

IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
A	A + B	A + B + C	A + B + C + D	Not Available
(2) Initial Commitment	(5) Strong Commitment	(12) Strong Commitment	(18) Sustainability As A Core Value	
(A) A written commitment by the owner and project team to address the social, environmental, and economic aspects of the project. Commitments to sustainability are clearly articulated at the project level in a project chartering session and/or contract documents.				
	(B) Commitments are supported by a sustainability management policy that is commensurate with the scope, scale, and complexity of the project.			
		(C) Sustainability commitments, and progress toward their achievement, are revisited periodically through meetings or written reports.		
			(D) Key members of the project team have made clear commitments to sustainability, as evidenced by: • Organizational sustainability policies and/or reports. • Examples of projects, or initiatives, to improve sustainable performance. • Sustainability strategies embedded into their business strategy. • Third-party organizational recognition or commitments.	

DESCRIPTION

This credit addresses establishing strong leadership to adequately and competently address issues surrounding sustainability in all phases of the project. This credit assesses the degree to which various members of the project team have committed to making sustainability a priority within their respective organizations as well as the project itself. Project teams will be able to better serve the community when they are led and managed by people and organizations that have a strong commitment to the principles of sustainability and have demonstrated the ability to effectively incorporate these principles into projects.

Projects are more likely to achieve sustainable outcomes when owners, designers, contractors, and all involved in the project team make strong commitments to achieve sustainability goals. Conversely, project performance is most at risk when sustainability is considered an add-on or lower-priority objective.

Many Leadership credits reference the importance of decision making and collaboration within the "project team." The nature of the project team will depend on several factors, including the project delivery method. The intention of referencing the project team is to capture major decision makers involved in the project, as well as those who act as primary advisors, consultants, or specialists on behalf of decision makers. This will almost always include the project owner, those who act as lead designers (engineers, architects, landscape architects, etc.), and those who manage and execute the project through construction, but ideally would also include those responsible for funding, operating, regulating, subconsulting, or otherwise utilizing the project (e.g., community groups). Those with the responsibility and authority to implement sustainability efforts should coordinate to ensure their effectiveness. Envision users should take time to review the organizational hierarchy of the project in order to identify at which levels key decisions regarding project sustainability are being made. This will constitute the starting point of defining the project team.

CR2.1 Avoid Unsuitable Development

16 POINTS	**INTENT** Minimize or avoid development on sites prone to hazards.	**METRIC** The degree to which the project is designed and/or sited to avoid or mitigate site-related risks.

LEVELS OF ACHIEVEMENT

IMPROVED	ENHANCED	SUPERIOR	CONSERVING	RESTORATIVE
A + B	A + B + C	A + B + C + D	A + B + C + E	A + B + C + F
(3) Alternative Assessment	(6) Risk Mitigation	(8) Lowest Risk Alternative	(12) Unsuitable Development Avoided	(16) Strategic Retreat

(A) During planning and project siting, the project team identifies potential siting hazards and determines both the vulnerability of the project to the hazard and the potential for the project to exacerbate the hazard (e.g., creating impervious surfaces in a floodplain, building on potentially unstable hillsides). Potentially adverse sites include but are not limited to:

- Steep slopes (> 20 degrees)
- Permafrost
- Adverse geology (e.g., risk of liquefaction, subsidence, or sinkholes)
- Flood-prone areas
- At-risk coastline (coastal surges, coastal erosion)

(B) The project team assesses siting alternatives that avoid or minimize hazard exposure and/or project alternatives less vulnerable to, or likely to exacerbate, site hazards.

(C) The project includes specific strategies to mitigate the impact of site hazards on the project (e.g., elevating structures and equipment above flood levels), as well as the project development impacts on the site hazard (e.g., erosion controls on steep slopes). This may include monitoring and response plans.

(D) Based on alternatives identified in criterion C, the project team can demonstrate the selected project and site resulting in the lowest exposure to site risk while still meeting project objectives and requirements.	**(E)** The project is intentionally sited to completely avoid site hazards.	**(F)** The project intentionally modifies or removes existing structures from areas prone to frequent damage and/or at high risk of future damage in order to prevent losses.

DESCRIPTION

This credit addresses how infrastructure siting can significantly reduce risk and improve project resilience. Certain sites such as steep slopes, permafrost, or flood-prone areas should be avoided if possible. Project teams must consider how certain sites not only expose the infrastructure asset to increased risk, but how the development of the project on these sites can lead to additional environmental, social, or economic risks for the surrounding area. For example, a project located on a steep slope is not only at risk itself, but may contribute to erosion or the potential for landslides. Project teams should also consider how infrastructure development may lead to additional development within the at-risk areas.

Whenever possible, infrastructure should avoid developing, or driving development, in areas prone to hazards. Many communities may even consider strategic or managed retreat. This is the systematic withdrawal and removal of development from areas prone to damage (e.g., frequent flood zones) or at risk of future damage (e.g., low-lying coastal areas impacted by sea-level rise).

*Full Guidance for all Envision Credits and the Envision Rating System are available for review at https://sustainableinfrastructure.org/envision/use-envision/

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