

SHRINKING CITIES: A SUSTAINABILITY ASSESSMENT OF ECO-URBANISM STRATEGIES

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INTRODUCTION

St. Louis as a Shrinking City

Shrinking cities are characterized by "the decline of urban population and economic activity... it results in excess spaces, buildings, and obsolete properties... Shrinkage is a form of urban transformation that occurs in a radical manner without any initial changes in the local physical space in which it takes place."¹ Pendall,² calls this process "thinning", while Rae,³ defines the shrinking city as "undercrowded", defined by both population loss and persistent and widespread housing vacancy.

St. Louis ranked #1 in the top 25 most declining cities in the Northeast and Midwest, 1950-2000.⁴ In 2012 the estimated population of St. Louis was 318,172,⁵ a decline of approximately 63% from its peak of 856,796⁶ in 1950. This exodus was the result of a combination of factors such as deindustrialization, suburbanization, and white flight.⁷ Disjointed areas, reflected as unplanned, abandoned and vacant land in the urban fabric with vacant buildings in various stages of decay, are a result of this decrease in population density, and stand witness to the city's sustained demographic loss for over 60 years.⁸

Today, St. Louis experiences many of the common problems of shrinking cities, including job losses in the metro area in every industry except education and health services,⁹ countless complaints of weeds, illegal dumping and rodent infestation,¹⁰ food deserts in a large percentage of the city neighborhoods,¹¹ and high violent crime rate.¹² In 2012, the city declared approximately \$1.5 million in Total Direct and Overlapping Debt.¹³ As the city becomes more unattractive, the people who can afford leaving, move out.¹⁴ ¹⁵ This is evidenced by the US Census Bureau Data,¹⁶ which reflects a high and increasing percentages of the poor, handicapped and elderly within the remaining population. Consequently, the fiscal difficulties associated with a reduced tax based become apparent, as the city cannot afford its own upkeep.¹⁷

Eco-Urbanism in St. Louis

"The widespread demolition of urban fabric suggested another urban design alternative: that large areas of the shrinking city might ultimately become a new form of landscape, with natural areas, suburban lawns, and even urban farms."¹⁸ The eco-urbanism movement replaces the traditional mindset and goals of economic growth and expansion with sustainability and improved quality of life. The transformation of vacant plots into socially inclusive and environmentally sensitive proposals becomes an attractive and viable option due to the availability of abandoned land at low prices.¹⁹

Eco-urbanism strategies have become increasingly relevant in St. Louis, most notably reflected in the City of St. Louis Sustainability Plan (STLSP) 2013. From the non-profit sector, Gateway Greening and the

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Great Rivers Greenway District have also played a central role in promoting eco-urbanism strategies in the forms of community gardens and greenways, respectively.

In addition, growing interest in the eco-urbanism movement is also evident in the project brief of recent competitions for the city of St. Louis. The Pruitt-Igoe Now competition called for design ideas that could re-imagine the 57-acres site that once held the infamous Pruitt-Igoe public housing project.²⁰ In 2012, Washington University in St. Louis, in partnership with the City of St. Louis, organized the Sustainable Land Lab Competition (SLLC). The competition brief called for "innovative projects that can transform vacant lots into assets that advance sustainability."²¹ In 2013, the Sustainable Neighborhood Small Grant Competition (SNSGC) was launched by the City of St. Louis. The competition was an opportunity for neighborhood organizations, individuals, religious organizations and community groups to propose projects that would help improve livability and enhance quality of life at a local level.²² Many of the proposals submitted in the three cases, including the Pruitt-Igoe Now competition that did not explicitly stress sustainability, integrated eco-urbanism strategies.

The City of St. Louis Sustainability Plan

On January 9, 2013, St. Louis City officially adopted the City of St. Louis Sustainability Plan (STLSP). The Plan aims to gear the city towards triple bottom line (TBL) sustainability by emphasizing a holistic and comprehensive response that seeks economic prosperity, social equity and environmental health through a series of suggested strategies.²³ Eco-urbanism strategies such as greenways, parks and community gardens were included in the plan as viable alternatives to vacant land.

To move this plan forward, the City of St. Louis decided to participate as one of the ten pilot cities whose sustainability efforts are currently being compiled, assess and report under the Sustainability Tool for Assessing & Rating (STAR) Community Rating System, a national sustainability framework, rating system, and software platform. STAR weighs community level outcomes and the implementation and preparation of local actions, against a set of standardized sustainability objectives for evaluating, quantifying and improving the livability and sustainability of US communities.²⁴ The involvement of the Mayor's office with initiatives such as the SLLC and SNSGC were also part of this effort.

The Sustainable Land Lab Competition

Between November 2012 and April 2013, the Sustainability Office organized the first Sustainable Land Lab Competition (SLLC). The competition was part of the Sustainable Cities Conference co-organized by the Mayor's Office and the Sustainability Office of Washington University in St. Louis. The competition invited teams to transform vacant land into two-year lease living laboratories showcasing innovative ideas and integrated strategies for transforming vacancy, one of St. Louis region's greatest challenges. Competition entries were encouraged to meet TBL sustainability as defined in the STLSP. It then provided seed funding to kick-start the implementation of finalist projects under the Sustainable Land Lab initiative. Old North St. Louis (ONSL) was chosen as the pilot neighborhood, with the Sustainability Office working closely with the Old North St. Louis Restoration Group (ONSLRG), a non-profit organization pursuing a comprehensive revitalization plan for the neighborhood.

On April 9, 2013, six projects were selected to proceed on five lots (two finalists merged their projects

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due to synergies in their approach): Our Farm (Bistro Box/ Renewing Roots Urban Farm), Chess Pocket Park, Mighty Mississippians, Sunflower+ Projects, and HUB: Hybrid Urban Bioscapes.

ESTABLISHING A METHODOLOGY

Projects

Projects for this study were selected based on location; as a criterion the physical site was required to fall within the neighborhood boundary. This ensured that projects not only could affect local residents, but also could in turn be affected by the local residents themselves. Projects were identified and classified based on whether the strategies used fit either one or both eco-urbanism categories.

Eco-urbanism strategies	
Productive Landscapes	Recreation & Leisure Areas
Community (vegetable) garden	Riparian floodplain
Pollinator nectaring garden	Waterfront/watercourses
Flower garden	Plaza/quadrangle/Sitting area
Fruit tree	Playground
Apiary	Recreational trail/ Greenway
Livestock breeding ground	Street art
Poultry farm	Sports field
Organic composting area	Dog park
Remediation/brownfield reclamation	Pocket park
Stormwater management	Urban forest/Woodland
Biofuel production site	Wildlife observation

Table 1. Eco-urbanism strategies.²⁵

Sustainable Land Lab

As a result of the SLLC, five proposals were selected to be implemented in ONSL: Our Farm (former Bistro Box and Renewing Roots Urban Farm), Chess Pocket Park, Mighty Mississippians, Sunflower+ Projects, and HUB: Hybrid Urban Bioscapes.

Our Farm consists of a small restaurant built from surplus cargo containers (Bistro Box), and a scalable urban agricultural network (Renewing Roots Urban Farm). Agricultural produce from the site is to be used in the restaurant. As of today, only the greenhouse has been implemented. Chess Pocket Park provides a permanent outdoors community chess venue. Through providing recreational activities and fostering community interaction, it seeks to increase the residents' quality of life. Thus far, construction of the project has not started.

Mighty Mississippians provides a modern agricultural and sustainable living model, based on regional history, as well as modern permaculture practices. The project heavily emphasizes educational outreach, through demonstrations and community involvement. The Sunflower+ Project explores bioremediation via the growing of sunflowers. The goal is to turn vacant lots into attractive sites for redevelopment. In

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addition, the sunflowers produced in the process can be sold.

HUB: Hybrid Urban Bioscapes proposes a pollinator nectaring garden and a community gathering space. The nectaring gardens aims to increase productivity of the nearby community vegetable gardens by fostering pollinator presence, while the gathering space allows for community interaction. Currently, the gardens are complete, while construction of the gathering space is still in progress. Under Freixas & Moyano's Eco-urbanism Strategies Chart²⁶, all five projects were categorized according to their proposed strategies.

Eco-urbanism strategies	Sustainable Land Lab				
	Our Farm (Bistro Box + RR Farm)	Chess Pocket Park	Mighty Mississippi ans	Sunflower+ Project	HUB: Hybrid Urban Bioscapes
Productive Landscapes					
Community (vegetable) garden	x		x		x
Pollinator nectaring garden					x
Flower garden			x	x	x
Fruit tree			x		x
Apiary					
Livestock breeding ground					
Poultry farm					
Organic composting area	x				
Remediation				x	
Stormwater management	x	x	x		x
Biofuel production site				x	
Solar cell farm	x				
Wind farm					
Recreation and Leisure Areas					
Riparian Floodplain					
Waterfront					
Plaza/Quadrangle/Sitting areas	x	x		x	x
Playground					x
Recreational trail & Greenway					x
Street Art			x		
Sports field		x			
Dog park					
Park/ Pocket park		x			
Urban Forest/Woodland					
Wildlife observation					x
Bird watching					
Fishing					

Table 2. Sustainable Land Lab Competition. Eco-urbanism Strategies.²⁷

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Other Eco-urbanism Projects

There are a total of nine other identified eco-urbanism strategies in ONSL (excluding those under the SLLC). Each project's amenities and affiliation was identified as a first step in the categorization of these projects as productive landscapes and/or leisure and recreation activities.

Location	Name	Affiliation	Amenities
2714 N 13th St.	13th Street Community Garden - Hub Garden	Gateway Greening	Community vegetable garden Fruit trees Pollinator nectaring garden Hoop house Poultry farming Rainwater Management Organic Composting Sitting area Playground Tool shed
1501 Hebert St.	Hebert Community Garden	Gateway Greening	Flower garden Trees Arbor Sitting area
1100 St. Louis Ave.	Ames VPA Butterfly Garden	Gateway Greening Ames VPA Elementary School	Pollinator nectaring garden Sitting area Sculpture
1430 &1444 St. Louis Ave.	Old North St. Louis Community Garden	Gateway Greening	Flower garden
1225 Warren St.	Haven of Grace Garden	Gateway Greening The Haven of Grace	Vegetable Garden (not in use) Flower Garden Sitting area Sculpture
1450 Monroe St.	Kabot Farm House Community Garden	Gateway Greening	Vegetable Garden Fruit trees Poultry farming Organic Composting
1406 Dodier St	Wingmann Park		Flower garden Trees Sitting Area
1323 Clinton Street	Old North St. Louis Rain Garden	Metropolitan Sewer District	Rain Water garden
1301 St. Louis Ave.	Northside Workshop Garden	Northside Workshop	Vegetable garden Flower garden Apiaries Organic composting area

Table 3. Other Eco-urbanism Projects in ONSL.

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Eco-urbanism strategies	ONSL Community Gardens								
	2714 N 13th St.	1501 Hebert St.	1100 St. Louis Ave.	1430 & 1444 St. Louis Ave.	1225 Warren St.	1450 Monroe St.	1406 Dodier St.	1323 Clinton Street	1301 St. Louis Ave.
Productive Landscapes									
Community garden	x	x				x			x
Poll. nectar. garden			x						
Flower garden	x	x		x			x		x
Fruit tree	x					x			
Apiary									x
Livestock breeding									
Poultry farm	x					x			
Org. compost area	x					x			x
Remediation									
Stormwater managem.	x							x	
Biofuel prod. sites									
Solar cell farm									
Wind farm									
Recreation and Leisure Areas									
Plaza/quadr./Sit.	x	x	x				x		
Playground	x								
Recr. trail/greenway									
Street Art			x						
Sport field									
Dog park									
Park/Pocket park									
Urb. forest/Woodland									
Wildlife observation									
Bird watching									
Fishing									

Table 4. Eco-urbanism Strategies in ONSL Projects.

Indicators

An indicator is an easily identified feature of a society that can be measured, changes over time, and is taken as revealing some underlying aspect of social reality.²⁸ Commonly used indicators are those that are derived from official statistics (material) and from community values and goals (immaterial),²⁹ and lead to specific quantitative or qualitative measuring tools, respectively.

Projects are to be assessed based on a series of indicators developed under the lens of the TBL sustainability. In developing these indicators, the study first reorganized the seven functional categories of the STLSP under the TBL. The relative importance of the category weighed on the TBL goals

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determined its association and position in the matrix.³⁰ The seven goal areas of STAR were then studied using the same process, while cross-referencing them with the functional categories of the STLSP. STAR provided methods for measuring these indicators.³¹ Last, indicators for the study were defined in each dimension of sustainability (social equity, environmental health, and economic prosperity) based on the above to fit the neighborhood scale addressed by the present study.

TBL Goal	Functional Categories in City St. Louis Sustainability Plan ³²	Goals in STAR ³³	Indicators for Methods
Social Equity	Health, Well-being, & Safety: 1. Encourage Physical Activity, Fitness, and Recreation 2. Advance Positive Behavior, Nonviolent Conflict Resolution, and Crime Prevention 3. Increase Access to Healthy, Local Food, and Nutritional Information	Health & Safety: 1. Active Living 2. Safe Communities Food Access & Nutrition	Health & Safety: 1. Physical Activity 2. Crime & Perception of Safety 3. Availability of Healthy Food
	Urban Character, Vitality & Ecology Arts, Culture & Innovation Empowerment, Diversity & Equity: 1. Encourage Civic Engagement, Transparency, and Leadership Education, Training & Leadership: 1. Nurture Leadership and Management Capabilities in Business, Government, and Neighborhoods	Education, Arts & Community: 1. Community Cohesion Equity & Empowerment: Civic Engagement	Community Building: 1. Neighborhood Pride & Satisfaction 2. Beautification /Aesthetics 3. Civic Engagement 4. Outside Partnerships 5. Local Leader Development
	Urban Character, Vitality & Ecology: 1. Preserve the City's Historically and Architecturally Significant Districts, Buildings, Landmarks, and Landscapes Arts, Culture & Innovation Empowerment, Diversity & Equity: 1. Promote Youth Development, Education, Engagement, & Empowerment Education, Training & Leadership	Education, Arts & Community: 1. Historic Preservation 2. Educational Opportunity & Attainment Economy & Jobs: Workforce Readiness	Education: 1. Local History Awareness, Education & Appreciation 2. Skill Development 3. Participation in Educational Activities

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Environmental Health	<p>Education, Training & Leadership: 1. Increase Environmental Literacy</p> <p>Urban Character, Vitality & Ecology: 1. Strengthen Use, Access and Programming of Civic Amenities, Public Spaces, and Streets 2. Support and increase the City's Greenscape, including its Existing Park System and Urban Tree Canopy</p>	<p>Built Environment: Public Spaces</p>	<p>Eco-Appreciation: 1. Eco-Literacy 2. Connection between Person & Environment 3. Intentional Open/Park Space</p>
	<p>Health, Well-Being & Safety: 1. Reduce Toxins in the Environment 2. Promote Energy Efficiency and Utilize Cleaner Forms of Energy 3. Minimize Landfill-Bound Waste</p>	<p>Climate & Energy: 1. Waste Minimization 2. Greening the Energy Supply</p> <p>Equity & Empowerment: Environmental Justice</p>	<p>Environmental Improvement: 1. Toxin Removal 2. Litter Reduction 3. Waste Reduction 4. Use of Alternative Energy</p>
	<p>Urban Character, Vitality & Ecology: 1. Promote Urban Conservation and Revitalization of the City's Unique Biodiversity and Natural Resources</p> <p>Infrastructure, Facilities & Transportation 1. Reduce Greenhouse Gas Emissions 2. Manage Stormwater and Wastewater to Protect and Enhance Property and Natural Systems 3. Advance Health and Resource Efficiency in Buildings</p>	<p>Built Environment: 1. Community Water Systems</p> <p>Climate & Energy: 1. Greenhouse Gas Mitigation 2. Resource Efficient Buildings 3. Resource Efficient Public Infrastructure</p> <p>Natural Systems: 1. Green Infrastructure 2. Invasive Species 3. Natural Resource Protection Water in the Environment</p>	<p>Eco-System Management: 1. Local Biodiversity 2. Use of Local Materials 3. Greenhouse Gas Mitigation 4. Stormwater Management</p>
Economic Prosperity			<p>Cost-Benefit Analyses of New Projects: 1. Startup Costs 2. Costs of Leaving Land</p>

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			Vacant 3. Local Tax Revenue 4. Operation Costs 5. Direct Income
	Urban Character, Vitality & Ecology: 1. Support Designated Districts that Focus on Job Creation and Economic Prosperity Prosperity, Opportunity & Employment	Built Environment: 1. Infill & Redevelopment Economy & Jobs: 1. Business Retention & Development 2. Local Economy Quality Jobs & Living Wages	Neighborhood Capital: 1. Reinvestment/ Redevelopment 2. Job Creation

Table 5. Developing Indicators.

Methods

Four methods of measuring indicators were identified: Resident Survey (A), Systematic Observations (B), Key Informant Interviews (C) and Archival Data (D). These were assigned to the previously identified indicators. The Resident Survey and Archival Data are quantitative methods of data collection that record variations in social life in terms of predetermined categories: 1. data are numbers or attributes that can be ordered in terms of quantity or magnitude, 2. most often used as evidence to support claims, statements and hypotheses.

Systematic Observations and Key Informant Interviews are qualitative methods of data collection designed to capture social life as participants experience it rather than in categories predetermined by the research: 1. data are mostly written or spoken words or observation, 2. data do not have a direct numerical interpretation, and 3. exploration is most often the motive for using qualitative methods.

The use of triangulation as a method for study for research questions intends to give measurement validity and authenticity to the research.

TBL Goal	Indicators		Measuring Tools			
			A	B	C	D
Social Equity	Health and Safety	Physical Activity	x	x		
		Crime & Perception of Safety	x		x	x
		Availability of Healthy Food	x	x		x
	Community Building	Neighborhood Pride & Satisfaction	x			
		Beautification /Aesthetics	x	x		
		Civic Engagement	x	x	x	x
		Outside Partnerships			x	

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	Education	Local Leader Development	x		x	
		Local History Awareness, Education & Appreciation			x	
		Skill Development			x	
		Participation in Educational Activities	x		x	x
Environmental Health	Eco-Appreciation	Eco-Literacy	x			
		Connection between Person & Environment	x			
		Intentional Open/Park Space		x		
	Environmental Improvement	Toxin Removal			x	x
		Litter Reduction	x	x		
		Waste Reduction	x	x		
		Use of Alternative Energy		x	x	x
	Eco-System Management	Local Biodiversity		x	x	
		Use of Local Materials		x	x	
		Greenhouse Gas Mitigation	x		x	x
Stormwater Management			x	x		
Economic Prosperity	Cost-Benefit Analyses of New Projects	Startup Costs			x	
		Costs of Leaving Land Vacant			x	
		Local Tax Revenue				x
		Operation Costs			x	
		Direct Income			x	
	Neighborhood Capital	Reinvestment/ Redevelopment		x	x	x
		Job Creation			x	

Table 6. Measuring Tools for Indicators.

(A) Resident Survey. (B) Systematic Observation. (C) Key Informant Interviews. (D) Archival Data.

Resident Survey

Surveys are the most common and versatile operation for data collection to quantitatively measure social variables. In formulating the Resident Survey, existing surveys that examined similar indicators were used as a framework. Original questions were then modified, in order to obtain specific measurable data required for this new research. Question sets were used to reduce idiosyncratic variation. The extent of the mailing area for this survey was determined as a quarter-mile radius from eco-urbanism strategies. At the present time, the Resident Survey has been finalized and mailing will occur by the end of March.

TBL Goal	Indicators		Surveys
Social Equity	Health and Safety	Physical Activity	International Physical Activity Questionnaire ³⁴
		Crime & Perception of Safety	Criminal Victimization & Perceptions of Community Safety in 12 Cities, 1998 ³⁵ Neighborhood Satisfaction Survey ³⁶
		Availability of Healthy	Measuring availability of healthy

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		Food	foods: Agreement between directly measured and self-reported data ³⁷
	Community Building	Neighborhood Pride & Satisfaction	Minority Youth Health Community Mobilization Survey ³⁸ Neighborhood Satisfaction Survey ³⁹
		Beautification / Aesthetics	Neighborhood Satisfaction Survey ⁴⁰ Littering Behavior in America ⁴¹
		Civic Engagement	Neighborhood Cohesion Instrument ⁴² Minority Youth Health Community Mobilization Survey ⁴³
		Local Leader Development	Minority Youth Health Community Mobilization Survey ⁴⁴
Environmental Health	Eco-Appreciation	Eco-Literacy	Values and Proenvironmental Behavior: A Five-Country Survey ⁴⁵
		Connection between Person & Environment	Connectedness to Nature Scale (Mayer & Frantz, 2004) Nature Relatedness Scale ⁴⁶
	Environmental Improvement	Litter Reduction	Littering Behavior in America ⁴⁷ Values and Proenvironmental Behavior: A Five-Country Survey ⁴⁸
		Waste Reduction	Values and Proenvironmental Behavior: A Five-Country Survey ⁴⁹
	Eco-System Management	Greenhouse Gas Mitigation	Values and Proenvironmental Behavior: A Five-Country Survey ⁵⁰

Table 7. Relevant Surveys for Indicators.

Systematic Observations

The observation of natural social processes is a method for gathering data in the field in a fixed manner, in order to make a record of the presence of certain activities, subjects, or objects in either the site strategy, or in its close vicinity. It is generally used to supplement interviews and survey data. In addition, this method aims to obtain both quantitative (counting the amount of subjects present) and spatial data (recording the location of the subject at the time of observation). The extent of the Systematic Observations for this project was determined as a quarter-mile radius from eco-urbanism strategies. Specific methods of implementing Systematic Observations were determined for different indicators.

TBL Goal	Indicators		Observation of Activities, Subjects or Objects
Social Equity	Health and Safety	Physical Activity	Presence of people conducting physical activities, trails & greenways
		Availability of Healthy Food	Presence of vegetable gardens and grocery stores
	Community Building	Beautification /Aesthetics	Presence of street trees and urban furniture
		Civic Engagement	Presence of participating residents in community

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			centers/places of worship that act as community centers & volunteers in community project
Environmental Health	Eco-Appreciation	Intentional Open/Park Space	Presence of people utilizing public open space
	Environmental Improvement	Litter Reduction	Presence of litter
		Waste Reduction	Presence of recycling bins
		Use of Alternative Energy	Presence of solar cells, wind turbines etc.
	Eco-System Management	Local Biodiversity	Presence of local flora y fauna
		Use of Local Materials	Presence of local materials used in community projects
		Stormwater Management	Presence of bioswales, detention or retention ponds, rain gardens, rainwater barrels or other stormwater management structures
	Neighborhood Capital	Reinvestment/ Redevelopment	Presence of new or recent redevelopment

Table 8. Systematic Observation of Activities, Subjects or Objects.

Key Informant Interviews

To measure many of these indicators, it is necessary to have knowledge of the area or situation under study. Key Informants Interviews aim to gather qualitative data from representatives of various groups affected who represent a range of perspectives. The interview schedule includes open-ended questions outlined but is flexible in the order in which they are asked, and in allowing additional questions to be asked as deemed relevant. Possible key informants were identified for the evaluation of different indicators.

TBL Goal	Indicators		Key Informants
Social Equity	Health and Safety	Crime & Perception of Safety	Neighborhood Stabilization Officer
	Community Building	Civic Engagement	LLC Teams / Project Leaders / Neighborhood Figures
		Outside Partnerships	LLC Teams / Project Leaders / Partners
		Local Leader Development	LLC Teams / Project Leaders / Regular Participants
	Education	Local History Awareness, Education & Appreciation	LLC Teams / Project Leaders / Neighborhood Figures
		Skill Development	LLC Teams / Project Leaders / Regular Participants
		Participation in Educational Activities	LLC Teams / Project Leaders / Neighborhood Figures
Environmental	Environmental	Toxin Removal	LLC Teams / Project Leaders

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Health	Improvement	Use of Alternative Energy	LLC Teams / Project Leaders
	Eco-System Management	Local Biodiversity	LLC Teams / Project Leaders
		Use of Local Materials	LLC Teams / Project Leaders
		Greenhouse Gas Mitigation	LLC Teams / Project Leaders
		Rainwater Management	LLC Teams / Project Leaders
Economic Prosperity	Cost-Benefit Analyses of New Projects	Startup Costs	LLC Teams / Project Leaders
		Costs of Leaving Land Vacant	St. Louis City Government
		Operation Costs	LLC Teams / Project Leaders
		Direct Income	LLC Teams / Project Leaders
	Neighborhood Capital	Reinvestment/ Redevelopment	LLC Teams / Project Leaders / Neighborhood Figures
		Job Creation	LLC Teams / Project Leaders

Table 9. Key Informants.

Archival Data

Archival data refers to the source of quantitative evidence gathered from existing records or documents to answer the intended research question. The consulted and analyzed material will aid in establishing comparisons, verifying or challenging existing findings, or drawing evidence from disparate sources, among others. Specific archival data sources were identified for the evaluation of different indicators.

TBL Goal	Indicators		Data Sources
Social Equity	Healthy and Safety	Crime & Perception of Safety	St. Louis Neighborhood Crime Data
		Availability of Healthy Food	USDA Food Access Research Atlas GIS Data (Presence of Vegetable Gardens and Grocery Stores)
	Community Building	Civic Engagement	LLC Team Records
	Education	Participation in Educational Activities	LLC Team Records
Environmental Health	Environmental Improvement	Toxin Removal	LLC Team Soil Test Results
		Use of Alternative Energy	LLC Team Records GIS Data (Presence of Solar Cells, Wind Turbines etc.)
	Eco-System Management	Greenhouse Gas Mitigation	GIS Data (Presence of new trees and alternative fuel stations)
		Rainwater Management	GIS Data (Presence of bioswales, bioretention ponds, rain gardens, rainwater barrels or other rainwater management structures)
Economic Prosperity	Cost-Benefit Analyses of New Projects	Local Tax Revenue	Tax Records

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	Neighborhood Capital	Reinvestment/ Redevelopment	Building Permits GIS Data (Presence of new or recent redevelopment)
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Table 10. Archival Data Sources.

DISCUSSION

"The neighborhood is a social and geographic concept that plays an increasingly important role in research."⁵¹ Lynch calls the neighborhood "the basic building block of the city,"⁵² as each neighborhood represents a unique set of conditions that gives rise to "one context for community life."⁵³ Shifting up to the larger scale of the city means a loss of this specificity, as well as a decrease in reliability and measurement validity. Conversely, a shift down to the smaller scale of the individual project, results in a loss of consideration of potential synergetic relationships within projects. ONSL, as the site of the SLLC, requires the specificity of the neighborhood scale. Given the high number of eco-urbanism strategies in the region, studying synergies at this scale also becomes extremely significant.

Most of the current projects in ONSL are small interventions sited within single lots, which require lots of manpower to operate. This is probably a result of them being implemented by small neighborhood groups with fewer resources than large organizations. While residents are certainly not below par in terms of their capability, the sheer number of vacant lots simply overwhelms the total capacity of the 1916⁵⁴ residents. We hypothesize that future strategies will need to avoid relying on the community manpower.

The STLSP and STAR overlap heavily in their functional categories and goals, and also adhere well to TBL sustainability goals. However, the STAR as a rating system evaluates the city only at a point in time or over a short period. A one-time evaluation through STAR will not reflect changes that require maturation, or long-term trends. Recertification is hence important to maintain the score's validity and reliability.

Although present research covers the development of a methodology yet to be implemented, one of the goals of the larger study is to build a flexible framework that can adapt to other neighborhoods within St. Louis, as well as other shrinking cities. Therefore, the current methodology must be tested in neighborhoods with different conditions from ONSL. Future research plans include assessing neighborhoods selected from the SNSGC and a control neighborhood (no eco-urbanism strategies), and in doing so, introduce modifications that will make this methodology more universal.

In addition, future research plans discuss evaluating the differences between a top-down and a bottom-up approach in the implementation of eco-urbanism strategies. Our studies in ONSL involve examining the top-down approach, characterized by: 1. the neighborhood organization (ONSLRG) serving as the main community contact, 2. the lack of community involvement due to a specific directive from the competition organizers. The new neighborhoods studied (SNSGC finalists) will exhibit a bottom-up approach, characterized by: the community itself proposing, implementing and operating these projects.

This new research question requires consideration of the implemented strategies' longevity, scalability and replicability. Our current methodology needs to be modified to assess these new indicators. We

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hypothesize that SNSGC's impact on the longevity of strategies will be greater due to the community involvement, while the SLLC strategies' future after the two-year lease remains uncertain.

Problems may also develop with regards to the Resident Survey: 1. as the SLLC did not promote community involvement and ownership in the projects, return rate will be low, 2. informal feedback highlighted survey exhaustion as a problem in ONSL, 3. the economic crisis has nationally affected property values, and might lessen perceptions of an increase due to beautification efforts, 4. community awareness may be low as educational components of most projects are currently not present, 5. the projects' effects may go beyond their two-year lifespan.

It is also expected that future research will use the results of this assessment to compare efficiency between isolated strategies (e.g. a vegetable garden owned and maintained by a single resident) and strategies linked in synergetic networks (e.g. HUB of the SLLC). It is hypothesized that much of the success of eco-urbanism strategies in St. Louis is curtailed by the dearth of synergetic relationships between existing strategies. We hypothesize that the top-down approach will foster more synergies due to the use of a neighborhood strategic plan.

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