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BROWNFIELD REDEVELOPMENTS IN BIRMINGHAM, ALABAMA: AN
EVALUATION OF THE ROLE OF CITIZEN PARTICIPATION UTILIZING THE
FRAMEWORK OF ARNSTEIN'S LADDER

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A DISSERTATION

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BROWNFIELD REDEVELOPMENTS IN BIRMINGHAM, ALABAMA: AN EVALUATION OF THE ROLE OF CITIZEN PARTICIPATION UTILIZING THE FRAMEWORK OF ARNSTEIN'S LADDER

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ABSTRACT

The primary research objective is investigating the extent of citizen participation decision-making in the brownfield redevelopments in Birmingham, Alabama's downtown revitalization to develop best practices for brownfield redevelopment collaboration. The technical literature affirms the need for citizen participation in project decision-making processes. Limited literature exists on how to best evaluate and incorporate participatory activities in brownfield redevelopments. This research adds to the literature, filling this gap by utilizing Arnstein's ladder as an evaluative framework to quantify public participation in practice. It is important to understand how the extent of public participation in project decision-making may promote or hinder brownfield redevelopment.

Using case study mixed methods methodology, participatory activities were evaluated of brownfield redevelopments located in Birmingham, Alabama. Based on defined criteria, three brownfield projects were selected for the research study. These cases were assessed using semi-structured interviews and surveys, and utilizing Arnstein's ladder of participation as an evaluative framework of stakeholders' perspectives and targeted participatory indicators of the brownfield redevelopment. Primary data were analyzed from semi-structured interviews and surveys collected from stakeholders that were involved in the redevelopments. Stakeholders consisted of citizens, public officials, and developers.

Secondary data sources included review of literature, historical meeting records, newspaper articles, and the internet.

In the research findings, directly addressing the needs of the public/citizens, listening to the community, and actively engaging citizen stakeholders in their environment were likely linked to meaningful brownfield redevelopment participation. Survey results strongly suggest that perceived meaningful decision-making amongst stakeholders vary and a commitment of listening to what the 'community' needs may lead to positive redevelopment outcomes. The perceptions of empowerment were significantly different between stakeholder categories. Citizen and public official stakeholders' perceptions were found to be $p=0.04$, whereas, perceptions amongst citizens and developers ($p=0.12$) and public officials and developers ($p=\sim1.0$) were not significant. These results indicate that implementation of meaningful citizen decision-making processes should be clearly understood and committed to for participatory synergy amongst stakeholders.

Research results of public/citizen involvement in brownfield redevelopments in Birmingham, Alabama could assist with developing brownfield best practices and aid in policy development.

Keywords: Brownfield, Redevelopment, Arnstein's Ladder, Citizen Participation, Public Participation

DEDICATION

Major milestones are rarely accomplished alone and the culmination of my Ph.D. dissertation would not have been possible without the unwavering encouragement, inspiration, and support of my family, friends, and colleagues. I also dedicate this document in loving memory of my father, mother, sister, and grandma Lucine who endearingly called me "Sondria," as I fulfilled the promise that I made to you.

It is the spirit of my parents, sisters Sonia and Diane, grandma Lucine, auntie Valerie, nephew Jeremy, cousins, friends, and colleagues that helped me get to this point. To all of you, my deepest love and appreciation because I would not have made it this far without YOU!!! I truly thank you for your support throughout my lifelong learning journey.

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LIST OF ABBREVIATIONS

ACRES: Assessment, Cleanup, & Redevelopment Exchange System Database

ADEM: Alabama Department of Environmental Management

APA: American Planning Association

BCP: City of Birmingham Comprehensive Plan

BF: Brownfield

BF AWP: Brownfield Area-Wide Planning Program

BUILD: Brownfield, Utilization, Investment and Local Development Act

CERCLA: Comprehensive Environmental Response, Compensation, and Liability Act

CP: Citizen Participation

CUED: The National Council for Urban Economic Development

DDT: Dichlorodiphenyltrichloroethane

EJ: Environmental Justice

IAP2: International Association for Public Participation

IBM: U.S. The International Business Machines Corporation

OZ: Opportunity Zone

RPCGB: Regional Planning Commission of Greater Birmingham

SPSS: Statistical Product and Service Solutions (formerly, Statistical Package for the Social Sciences)

USCM: United States Conference of Mayors

U.S. EPA: United States Environmental Protection Agency

VCP: Voluntary Cleanup Program

CHAPTER 1

INTRODUCTION

Background

Deindustrialization, unregulated industry, and suburban sprawl have resulted in abandoned commercial and industrial property which is the premise of how 'brownfields' were created. A brownfield (BF) is previously developed land that is polluted or suspected polluted and is not currently in use (Bartsch, 2003; Paull, 2008). The U.S. Environmental Protection Agency (U.S. EPA) defines a brownfield as "real property, the expansion, reuse, or redevelopment, of which may be complicated by the presence or potential presence of a contaminant, pollutant, or hazardous substance," of which, more than one million brownfields are estimated to exist in the United States (Davis and Sherman, 2010; U.S. EPA, 2017a). To combat the brownfield problem, the U.S. EPA and other agencies have implemented brownfield policies to promote public engagement in the cleanup and redevelopment of these properties (U.S. EPA, 2017a; Alabama Department of Environmental Management (ADEM), 2018; Favors, 2018; Nolan, 2018).

This focused attention on brownfields has created substantial research in areas such as stakeholder participation/involvement, environmental risk assessment, redevelopment factors, remediation technologies, health assessment, economic feasibility, smart growth policy, and evaluative index system (De Sousa, 2003; Solitare, 2005; Brebbia and Mander, 2006; Dixon *et al.*, 2011; U.S. EPA, 2017a; ADEM, 2018;

Green, 2018). A review of the literature not only revealed that brownfields negatively impacted the environment and human health, but redeveloped brownfields were linked to restoring human health and the environment to productive reuse, adding to the local tax base and generating jobs (U.S. EPA, 2017a; ADEM, 2018). For example, the United States Conference of Mayors (USCM) produced a series of articles entitled 'Recycling America's Land: A National Report on Brownfields Redevelopment' which highlighted brownfield redevelopment benefits (self-reported but not verified) such as the generation of $233 million dollars in local tax revenue and the creation of 83,171 jobs (USCM, 2006). More than 200 cities across the U.S. provided this data to USCM (2006).

Brownfield data mining has been obtainable because redevelopment and cleanup practices have evolved since the 1990s and are well-established (U.S. EPA, 2015, 2017a, 2019). However, literature indicates the need to effectively integrate and how best to evaluate brownfield redevelopment participatory activities (Lange 2001; De Sousa, 2003; Solitare, 2005; Gallagher and Jackson, 2008; Simon, 2013; Contreras, 2019). An understanding of these processes is paramount for meaningful public participation (Lange 2001; De Sousa, 2003; Solitare, 2005; Gallagher and Jackson, 2008; Contreras, 2019). For the EPA, stakeholder participation is one of the major tenets of the Brownfield Acts (U.S. EPA, 2002). This research attempts to address the gap of how to incorporate meaningful public participation and best evaluate participatory activities in brownfield redevelopment projects.

This study advances research on brownfield redevelopment participatory practices by exploring how well the findings in the technical literature regarding citizen engagement corresponds to actual practice, assessing participatory perspectives of

different stakeholders that were involved in the redevelopments, evaluating stakeholders'

outcome of project success, and analyzing if public participation decision-making efforts

may have had an impact on the outcome of the brownfield redevelopment. To quantify

these tasks, Arnstein's (1969) ladder was utilized as an evaluative framework to assess

public participation in practice as it is important to understand how public participation in

project decision-making may promote or hinder brownfield redevelopment.

This research uses case study mixed methods methodology to evaluate

participatory activities of brownfield redevelopments located in the city of Birmingham,

Alabama. Based on defined criteria, three brownfield projects were selected to serve as

the context for the research study. These cases were assessed utilizing Arnstein's ladder

of participation as a framework and evaluate stakeholders' perspectives and targeted

participatory indicators of the brownfield redevelopment. Primary data were analyzed

from semi-structured interviews and surveys collected from stakeholders that were

involved in the redevelopments. Secondary data sources were also assessed which

included review of the technical literature, historical meeting records, newspaper articles,

and the internet.

Research results implementing citizen participation (CP) from brownfield

redevelopments in Birmingham, Alabama could assist in developing the foundation for

brownfield redevelopment best practices and aid in policy development in the U.S. and

could be applicable worldwide.

Evolution of Environmental Legislation and Participation

The ills that anthropogenic activities have had on the environment is not new and

has created a host of problems. Brownfields are one such environmental problem that is

present in almost every major city in the United States (USMC, 1998, 1999, 2000, 2006).

However, cleanup and redevelopment of these sites requires an effective collaborative

effort by all stakeholders (De Sousa, 2003; Lange and McNeil, 2004; Solitare, 2005).

This calls for public involvement and the accountability of environmental degradation

activities which came to light in the 1960s.

In 1962, Rachel Carson, known as the founder of the modern environmental

movement, quoted "the most alarming of all man's assaults upon the environment is the

contamination of the earth, river, air and sea with dangerous and even lethal materials,"

(Carson, 1962). She called for humans to act as stewards of the environment. This was

one of the first documented efforts to elicit public participation in environmental issue. In

Carson's book, 'Silent Spring,' she researched more than six years of humans misusing

persistent, powerful chemical pesticides before understanding the full potential of harm to

the entire biota (Carson, 1962). Carson vehemently made the public and officials aware

that pesticides such as dichlorodiphenyltrichloroethane (DDT) were devastating to the

environment and to wildlife. Not only did her research document that DDT was being

ingested by large birds such as condors and eagles, but she had documented proof that

DDT traveled through the food chain to humans and was detected in mother's milk

(Carson, 1962). Her research showed that pesticides in drinking water and food could

interact with each other and cause cancer in humans. In 1972, research findings in

Carson's book, 'Silent Spring,' led the federal government to ban the use of DDT in the

United States. This event was credited with the launch of the environmental movement.

Since Carson sounded the alarm on environmental and wildlife devastation by the

misuse of chemicals, the occurrence of two major disasters – the Cuyahoga River fire and

the Love Canal, were also influential in spurring environmental legislation. The Cuyahoga River incident occurred because hazardous chemicals were dumped into the Cuyahoga River which drains into Ohio's Lake Erie and the river that flowed onto Lake Erie caught on fire. The Love Canal environmental disaster resulted from the city of Niagara Falls building a residential complex over a capped hazardous waste landfill. This incident was the first time emergency funds were declared for an environmental disaster. Today, the residents of the Love Canal are still experiencing medical illness from the hazardous landfill. Environmentalists speculate that families will continue to feel the effects of this environmental disaster for decades (Herbeck, 2018).

The occurrence of these environmental incidences, prompted environmental policies that promote public involvement, property cleanup and redevelopment (U.S. EPA, 2002). These policies, i.e., Resource Conservation and Recovery Act, Comprehensive Environmental Response, Compensation, and Liability Act, Brownfields Programs, etc., are mainly focused on regulating the chemical and petroleum industries' use and management of hazardous materials from cradle to grave. Environmental policies were also implemented that focused on Voluntary Cleanup (VCP) of contaminated or perceived contaminated sites. The overall goal of environmental policies is to hold culprits accountable for degrading the environment while agencies and citizens are instrumental in the cleanup and revitalization of these properties (U.S. EPA, 1976, 2002, 2017b, 2018).

The U.S. Congress passed environmental legislation, which were administered through the U.S. EPA (2002), that launched numerous policies and programs such as the Brownfields Act, to work with local and state municipalities to cleanup and redevelop

brownfields. Results of brownfield policies have returned properties to productive reuses, however, there still exist the lack of robust public participation which has often been associated with some of the barriers to redevelop these sites (Lange and McNeil, 2004; Solitare, 2005; Paull, 2008). To that end, meaningful participation in brownfield redevelopments can also be defined as a process where public participation educates citizens, communicates with them, and incorporates their ideas and comments which can often enhance the quality of project outcome (Rowe and Frewer, 2005).

Furthermore, the definition of participation can vary based on the context which it is understood, the decision-making process and when used (Steelman and Ascher, 1997; Davidson, 1998; Buchy and Hoverman, 2000; Luyet, 2005; Mostert *et al.*, 2007; Reed, 2008; International Association for Public Participation (IAP2), 2018). For instance, the World Bank (1996) defines participation by stakeholders as 'a process for which shared development decision-making, initiatives, and resources are influenced, shared and controlled by the impacted individuals.' Stakeholders may include the public, community organizations, public officials, developers and investors all whom can impact project outcome (Berens, 2011). This work will use the term public participation, community participation, and citizen participation interchangeably which describes the affected stakeholder group.

The U.S. EPA and other agencies have implemented brownfield policies to involve the public and other stakeholders in cleanup and redevelopment processes (U.S. EPA, 2017b; ADEM, 2018; Favors, 2018; Nolan, 2018). While federal, state, and local regulations call for public participation in the decision-making processes, research has indicated that meaningful participation in brownfield redevelopment typically occur at

lower levels of participation, i.e., less than strong participation (Lange, 2001; Solitare, 2005).

Although meaningful participation in most development projects are not at an ideal level, interest has increased in environmental decision-making participatory efforts (Abelson *et al*., 2007; Hansen and Maenpaa, 2007; Reed, 2008). For instance, citizen participation is a critical element of grant proposals sponsored by the U.S. EPA's environmental legislation and has been part of a wide range of environmental applications including planning (Buchy and Hoverman, 2000; Buchecker *et al*., 2003), environmental governance (Rist *et al*., 2007), ecosystem management (Knight *et al*., 2006), integrated watershed management (Kenney *et al*., 2000; Sabatier *et al*., 2005), agricultural development (Chambers, 1994; Wilson, 2004), and forest management (Buttoud and Yunusova, 2002; Carter and Gronow, 2005).

Furthermore, participatory activities can be perceived as an element that could enhance the quality of a developments' outcome. The process of citizen participation can provide a wide range of advantages as well as disadvantages. Table 1 illustrates some of the pros and cons of stakeholder participation. Table 1 also indicates how there can be as many possible disadvantages for implementing participatory activities as well as advantages.

Table 1: Public Participation: Pros and Cons (Luyet *et al.*, 2012)

Pros of Participation
- Assortment of expertise and resources (Kenney *et al*., 2000; Leach *et al*., 2001; Kemp-Rotan, 2019)
- Local knowledge can improve project design (Beierle and Cayford, 2002; Habron, 2003; Irvin and Stansbury, 2004)
- Build trust with decision-making and public's acceptance of decisions (Beierle, 1999; Beierle and Konisky, 2000; Richards *et al*., 2004; Junker *et al*., 2007; Reed, 2008)
- Enhance knowledge of projects' issues (Duram and Brown, 1999)
- Integration of all stakeholders' opinions and interests (Creighton, 1986; Duram and Brown, 1999; Griffin, 1999; Korfmacher, 2001)
- Develop and foster social learning (Beierle and Cayford, 2002; Pahl-Wostl, 2002; Blackstock *et al*., 2007; Junker *et al*., 2007)
- Maximize implementation of projects and plans (Konisky and Beierle, 2001; Irvin and Stansbury, 2004)

Cons of Participation
- Process could be time consuming and expensive (Vroom, 2000; Korfmacher, 2001; Lawrence and Deangen, 2001; Mostert, 2003; Luyet, 2005)
- More power to already powerful stakeholders (Buttoud and Yunusova, 2002)
- New issues evolve (Cooke and Kothari, 2001; Germain *et al*., 2001; Kangas and Store, 2003)
- Create possible stakeholder frustration (Germain *et al*., 2001; Irvin and Stansbury, 2004; Reed, 2008)
- Stakeholders unattached to the issues become involved (Korfmacher, 2001; Junker *et al*. 2007; Reed, 2008)

The incorporation of citizen decision-making in redevelopment projects attempts to create a transparent, fair, and equitable process that encourages respect among stakeholders, learning, trust, and equity (Moote *et al*., 1997; Webler *et al*., 2001; Reed, 2008). As such, redevelopment projects should also include early stakeholder involvement, scientific and local knowledge integration, and establish guidelines in advance (Renn *et al*., 1995; Leach *et al*., 2001; Leach *et al*., 2002; Bartsch, 2003; Sabatier *et al*., 2005; Tippett *et al*., 2007; Reed, 2008). Participatory activities have been shown to be beneficial for projects, however, utilizing the best examples of public participation does not guarantee project success (Solitare, 2005). Other conditions such as historical, cultural, and political context must be taken into account when engaged in community redevelopment (Sobel *et al*., 2001; De Sousa 2003; Vroom, 2003; Irvin and Stansbury, 2004; Lange and McNeil, 2004; Sabatier *et al*., 2005; Solitare, 2005; Abelson *et al*., 2007; Stenseke, 2009). A few context features of brownfield redevelopment are addressed in subsequent sections.

Although there are many forms for meaningful public participation, it is often reduced to holding workshops and disseminating information (Chess and Purcell, 1999; Rowe *et al*., 2004). The following section will discuss types of participation or what is often phrased as 'degrees' of public participation.

Techniques/Degrees of Participation

As implied by the definition 'meaningful participation' is often linked to strong collaborative efforts among stakeholders where citizens have an opportunity to impact the project outcome (Arnstein, 1969). This form of participation involves understanding

each stakeholders' abilities and goals (Arnstein, 1969; Solitare, 2005; Berens, 2011; Contreras, 2019; Schoonover *et al*., 2019*)*. This type of participation and understanding it is what Sherry Arnstein (1969) define as 'power' and is the foundation of her framework for the ladder of participation. Arnstein's typology of participation is credited with being the first work to define the degrees of public participation and power. Her degrees of participation consist of three main categories with eight levels or what is often referred to as steps or rungs of a ladder (Arnstein, 1969). The three main categories with their corresponding levels of public participation are listed as follows. Details of these levels are described in the literature review section.

- Nonparticipation: manipulation and therapy,
- Tokenism: informing, consultation, and placation, and
- Citizen Power: partnership, delegation, and citizen control (Arnstein, 1969).

At the bottom levels, the ladder describes non-participation of citizens and these participatory activities aim to only educate the public. The steps of the ladder are manipulation and therapy which are processes designed not to enable public participation but enable power holders to educate. The second category of Arnstein's ladder is tokenism which does provide citizens with the opportunity to be heard. However, action by the power holders is not insured. This category consists of three rungs: informing, consultation and placation. At the top levels of Arnstein's ladder is where citizen power is exercised. This category consists of three levels: delegated power, partnership, and citizen control. These levels allow for key citizen decision-making power. Although this ladder is a simplification of public participatory activities, it serves to illustrate that there are significant rankings of citizen participation (Arnstein, 1969).

Since the initial introduction of Arnstein's ladder of participation, several revisions and adaptations have been made to her work (Weidermann and Femers, 1993; Davidson, 1998; Vroom, 2003; Lawrence, 2006; Contreras, 2019). For instance, Contreras (2019) modified and adapted Arnstein's model to his research on community participation in organizational post-disaster cleanup and recovery work in Haiti. Contreras' work highlights the practicality and statistical significance of using Arnstein's (1969) ladder of participation as a framework to address the question of participation. Contreras' work also suggests the use of Arnstein's (1969) framework for guiding different applications of participation. His research utilized Arnstein's ladder as a quantitative model to analyze primary data that measured how well and effective organizations incorporated citizens in environmental project work. Contreras' methodology consisted of revising Arnstein's (1969) framework to five degrees of participation for the application of organizational post-disaster project community participation activities. Contreras' five degrees of participation are discussed in the 'Evaluation of Study Framework' section.

The statistical significance of Contreras' research suggest that citizens are empowered and Arnstein's ladder adequately supports the assessment of community roles. Nonetheless, these participatory activities are often overlooked because broad evaluations are usually performed (Contreras, 2019). Research findings of Contreras' Likert five-point scale, five being optimal citizen engagement and empowerment, indicated that Arnstein's participation indicator had an above average level of participation of 3.42. Validity and reliability statistical technique measures also supported the models' results and its applicability for other project measures of public participation.

This model is the framework utilized to assess public participation among successfully completed brownfield redevelopments in Birmingham, Alabama.

In addition to, as well as based on the type of project, participatory activities can include a variety of techniques. Some common techniques that typically or often dictate the degree of public involvement are illustrated in Table 2. The degree of involvement is a critical aspect of stakeholder participation because it influences all the processes, in particular, it could impact the outcome of a brownfield redevelopment.

Table 2: Degrees of Participation: Participatory Techniques
Sources: Rowe and Frewer, 2000; Richards *et al*., 2004; Tippett *et al*. 2007; IAP2, 2018.

Techniques	Information	Consultation	Collaboration	Co-decision	Empowerment
Citizen jury		X	X	X	X
Cognitive map	X	X	X		
Consensus conference		X	X	X	X
Field visit & interactions	X	X	X		
Focus group				X	X	X
Geospatial/ decision sys	X	X	X	X	
Internet webpage	X	X			
Interviews & surveys	X	X	X		
Multi-criteria Analysis			X	X	
Newsletter	X				
Participatory mapping	X	X	X		
Presentations, public hearings	X	X	X		
Reports	X				
Role playing	X	X	X		
Scenario analysis		X	X	X	X
Workshop		X	X	X	X

Problem Statement

Brownfield redevelopment involves a multidisciplinary, collaborative process affecting the interests of a variety of stakeholders, including but certainly not limited to the public, public officials, community organizations, investors, developers, and residents in the vicinity (i.e., affected citizens) of the brownfield (Berens, 2011). Furthermore, literature highlights the need for participation among affected residents and other stakeholders in the development process (Solitare, 2005). However, there is limited research on ways to implement participation, analyze, and measure public participation and policies within brownfield and environmental redevelopment projects (Solitare, 2005; Contreras, 2019). This research activity addresses these gaps which explores how best to evaluate participation and offer ways of incorporating meaningful stakeholder participatory activities in brownfield redevelopments.

Research Objectives and Questions

To address the incorporation of meaningful participatory elements in brownfield research, this investigation applies mixed methods methodology with the use of qualitative case study and quantitative survey responses to explore the role of citizen participation processes in brownfield redevelopment decision-making. The research assesses three local case studies by employing stakeholder interviews and surveys, historical meeting records, newspaper articles, technical literature, and the internet. Arnstein's ladder of participation was utilized as an evaluative framework to quantify participatory data from Birmingham, Alabama's brownfield redevelopments.

The following tasks guided the research. First, the research documents which stakeholders are participating in the decision-making process and their measure of participation. Secondly, the research investigates stakeholders' perceptions of participatory decision-making activities. Thirdly, the extent participatory elements may have had influencing redevelopment outcomes were evaluated. Lastly, the perceptions of empowerment in the participatory process between stakeholders were compared. That said, the primary research questions are as follows.

- How well do participation techniques facilitate public participation in brownfield redevelopment?

- Utilizing Arnstein's Ladder, are there significant differences in the perceptions of empowerment in the participatory process between stakeholders?

The primary purpose of the case study is to conduct a thorough review of public participation in brownfield redevelopment decision-making. To that end, this research evaluates Birmingham, Alabama's local brownfield redevelopments to determine if the redevelopment projects are aligned with the principles of meaningful public participation. This research surmises that meaningful participation occurs when the decision-making process is understood to be successful when communication between stakeholders is maximized, typically occurring at Arnstein's upper levels, and a mutual outcome is produced, i.e., the production of a successful brownfield redevelopment. For the purpose of this research, the term 'brownfield redevelopment success' is defined as being that the stakeholders are satisfied with the outcome of the brownfield redevelopment. Therefore, the research investigates the participatory decision-making process, specifically, whether

or not meaningful participation occurred or stakeholders felt empowered during the participatory redevelopment process.

The research explores whether or not the stakeholders have different perspectives of the decision-making process for the redevelopments. Analysis was performed to determine stakeholders' perspectives of what they consider as meaningful redevelopment participation which often enhances project outcome (Rowe and Frewer, 2005). To operationalize these tasks, Arnstein's ladder of participation was employed as an evaluative framework. Ultimately, the aim of this research is to investigate the role citizen participation decision-making in Birmingham, Alabama's brownfield redevelopments.

Evolution of Study Framework

A central purpose of this research is to investigate how well the findings in the literature review concerning citizen engagement in brownfield redevelopments corresponds to actual practice. Researchers have recommended that meaningful citizen participation be incorporated into planning processes involving environmental projects such as brownfield redevelopment, storm water systems implementation, and environmental cleanup/recovery (Beierle, 1999; Marsalek and Chocat, 2002; U.S. EPA, 2002; Parkinson, 2003; Priscoli, 2004; Rauch *et al.*, 2005; Lange, 2001; Solitare, 2005; Contreras, 2019).

For instance, decision-making on environmental issues is a very important part of public participation as indicated by Beierle's (1999) study which suggest that differing perspectives among various stakeholders complement the environmental projects' process. Many case studies that document successful brownfield redevelop-

ments, their public benefit, and participatory components, have been well-documented and compiled by the U.S. EPA (2017a).

The Atlantic Station project is one such brownfield redevelopment that employed many participatory elements. Atlantic Station, a 138-acre former steel facility site in Atlanta, Georgia, is a successful brownfield redevelopment that involved partnerships with multiple levels of stakeholders (U.S. EPA, 1999; De Sousa and D'Souza, 2013). Residents, citizen groups, and other affected citizens were very instrumental in decision-making at all phases of the redevelopment because the projects' surrounding area was comprised of three major residential neighborhoods (De Sousa and D'Souza, 2013). This large voice of stakeholders required a number of developers and local, city, and federal officials to often make key revisions to the development (De Sousa and D'Souza, 2013). Suspected but not verified, the substantial amount of meaningful public participation is why to date, the two-billion-dollar smart growth project is one of the largest successful brownfield redevelopments shepherded by the U.S. EPA (U.S. EPA 1999; Nolan, 2018). The development not only consists of many smart growth aspects such as walkability and reduction in emissions, it also features work-live facilities, multiple housing options, retail, and entertainment (De Sousa and D'Souza, 2013). It was these project aspects that contributed to Atlantic Station receiving the honor of being one of nation's best brownfield redevelopments in 2004 and the U. S. EPA's Phoenix Award (De Sousa and D'Souza, 2013).

As investments in brownfield redevelopment progresses, it is important to understand how the extent of public participation in project decision-making may

promote or hinder brownfield redevelopment. Public participation is often termed as a

nontechnical process and could hinder or complement planning processes (Beierle &

Cayford, 2002; Priscoli, 2004). This study assesses participatory activities of three

brownfield redevelopments in Birmingham, Alabama utilizing the framework of

Arnstein's (1969) ladder as an evaluative structure. The adaptation of the context of

Arnstein's ladder to a five rung model is outlined as follows and is the base for

assessing participatory elements in the brownfield redevelopment project areas (Bartsch,

2003; Callahan, 2007; Cornwall, 2008; U.S. EPA, 2015; Kemp-Rotan, 2019;

Schoonover *et al*., 2019).

Adaptation of Arnstein's Ladder Framework for Case Study

According to Contreras' (2019) study, Arnstein's ladder provides a systematic

approach to measure citizen participation decision-making in development projects.

Contreras (2019) indicated that an advantage of this framework is its simplistic

application ability and could be utilized to examine participation that occur during

brownfield redevelopments. There is no assumption of a causal relationship. Instead,

the framework offers a convenient summary and guide to the representation of

participatory activities (Contreras, 2019). The longevity of Arnstein's model attests to

its practicality to identify decision-making performed by which stakeholders, their level

of power, and how public participation practices are possibly integrated in the decision-

making process.

For this study, Arnstein's topology of participation was augmented to five

degrees of participation for assessment of Birmingham, Alabama's brownfield

redevelopments. Participatory elements are crucial, especially early in the project

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process, which occurred throughout Birmingham's brownfield redevelopment (Bartsch, 2003; Callahan, 2007; Cornwall, 2008; U.S. EPA, 2015; Kemp-Rotan, 2019; Schoonover *et al*., 2019). Summarizing the core project areas where citizen participation typically occurs include:

- Discussion of public/community needs and concerns;
- Project design; and
- Assess solutions/outcomes of project redevelopment.

These key participatory project areas are also supported by the technical literature and are part of the redevelopment project areas for which the participatory indicator is based (Bartsch, 2003; Callahan, 2007; Cornwall, 2008; U.S. EPA, 2015; Kemp-Rotan, 2019; Schoonover *et al*., 2019).

Although not representative of all the types of participatory activities and array of components in a redevelopment project, Arnstein's framework has been shown to be adaptable for application of environmental projects (Contreras, 2019). Arnstein's participatory measurements are used as an indicator for assessing citizen participation in the redevelopment process. Based on the technical literature and stakeholder input, central environmental project participatory areas were revealed to be: community needs and concerns input/planning, project design, and redevelopment outcome desired (Bartsch, 2003; Callahan, 2007; Cornwall, 2008; U.S. EPA, 2015; Kemp-Rotan, 2019; Schoonover *et al*., 2019). These key participatory areas along with other phases of the project utilized the following five step model to assess three local brownfield redevelopments in Birmingham, Alabama.

Research Model

The description of the five levels for the framework utilized to assess public

participation for the case studies of this research is as follows.

1 **'No Public Involvement'** – This level represents non-participative citizen involvement. The aim is to educate the participants. Through participatory activities, the goal is to achieve public support. Unfortunately, this level of public participation occurs often and is commonly experienced by communities.

2 **'Public Receives Information'** – Proposed project information is provided to the public. Generally, this step is considered an important aspect of legitimate participatory efforts. Often, the emphasis is on the dissemination of information one-way, non-dialogical and activity become a mere feedback channel and defeats the purpose of genuine participation.

3 **'Public Provides Feedback'** – This is a vital level or step in the participation model as information sharing not only occurs but citizens become involved in the process. Stakeholders have a vested sense of obligation to demonstrate public engagement. Often this level involves selected 'passive, safe participants' that easily adhere to processes provided by the power holders. This step is commonly seen as being performed for the appearance of participatory activities and lack process depth.

4 **'Public Decision-making Involvement'** – On this level, negotiations between citizens and power holders occur and redistribution of power transpire. Clear, transparent dialogue ensues and a commitment occurs to involve participants in planning and decision-making processes. Active citizens are delegated decision-making power where stakeholders have given much time and effort to engage the public who assure project accountability.

5 **'Public-Initiated Involvement/Task'** – This step of the ladder is a degree of power where participants have control of policy, decision-making activities. Citizens negotiate aspects of the project and negotiate conditions of the project with power stakeholders (Arnstein, 1969; Contreras, 2019).

This 5-level model allies with Arnstein's ladder of 8 degrees of participation. The

five levels for this study correspond to Arnstein's ladder framework as follows. Note,

details of Arnstein's framework will be discussed in the literature review section.

- Level 1: 'no public involvement' relates to Arnstein's ladder rung 1- manipulation and rung 2- therapy,

- Level 2: 'public receives information' relates to Arnstein's rung 3- information,

- Level 3: 'public provides feedback' relates to Arnstein's ladder rung 4- consultation and rung 5- placation,

- Level 4: 'public decision-making involvement' relates to Arnstein's ladder rung 6- partnership and rung 7- delegation,

- Level 5: 'public initiate task' relates to Arnstein's ladder rung 8- citizen control.

As in the case of this study and Arnstein's (1969) research, public participation can simply be categorized in term of citizen power. Arnstein (1969) defined this as the redistribution of power that enables those excluded from economic and public processes, e.g., the "have-not" citizens, an opportunity to deliberately be involved in future processes. Public participation in these processes allow the public to be part of determining how information is shared, policies are established, goals are set, and other activities that affect their quality of life and enable affected citizens the benefits of the affluent society (Arnstein, 1969).

For brownfield redevelopments, participatory activities must take into account the environment for which development will occur (Lange, 2001; Lange and McNeil, 2004; Solitare, 2005). Cultural, political, economic, and historical contexts are some of the aspects of an area that should also be considered in redevelopment plans (Stenseke, 2009; Abelson *et al.*, 2007; Sabatier *et al.*, 2005; Irvin and Stansbury, 2004; Vroom, 2003; Sobel *et al.*, 2001). To that end, the following is a discussion of the contextual aspects of the brownfield redevelopments in the city of Birmingham, Alabama.

Research Area

Located in the north-central part of Alabama and tucked away in Jones Valley,

Birmingham (Figure 1) is in Jefferson County and is one of the southernmost valleys of

the Appalachian foothills (Bhamwiki, 2017). Additionally, case study details are

discussed in Chapter 4 and Figure 4 displays the study area.

Figure 1: Google Map of the state of Alabama

During the second Industrial Revolution in 1871, Birmingham was born when the invention of a method for the mass production of steel was created (Bhamwiki, 2017). The city was named after Birmingham, England, which was England's major producer of steel. Because of its rapid industrial boom, Birmingham became known as the 'Magic City,' and was also later called the "Pittsburgh of the South" due to its iron and steel production (Bhamwiki, 2017). Much of Birmingham's success during its early history is attributed to its location at the intersection of two major rail lines and its proximity to an abundance to the three raw materials needed to form steel. These raw materials were coal, limestone, and iron ore. Additionally, in the early 1900s, labor in the South was cheaper due to non-union and African-American workers. This made Birmingham a preferred choice for industry unlike its counterparts in the North, Northeast, and Midwest.

The abundance of raw material, cheap labor, and ideal locale to rail lines led to Birmingham's growth in population by 245% between 1900 and 1910 (Bhamwiki, 2017). Until the 1960s, Birmingham was a major center for industries such as steel, rail, mining, and iron. Birmingham is still a fairly strong steel and coal mining industry, but it is definitely not operating at the level it once had. Today, Birmingham's economy has shifted towards biotechnology, medical research, banking, electrical power transmission, and telecommunications (Bhamwiki, 2017). Nonetheless, remnants of several of Birmingham's popular landmarks dating back to its industrial roots are very visible such as the Railroads (known as Railroad Park (RR)), Vulcan, and Sloss Furnaces (Bhamwiki, 2017).

Birmingham is the most populous city in the state of Alabama, with an estimated 210,710 residents in downtown and 1.13 million inhabitants in the greater Birmingham-

Hoover metro area (U.S. Census, 2017). However, Birmingham has experienced a decline in population since the 1960s. This decline has been attributed to "white flight" resulting from the Civil Rights movement (Hansen, 2011). Caucasians attempted to avoid desegregation by leaving the City for the suburbs (Hansen, 2011; Bhamwiki, 2017). This resulted in an abundance of suburbs surrounding Birmingham such as Homewood, Hoover, Mountain Brook, Vestavia, Bessemer, Pelham, and Gardendale (Hansen, 2011). The many suburbs surrounding Birmingham have been frequently taunted as being detrimental to its development (Beahm, 2019).

The U.S. Census indicated that both whites and blacks were moving out of Birmingham and into surrounding suburbs (Hansen, 2011). By 2010, a 37% population decline had occurred since 1960 which was 340,887 and Birmingham was predominantly black at 73.4% and whites made up about 21.1% (U.S. Census, 2017). While the suburbs surrounding Birmingham is part of the reason for its decline, there are a plethora of other reasons that Birmingham has not necessarily been a desirable city to work or live (Beahm, 2019).

For instance, Birmingham's image in the 1960s was severely damaged nationally and internationally as Jim Crow Laws were in place and public leaders fought to keep them (Bhamwiki, 2017). Many violent events occurred which earned Birmingham the nickname "Bombingham" after several racially-driven fires and bombings (Bhamwiki, 2017). In recent years, the Federal Bureau of Investigation (FBI) has named Birmingham as one of the most violent cities in the United States, ranking #5 (Kiersz and Brown, 2018).

While officials attempt to mitigate the causes of high crime rates, the rate of

poverty is often positively correlated with a higher crime rate. To that end, Birmingham

has a poverty rate of 28.1% versus Alabama's poverty rate 17.2% which is higher than

the national average of 14% (Taunton, 2018; U.S. Census, 2017, 2018). Jefferson

County, where Birmingham is located, reported that 66% of adults were either obese or

overweight compared to 36.3% obesity of the state of Alabama (Gore, 2018). In some

ways, this can be attributed to a lower income population as healthy foods tend to be

more expensive, limited or lack of grocery stores within reasonable distance, and the lack

of sufficient public transportation and the dependence on a car.

With the redevelopment of the downtown core, Publix Super Market, Railroad

Park, and other leisure and food choices have made being healthier an option and made

the downtown more desirable (Gose, 2013; Beahm, 2019). Although the downtown

population may be shrinking, there is a growth in housing demand and many new

apartment complexes and condominium units have gone up in downtown Birmingham

(Beahm, 2019; Kemp-Rotan, 2019). These capital investments have caused an increase in

rent and property taxes which has caused displacement of marginalized community

residents (Fowlkes, 2019). The redevelopment of brownfields has created a snowball

effect of downtown developments (Billmeier, 2019). In turn, these developments have

created an influx of higher income, more educated predominately white residents

relocating to the downtown which has caused an environment that manifest gentrification

(Fowlkes, 2019).

Although brownfields affect major cities in all states deeming it a universal

problem in the U.S., research reveals the social aspects of this problem as minority

communities usually bore a greater number of brownfields (Eisen, 1998; Bullard and

Johnson, 2000). Literature also points to the link between brownfield policies and environmental justice as communities where the brownfields exist may not benefit from redevelopment as others outside the community, e.g., developers and investors (Eisen, 1998; Bullard and Johnson, 2000). Even though the social and environmental justice topic is outside of this work, it can play a key role in the success of brownfield redevelopments (Eisen, 1998; Bullard and Johnson, 2000; Solitare, 2005; Essoka, 2010; Bryson, 2013; Fowlkes, 2019).

For Birmingham, some of their top priorities include items such as the revitalization of communities, downtown vibrancy, quality of life improvement/health, development of neighborhood centers, economic development/ more jobs, city beautification, affordable housing/mixed income, pollution control, mixed use development, grocery stores/retail establishments, crime reduction, improve city perceptions, draw traffic/youth, preserve neighborhoods, create parks, transit and walking/bike routes (City of Birmingham Comprehensive Plan (BCP), 2014). That said, brownfield redevelopment can positively impact many of these priorities either directly or indirectly. For instance, brownfield redevelopment can positively impact such items as the City's tax revenue by increasing property values and generating business revenue, increase traffic and youth visit to the downtown, reduce vacant or blighted properties, decrease air pollution by reducing the number of vehicles miles travelled, and improve the City's image and vibrancy. Based on the type of redevelopment, challenges such as an improvement of quality of life, health improvements, and City beautification can be addressed with the creation of a park such as the case with Railroad Park. This redevelopment is credited with igniting development in the downtown core (Billmeier, 2019).

Furthermore, downtown Birmingham has been ripe for projects that rehabilitate blighted areas in the city. That said, public involvement was a very instrumental component of the city's comprehensive plan (BCP, 2014). This element has often been associated with several successful brownfield redevelopments such as Railroad Park, the Lyric Theatre, and Regions Park (Wilborn, 2018; Billmeier, 2019; Kemp-Rotan, 2019). These projects and their integration of participatory activities will be the basis for this research. Each of the brownfield redevelopment projects will be discussed in Chapter 4, 'Brownfield Redevelopments: Birmingham, Alabama' section. Following is the selection criteria for Birmingham's brownfield redevelopments.

Case Study Selection Criteria

As the city of Birmingham continued to decline due to the exodus of businesses and residents which contributed to the loss in tax revenues and distressed properties, the City scrambled to implement projects that would infuse the revitalization of the its downtown core (BCP, 2014). The selected brownfield redevelopment projects were based on the premise that they were instrumental in redeveloping Birmingham's downtown core. The case study selection of Railroad Park, the Lyric Theatre, and Regions Field was based on the following criteria. Details of each redevelopment is discussed in Chapter 4 (Brownfield Redevelopments: Birmingham, Alabama).

- Participatory techniques occurred with stakeholders;
- Site redevelopment completed in the City's downtown core;
- Project appealed to the publics' needs;
- Project generate direct and indirect new business and residents to the area, i.e., snowballing effect; and,
- Projects' ability to aid in the renaissance focus of the City's master plan, i.e., project termed as pivotal for the revitalization of the city of Birmingham's downtown core.

The criteria were guided by the technical literature on the redevelopment projects and responses from the approved semi-structured stakeholder interviews and surveys (Appendix A and Appendix B). Survey and interview responses were based on stakeholder perceptions. In addition to the above criteria, selected projects were likely generated in one of three ways: government-initiated, owner/developer-initiated, or community-initiated. This additional condition of selection was performed in an effort to comprehensively compare further nuisances of each projects' public participation process. Advantages and disadvantages for each of the three types of project generation techniques are described as follows.

Community-initiated project pros and cons characteristics are as follows.
- Input from the community can promote or hinder project progress and outcome. Community input is a double-edged sword. Power of community activists can ensure community needs are addressed but this could change, impede, or prevent project completion or move the project to completion.
- The redevelopment process is fairly open and governmental regulations support public participation. However, strong citizen opposition to proposed redevelopment may cause project delays or even cancellation.
- Pro-bono planner or landscape architect services are often used for project design to illustrate the possibilities for redeveloping the site. There may be opposition to proposed redevelopment but not to the development of the site Berens, 2011).

Government-initiated project pros and cons characteristics are as follows.
- Government generated projects can often be viewed as having an autocratic vision that does not benefit the affected community or surrounding area.
- Timelines for brownfield redevelopments can be a long and arduous process and the terms of public officials, e.g., mayors and city councils, terms can expire before the pioneering project plans are completed. This could be bad if plans require renegotiation or good if plans are continued.
- Government typically becomes involved in redevelopments if its powers are needed to assemble land because of abandonment, disparate ownership, or bankruptcies.
- Controversy among government officials often causes redevelopment projects to be very political and take years for projects to come to fruition.
- Fear of government control can place a negative cloud on proposed redevelopment projects.

- Increases in taxes to offset costs associated with a proposed public project can cause strong community opposition (Berens, 2011).

Owner/developer-initiated project pros and cons characteristics are as follows.
- Projects are pursued by developers who have renovation expertise or enjoy challenges to transform abandon, dilapidated, or unused sites.
- Owners or property developers experience a certain level of autonomy that comes from owning the property.
- Given the private nature of the development, plans may not embrace the fabric of the neighborhood and become just another commercial redevelopment.
- Private development does not preclude public involvement which may become an issue if there is strong community opposition to proposed plans.
- The success of a redevelopment project is often based upon support and help from the government through such vehicles as tax benefits and relief of liability. Governmental regulations may be imposed such as public engagement, rezoning, and neighborhood impact analysis which may cause project delay (Berens, 2011).

Whether the project was initiated by developers, community groups, or government, participatory activities with the public as well as with local planning officials, neighborhood groups, and developers to resolve problems equitable to all stakeholders is ideal and may be a lengthy process.

Many individuals and community leaders have charged that despite the government's implementation of the public participation provisions within CERCLA's (Comprehensive Environmental Response, Compensation, and Liability Act), community decision-making involvement has been minimal (Kim, 2018; Solitare, 2005). Although the government has put forth the concept of community involvement in environmental restoration projects, it has never been manifested to its fullest potential (Solitare, 2005). This work examines redevelopments, investigates participatory activities, and explores the role of participatory processes in an effort to best incorporate meaningful public participation.

Limitation

This study could contain bias provided by the stakeholders. In addition, the research is limited to three local brownfield redevelopments that occurred in the downtown core area of Birmingham, Alabama. Research results are also based on minimal interviews and survey responses. This may contribute to bias as Birmingham has its unique historic, economic, cultural, and political environment.

The research methodology may also be considered a limitation. The study utilizes Arnstein's ladder of participation which is intended to establish a framework for the foundation to quantify brownfield redevelopment participatory activities. Other participation methods were not considered as most of them are an extension of Arnstein's model. The applicability and generalization of results may be limited to cities with similar characteristics as Birmingham, Alabama.

Overall, the goal of this research is to identify the effectiveness, strength, and weaknesses of the role of citizen engagement in brownfield redevelopments by comparatively analyzing three pivotal projects in the city of Birmingham, Alabama.

CHAPTER 2

LITERATURE REVIEW

This study evaluates the degree and type of participatory processes that were

performed in three local brownfield redevelopments in the downtown core of

Birmingham, Alabama. The review of the literature was centered on three topics: models

of citizen participation, evolution of citizen participation in community planning and

development, and citizen participation processes in brownfield redevelopments. The main

themes were identified and used to analyze participatory activities performed in three

selected brownfield redevelopments completed in Birmingham, Alabama.

This chapter advances with the contextual framework that is shaped mainly by

existing literature on brownfields, citizen participation models, and evolution of citizen

participation and participatory techniques in community planning/development,

environmental, and brownfield redevelopment projects.

Overview of Brownfields

According to the Small Business Liability Relief and Brownfields Revitalization

Act, amending the Comprehensive Environmental Response, Compensation, and

Liability Act of 1980 (CERCLA), the term a 'brownfield' site is defined as "real

property, the redevelopment, expansion, or reuse, of which may be complicated by the

presence or potential presence of a pollutant, hazardous substance, or contaminant" (U.S.

EPA, 2017a, 2017b). Perception of contamination would stigmatize property and could be labeled as a brownfield. It is estimated that currently 1 million such properties exist in the U.S., affecting all major cities and is deemed as a universal environmental problem (Davis and Sherman, 2010; U.S. EPA, 2017b). The U.S. EPA and other agencies have aggressively sought solutions to mitigate this problem by introducing legislation to promote public engagement in the cleanup and redevelopment of these problem properties (Davis and Sherman, 2010; .US. EPA, 2002, 2017b).

As the definition suggests, brownfields presents the potential to negatively impact many aspects of the environment, the community, and human health. It affects the air, land, and water causing illnesses to wildlife and community residents (Carson, 1962; U.S. EPA, 2017b). While brownfields present negative impacts and possible redevelopment challenges such as costs associated with cleanup and liability, there are many benefits which include restoring human health and returning the site to productive reuse, adding to the local tax base, encouraging local reinvestment, community revitalization, and generating jobs (USCM, 1999, 2000, and 2006; U.S. EPA, 2017a; ADEM, 2018). Therefore, it is important to understand how the extent of public participation in project decision-making may promote or hinder brownfield redevelopment.

Although citizen participation in such environmental and other public project decisions began with the workers' safety and health movement of the mid-1960s, it was the discovery of hazardous wastes in residential neighborhoods that spurred active public outrage and concern (Carson, 1962). However, one could attest that the pivotal evaluation of galvanizing citizens around environmental issues that impact human lives began with Rachel Carson.

Carson, known as the founder of the modern environmental movement quoted "the most alarming of all man's assaults upon the environment is the contamination of the earth, river, air, and sea with dangerous and even lethal materials" (Carson, 1962). She called for humans to act as stewards of the environment. In Carson's (1962) book, 'Silent Spring,' she documented more than six years of humans misusing persistent, powerful chemical pesticides before understanding the full potential of harm to the entire biota. Carson vehemently made the public and officials aware that pesticides such as dichlorodiphenyltrichloroethane (DDT) were devastating to the environment and to wildlife. Not only did her research document that DDT was being ingested by large birds such as endangered condors and eagles, but she had documented proof that DDT traveled through the food chain to humans and was detected in mother's milk (Carson, 1962). Her research showed that pesticides in drinking water and food could interact with each other and cause cancer in humans. In 1972, research findings in Carson's book, 'Silent Spring,' led the federal government to ban the use of DDT in the United States (U.S. EPA, 2020). This event was credited with the launch of the environmental movement.

Since Carson sounded the alarm on environmental and wildlife devastation by the misuse of chemicals, the occurrence of two major disasters – the Cuyahoga River fire and the Love Canal were also influential in spurring environmental legislation. The Cuyahoga River incident occurred because hazardous chemicals were dumped along Ohio's Lake Erie and the river that flowed onto Lake Eric caught on fire. The Love Canal environmental disaster resulted from the city of Niagara Falls building a residential complex over a capped hazardous waste landfill. This incident was the first time emergency funds were declared for an environmental disaster (Herbeck, 2018). Today,

Love Canal residents are still experiencing medical illness from the hazardous landfill and environmentalist speculate that families will continue to feel the effects of the environmental disaster (Herbeck, 2018).

These catastrophic environmental incidences led to legislation that mainly focused on regulating the chemical and petroleum industries' use and management of hazardous materials from cradle to grave. The environmental law, commonly referred to as the 'Superfund Act,' was enacted by Congress as the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) on December 11, 1980 (U.S. EPA, 2017b). This legislation granted federal authorities the power to protect the environment and human health.

In the 1990s, perceived ineffectiveness of CERCLA prompted states to develop their own environmental cleanup and redevelopment policy called the Voluntary Cleanup Program (VCP). Initially, VCPs were leveraged as vehicles for funds to cleanup large contaminated sites but evolved as viable reinvestment and economic development tools to foster redevelopment of brownfield sites (Alberini, 2007). The U.S. EPA took advantage of the growing interest in brownfield redevelopments and introduced several other brownfield programs (U.S. EPA, 2015, 2019). The new programs provided incentives for brownfield redevelopment, relief of liability, and reduced remediation costs (Lowham, 2007; U.S. EPA, 2018).

As of June 2019, the U.S. EPA's (2019) brownfield environmental programs include legislation such as the Brownfields Economic Redevelopment Initiatives, Brownfields Program, Small Business Liability Relief and Brownfields Revitalization Act of 2002 (Brownfields Act), Voluntary Cleanup Program (VCP), Brownfields,

Utilization, Investment and Local Development (BUILD) Act, and the Opportunity Act
(Opportunity Zones).

These programs reflect the emerging direction of brownfield cleanup and
redevelopment as a vehicle for community investment and economic growth (U.S. EPA,
2019). The Brownfields Act and its amended the BUILD Act, provides comprehensive
legislation regarding cleanup and redevelopment of brownfield sites. State VCP's
policies and initiatives operate in a less burdensome fashion than federal programs for
cleaning up and redeveloping brownfields (ADEM, 2018). Additionally, VCP's provide
liability relief and tailor cleanup requirements based on proposed future land use
(ADEM, 2018).

The growing interest and redevelopment of brownfields has created some issues
of equity (Maantay and Maroko, 2018). Recent government legislation, the Opportunity
Zone Act (Opportunity Zone (OZ)), was created to combat this problem (U.S. EPA,
2019). OZ was enacted as a way to promote redevelopment efforts in distressed
communities. Tax deferment is given in exchange for investment in an IRS designated
opportunity zone. Typically, hundreds of opportunity zones exist in each state in the U.S.
(U.S. EPA, 2019). Research has also indicated that early and continued public
participation in brownfield decision-making can contribute to mitigating issues of equity
(Brody *et al.*, 2003; Solitare, 2005).

A significant aspect of the U.S. EPA's Brownfields Initiative (2002) is the call for
active community engagement. The U.S. EPA (2019) used the brownfields pilot program
as a way to identify effective working models for meaningful public participation, which
would then be implemented around the country (Nolan, 2018). The U.S. EPA has

community participation as one of its selection criteria for brownfield grant participants (Nolan, 2018). The U.S. EPA also performs community involvement checks before and after a grant is awarded (Nolan, 2018). Site visits and telephone calls are performed to monitor and get updates on the level of public participation at brownfield sites around the U.S. (Nolan, 2018). This coordinated effort is significant as it gives credence to the necessity of giving the public a true voice in a process that could ultimately affect the quality of their future live and community. According to public officials, 'the EPA is committed to building partnerships with communities, cities, and states to develop strategies for promoting public participation and community involvement in brownfield redevelopment decision-making' (Favors, 2018; Nolan, 2018; Wilborn, 2018; Billmeier, 2019).

Though EPA's policy mechanisms are an excellent starting point to promote public participation, it does not go far enough (Solitare, 2005). Perhaps, the U.S. EPA's policies could require brownfield projects to employ the top level of public involvement, i.e., 'meaningful participation.' Often, town hall meetings, public notices, webcasts, and other lower level participation efforts are performed instead of the more interactive, community initiated decision-making participatory activities (Bartsch, 2003; Solitare, 2005; Contreras, 2019; Schoonover *et al.*, 2019).

In spite of the 1969 passage of the National Environment Policy Act (NEPA) that include provisions for "incorporating place-based identity and human values into the decision-making process, thus giving a voice to those who must bear the environmental, social, and economic, consequences of government policy and land use decisions," research indicates that there is still a need to effectively incorporate genuine public

participation in the decision-making process of brownfield redevelopments (Hendry, 2004; Solitare, 2005). Participation in brownfield redevelopment was found to be less than strong (Solitare, 2005).

Models, such as Arnstein's ladder of participation (1969), were developed to analyze and articulate a projects' participatory activities. This work utilized Arnstein's model as an evaluative tool to identify participatory activities and offer ways to integrate meaningful public participation in the brownfield redevelopment process (1969).

Citizen Participation Models

There are several known mechanisms to facilitate community participation. These include such activities as visioning, charrettes, community action planning, participatory action research, workshops, and strategic planning (Sanoff, 2000). Participatory methods can be chosen to address issues, adjust to the community, and adapt to the facilitator's experience. Wang's (2001) research surveyed public managers' perceptions about public participation and found that cities commonly used traditional forms of participation such as community or neighborhood meetings, public hearings, and community or citizen advisory boards. These forms were indicated as being significantly effective for meeting various dimensions of participation (Wang, 2001). In practice, Beierle (1999) suggested that only a few participation methods are utilized to achieve desired stakeholder outcome.

Literature also suggest that project type and various stages may dictate different levels of participation (Contreras, 2019). Nonetheless, higher levels of participation have been shown to have more impacts for stakeholders (Solitare, 2005; Contreras, 2019). This idea has been conceptualized by Arnstein's ladder of participation, one of the most prolific models that outlines the range of citizen participation. Arnstein's (1969) work was

influential for much of the theoretical literature that derived the typologies of participation.

Evaluative Role of Arnstein's Model (1969) in Planning

A continuum of citizen participation approaches and stakeholder power in the planning process was first articulated by Arnstein's ladder of citizen participation. She outlined this model in reference to the degrees of participation in various federal government programs and has since been applied to a wide array of contexts such as the assessment of participatory work in environmental development projects (Beierle and Konisky, 1999), post disaster projects (Davidson *et al*., 2007; Contreras, 2019), underdeveloped countries (Choguill, 1996) and tourism development (Tosun, 2006). Adaption to Arnstein's (1969) ladder of participation has been put forth such as Hart's (1992) focus on youth, Pretty's (1995) self-mobilization emphasis, White's (1996) arrangement of specific interests within participation, and the International Association for Public Participation's (IAP2, 2018) advancement of the practice of public participation universally. Although Arnstein's topology is one of the long-standing citizen participation frameworks, it has received many criticisms.

More recently, Bratt and Reardon (2013) suggest that Arnstein's work only offers anecdotal evidence that supports her ideas of how the forms of participation occur in practice. Cornwall (2008) criticized Arnstein's research as being limited in its normative approach. Arnstein's hierarchical approach was seen as not being useful in capturing the true problem, solution, and complexity of participation and it being one-dimensional and linear (Arnstein, 1969; Collins and Ison, 2006; Tritter and McCallum, 2006).

Furthermore, use of Arnstein's topology as an assessment tool of participatory project activities has been limited as it has been criticized for not providing specific methodologies to quantify the steps of the ladder and how to measure the levels of involvement. This led to debate by researchers that suggests less emphasis on the satisfaction and process aspects of participation and more focus on outcomes and impacts (Laurian and Shaw, 2009).

Despite the adaptions and critiques of Arnstein's ladder, it is still one of the most recognized and widely used approach to understanding project participatory activities (Cornwall, 2008; Kotus and Sowada, 2017). Opportunities to utilize Arnstein's topology to understand and examine the role of stakeholders in the participatory process related to environmental projects still exist. This research assesses participatory activities based on the degree of public empowerment (Rowe and Frewer, 2005). Specifically, this work investigated the extent of citizen participation decision-making or what is termed as empowerment in Birmingham, Alabama's brownfield redevelopments (Solitare, 2005; Contreras, 2019).

To this end, Arnstien's ladder emphasizes the redistribution and power structure of communities and individuals in the planning process. The major benefit of Arnstein's work is the model's simplicity to conceptualize participatory evaluation in terms of a ladder (Stoecker, 2014; Contreras, 2019). This analogy may be what contributes to Arnstein's widespread use. While stronger theoretical frameworks may exist, the popularity and familiarity of Arnstein's ladder of participation merit its use and may outweigh any theoretical shortcomings in the model. Although it is suggested that other topologies provide equal evaluation of project participatory activities, Contreras' (2019) work utilized

Arnstein's ladder of participation because of its historic importance outlining levels of
participation and citizen power in a linear fashion. Arnstein's (1969) and subsequent
participation topologies based on Arnstein's framework are discussed as follows.

Participation Topologies/Models

Arnstein's Ladder of Public Participation (1969)

One of the most cited topology of public participation is Sherry Arnstein's ladder
of public participation (1969) which depicts participation's multiplicity of meanings (see
Figure 2). Variations of her model were produced by subsequent models such as Hart
(1992), Pretty (1995), White (1996), and the International Association for Public
Participation (IAP2, 2018). Basically, these variations are of the same idea of ordering
the degrees of power-sharing between stakeholders, e.g., the public, developer, public
officials, investors, and community residents and organizations.

Categories	Levels of Participation
	Citizen Control
Citizen Power	Delegated Power
	Partnership
	Consultation
Tokenism	Informing
	Placation
Non-participation	Therapy
	Manipulation

Figure 2: Arnstein's Ladder of Participation (1969)

In general, typologies are a useful starting point for discerning the degrees and kinds of participation. The topologies are a series of ideal types of a range of participation forms that are implicit normative assumptions, along an axis of 'good' to 'bad'. Many of the typologies have utilized the 'ladder' metaphor to illustrate their perceptions of the participatory process. However, Arnstein's (1969) framework is the original model that outlined citizen involvement in decision-making and has been subsequently employed to evaluate many phenomena such as the political process of engagement (D'Agostino *et al.*, 2006; National Coalition for Dialogue & Deliberation, 2008).

Arnstein's model is grounded in the theory that declares citizen participation as citizen power. Key stakeholder power is typically associated with decision-making ability. Arnstein's theory (1969) suggests that true stakeholder decision-making participation is accomplished by sharing control and the redistribution of power.

With regard to this distribution, a total of eight levels of participation within three categories characterizes Arnstein's model (1969) which corresponds to the extent of citizen decision-making power in projects. The category of 'non-participation' is located at the bottom steps of the ladder. The participatory activities at this level include manipulation and therapy which are considered non-participatory. The manipulation level is seen as the appearance of participation just to demonstrate the use of citizen participation. Like the manipulation level, therapy is non-participatory and seen as providing a cure for marginalized groups and persuading participants to focus on the 'experts' agenda instead of focusing on the values of the broader public/community.

The next category is the degree of tokenism. This is Arnstein's model's middle category which consists of three rungs or levels (Arnstein, 1969). Informing, consultation, and placation are the three levels within the tokenism grouping. The informing level is typically described as providing project information at the later stages of the process, often discourages questions, and the information is seen as superficial (Arnstein, 1969). Consultation also allow community participants to be heard, provide opinion often with the use of surveys but mistrust occurs because results of input is not known. The last level within the tokenism category is 'placation.' This rung attempts to make participants feel that they are being heard, the marginalized groups are in an advisory capacity but again, the powerful stakeholders retain the authority to decide.

At the top of Arnstein's ladder is citizen control or what is commonly referred to as the degree of citizen power (Arnstein, 1969). Within this category, Arnstein (1969) draws a distinction between partnership, delegated power, and citizen control. Through her topology, assumptions of community and public empowerment is the ultimate goal of the role of power in the participation process. As such, the partnership step enables the public to be involved in and negotiate with powerful stakeholders. At the top rungs, delegate power and citizen control allows for citizens to be engaged in project development decision-making (Arnstein, 1969). Power or control is typically shared equally amongst stakeholders. The delegated power rung gives citizens the sense of ownership and often get involved from the beginning of project development. At the top level, citizen control provides full power to community, public stakeholders. Citizens have complete control over projects within their community which promotes the ultimate form of participation (Arnstein, 1969).

Participation as defined and describe by Arnstein (1969) requires an understanding of power. That is, each stakeholders' needs must be understood and allow each stakeholder the ability to achieve their goal. Although power is the main element of Arnstein's participatory model, money and information typically dictates the full extent of participation (Arnstein, 1969). Though participation could depend on other factors such as citizen's knowledge and key stakeholders may be uncomfortable providing this power to citizen, i.e., loss of project control (Pretty, 1995). Nonetheless, the technical literature has indicated that participation is often beneficial to all and can impact the projects' outcome (Bartsch, 2003; Solitare, 2005; U.S. EPA, 2017a). Adaptions to Arnstein's (1969) ladder of participation are as follows.

Hart's Ladder of Participation (1992)

More than twenty years after Arnstein's creation of her ladder of participation, Roger Hart's framework made adaptions to Arnstein's model for his research on youth involvement in the democratic process, i.e., decision-making process of public projects (Hart, 1992). Hart (1992) developed a model that investigated the participation of children in the participatory process. For the discussion of Hart's model, the use of youth, young people, and children are used interchangeably to represent individuals up to the age of 18 (Hart, 1992). This standard is based on the definition of a child being "a person not yet of the age of majority," which is 18 years old (Merriam-Webster, 2019).

Hart's ladder of participation is frequently denoted as the ladder of youth participation and was developed to assess participation of individuals that work with young people (Hart, 1992). His model was created with the assumption that youth have a voice, may not understand the participatory process, and often their involvement may be

minimized (Hart, 1992). Hart's (1992) model is also considered simplistic but some have

suggested it is radical as participatory efforts were designed to be inclusive of all

community members.

Moreover, Hart's model suggests that the health of a nation can often be measured

by the involvement of citizens in participatory processes. Hart (1992) also states that

community involvement should begin at an early age, be ingrained in youth, and be an

on-going effort. In turn, this could build youth credibility and confidence in decision-

making activities. Hart's ladder also contains eight steps within two categories (see Table

3). The first category which consist of three bottom rungs are considered non-

participation where youth involvement is not truly participation. The 'degrees of

participation' is the second category and consist of five rungs which describes active

participation and genuine engagement (Hart, 1992).

Table 3**:** Participation Model, Adapted from Hart (1992)

Degrees of participation	Action
8. Youth-initiated, shared decision- making with adults	Youth initiate projects and decision-making is shared with adults.
7. Youth-initiated and directed	Youth initiate and direct projects and adults are only in a supportive capacity.
6. Adult-initiated, shared decision-making with youth	Projects initiated by adults but decision-making is shared with the young people.
5. Consulted and informed	Youth gives project advice but outcome decisions made by adults.
4. Assigned but informed	Youth assigned a specific role and informed how they will be involved.
Non-participation	
3. Tokenism	Youth appear to have a voice but have little choice on participatory activities.
2. Decoration	Youth used to help the cause in an indirect way.
1. Manipulation	Youth typically do not understand the role or issues and manipulation often occurs at this level.

Depicted in Table 3, the bottom rung is manipulation which occurs when youth typically do not understand their role or issues and manipulation often occurs at this level. Decoration is the second lowest step where young people are often used to help the cause in an indirect way. At the tokenism rung, youth appear to have a voice but have little choice of participatory activities.

Subsequently, the 'degrees of participation' begins with the fourth step from the bottom of the ladder -- the 'assigned but informed' level. This is where young people are assigned a specific role and informed how they will be involved. 'Consulted and informed' is the next step within the degrees of participation category where youth are provided project advice but outcome decisions are made by adults. The 'adult-initiated, shared decision-making with youth' step consists of projects initiated by adults but decision-making is shared with young people. The following rung, 'youth-initiated and directed,' consist of youth initiate and direct projects and adults only serve in a supportive capacity. At the topmost level is the 'youth-initiated, shared decision-making with adults' step where the youth initiate projects and decision-making is shared with adults. Hart (1992) believes that participation is most meaningful if decision-making is shared between the youth and adults. Both Arnstein's and Hart's topologies assess participation from the citizen's (receiver) perspective however, Pretty's model addresses participatory approaches from the angle of public officials and the power stakeholders (Arnstein, 1969; Hart, 1992; Pretty, 1995).

Pretty's Topology of Participation (1995)

Jules Pretty's topology of participation, like Arnstein's ladder of participation, is considered normative. His model (Table 4) illustrates how the participation process contains discrete stages and processes from tokenism to independent action (Pretty, 1995).

Table 4**:** Topology of Participation, Adapted from Pretty (1995)

Category	Characteristics
Degrees of Participation	
7) Self-mobilization	Citizens initiate independent initiatives, exercise local control of resources and outcome, and invite external stakeholders to participate.
6) Interactive participation	Joint responsibility for stakeholder development, defining and achieving goals, and analysis.
5) Functional participation	Public has no real power sharing, their involvement looks good but decisions are taken externally.
Non-Participation	
4) Participation for material incentives	Citizens provide resources in return for short-term incentives but are not involved in long-term outcome.
3) Participation by consultation	Citizens provide feedback but there is no sharing of problem definition or analysis of responses.
2) Passive participation	Citizen take no part in decision-making and only receive information.
1) Manipulative participation	Pretense of participation but powerless and unelected individuals have no legitimacy.

Both Arnstein's and Pretty's frameworks describe a spectrum defined by a lower level that shift from control by powerful stakeholders (authorities) to control by citizens (the public/people). Pretty's topology provides clarity of the motivations of the stakeholders that practice and adopt participatory approaches and their importance in the

development process, whereas, Arnstein's topology shows that ultimately participation is about control and power (Arnstein, 1969; Pretty, 1995).

Using the ladder analogy, Pretty's topology has two categories – non-participation and the 'degrees of participation' and consist of seven steps (Pretty, 1995). At the bottom steps of Pretty's ladder are the four non-participatory activities of manipulative, passive, consultative, and 'material incentive' participation (Pretty, 1995). These levels range from 'bad' forms of participation to 'better' forms of participation. This would consist of citizens having no real power but token representation to decisions being previously made to citizen's participation in the short-term and no long-term involvement in the outcome.

Within Petty's top category, there are three levels that are considered 'degrees of participation'- functional, interactive, and self-mobilization (Pretty, 1995). At the functional participation level, the pretense that citizens have decision-making authority exist but the power stakeholders (external stakeholders) have control and there is no real power sharing among all stakeholders. This form of participation is often associated with citizen participation to meet project objectives more effective (i.e., efficiency argument) which is a frequent type of participation found in development projects (Rudqvist and Woodford-Berger, 1996).

Pretty's top two levels, interactive and self-mobilization, are viewed as addressing the goals of participation and promoting the use of participatory approaches in development projects in communities (Pretty, 1995). Citizen and local groups take control over project decision-making at the 'interactive participation' level. While, 'self-mobilization' has been seen as the ultimate level of participation in the 1980s and 1990s,

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Pretty (1995) describes this level as people taking initiatives independently of external stakeholder organizations/agents, securing resources and technical assistance, and controlling the development process and resources. He acknowledges the external threat that autonomous self-mobilization may pose but suggest that the humility of external stakeholders may be required as they do not know or should control every aspect of a project (Pretty, 1995). Pretty's (1995) argument also acknowledges the unique value that citizens and the local community bring to a development project which justifies them as being part of the participatory process. However, there is often inherent tension between citizen participation, empowerment, and control of the power/authoritative stakeholders. It is this dilemma that citizen participation in the concept of participatory process often represents a contradiction (Pretty, 1995). As expressed by Pretty (1995), participatory processes can be somewhat complex and uncertain. Therefore, deliberate attention must be made to ensure all voices are heard, especially the marginalized individuals, bias avoided, and integrity and honesty embedded in the process (Bartsch, 2003; Solitare, 2005; Maantay and Maroko, 2018, Schoonover *et al*., 2019).

White's Forms of Participation (1996)

A typology that provides insight into various forms of participation and the possible impact to various stakeholders was put forth by Sarah White (1996). White's work distinguished the motivation of both 'participants' and the implementing agencies promoting participation (White, 1996). She outlined (see Table 5) how participation may be used as a tool to identify conflicts of how and why participation was being used at any particular stage in a process.

Table 5: Forms of Participation, Adapted from White (1996)
Source: Models of Participation (2019) via Google.com

Form	What 'participation' means to the implementing agency	What 'participation' means for those on the receiving end	What 'participation' is for
Nominal	Legitimation – to show they are doing something	Inclusion – to retain some access to potential benefits	Display
Instrumental	Efficiency – to limit funders' input, draw on community contributions and make projects more cost-effective	Cost – of time spent on project-related labour and other activities	As a means to achieving cost-effectiveness and local facilities
Representative	Sustainability – to avoid creating dependency	Leverage – to influence the shape the project takes and its management	To give people a voice in determining their own development
Transformative	Empowerment – to enable people to make their own decisions, work out what to do and take action	Empowerment – to be able to decide and act for themselves	Both as a means and an end, a continuing dynamic

White's framework is referred to as the 'typology of interests' and has similarities to earlier topologies (White, 1996). White's model can be interpreted as implicitly normative as it progresses towards a 'genuine' form of participation (White, 1996). Analogous to the ladder-like structures of Arnstein's, Hart's, and Pretty's topologies,

White's model elaborates on participatory approaches and the power motives of stakeholders (White, 1996). For instance, the sharing of information may limit more active citizen participation, though, it could be argued that this information may ignite action to monitor consistency within development activities.

The transformative participation form of participation is at the bottom level of White's model (White, 1996). Both the power stakeholders and what White (1996) defines as 'implementing agency' and the public, referred to as 'receiving end,' have a different view of empowerment and what is meant by participation. This allows one to consider the accompanying narrative and not only view the representation of participation. White's topology illustrates conflicting ideological perspectives of all the stakeholders and their competing motivations (White, 1996).

As shown in Table 5, White's framework provides an explanation of contradictory motivations among stakeholders and potential conflict (White, 1996). Citizens that are without power leverage conflict as a necessity and healthy component of participation, whereas, the powerful stakeholders (e.g., authorities) anticipate these challenges and often times, make appropriate arrangements (White, 1996). For instance, the authorities may have established participatory processes that only engage a very small group of elite, articulate community members who may be content with being consulted on key issues or be content with receiving information. This scenario gives the impression that authorities are exercising efficiency by controlling project conflict and subsequent outcome. This can represent a conflict between ideas, prompted by self-interest and anticipation of project outcomes (Bartsch, 2003; Schoonover *et al.*, 2019). White (1996) acknowledges that participation is political as it represents the interests of

visible stakeholders. She suggests to exercise caution if there is not conflict (White, 1996).
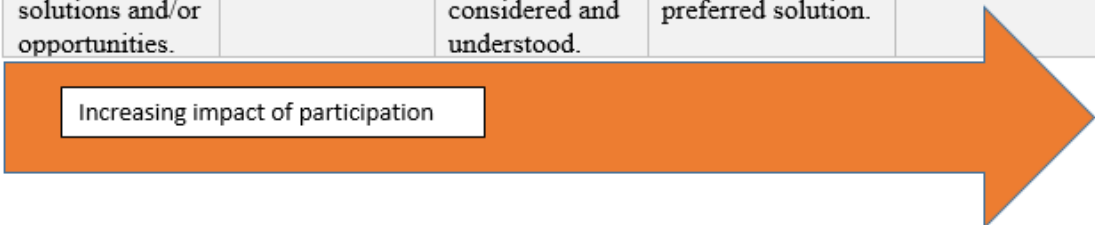
White's cautionary conclusion advocates that citizen engagement, in itself, invokes passion often leading to conflict and a project that lacks these elements should be cause for action (White, 1996). Analysis of participation in project development requires looking beyond visible stakeholders and consider external, perhaps invisible agents (White, 1996). Take for example, the parts to put together a bicycle tire are assembled on a table. The parts by themselves each have a function that contributes to the one main purpose of assembling and allowing the use of a bicycle (a system). However, all the parts can be assembled perfectly but the external pump must provide air in order for the tire to function. There can be a number of external agents that could provide air for a tire. This is analogous of White's framework for evaluating stakeholders' motivation (White, 1996). It is not always possible to assess all motives but as with White's model, this framework can serve as a starting point for mutual and meaningful stakeholder participation.

IAP2's (International Association for Public Participation, 2018) Topology of Participation (2018)

Similar to Arnstein (1969), the International Association for Public Participation's (IAP2) topology of participation utilizes the analogy of a ladder and levels of participation. Shown in Table 6, IAP2's model indicates the impact of the levels of citizen participation in project decision-making as increasing moving from left to right (IAP2, 2018).

Table 6: Adapted from the International Association for Public Participation (IAP2), Public Participation Spectrum (2018)

INFORM	CONSULT	INVOLVE	COLLABORATE	EMPOWER
Provide public with objective and balanced information to understand alternatives, problems, solutions and/or opportunities.	Public feedback is obtained based on alternatives analysis and/or decisions.	Direct public engagement to ensure that public aspirations and concerns are consistently considered and understood.	The public is a partner on all aspects of project decision-making including alternatives, identification and preferred solution.	Final decision-making is held by the public.

Increasing impact of participation →

IPA2's topology is an attempt to define citizen participation in the participatory process for project decision-making in the U.S. and Internationally (IAP2, 2018). It contains five types of citizen engagement: inform, consult, involve, collaborate, and empower (IPA2, 2018).

In the 'inform' and 'consult' levels, citizens are less powerful and typically unable to change decisions that may affect them. The public is given information about the proposed project at the 'inform' level which is bottom step of the participation model

(IPA2, 2018). Examples of participation mechanisms include public meetings and hearings, brochures, and the internet (Beierle and Cayford, 2002; Mostert, 2003). Considering feedback received from the public based on disseminated information by authorities is part of the 'consult' level of participation. Participation mechanisms include participatory approaches such as interviews, surveys, and public meetings (Mostert, 2003).

An understanding of citizen concerns and contributions are established at the 'involve' level. Building consensus amongst all stakeholders is complex which is the main focus of the 'collaborate' level of participation where the public is involved in decision-making in every aspect of project development (Margerum, 2011; IPA2, 2018). IPA2's top most level is 'empower' (IAP2, 2018). Citizen empowerment provides the public with an opportunity to make final project decisions. This can be achieved through mechanisms such as workshops, small group meetings, work with key stakeholders, and conducting charrettes (Mostert, 2003; Samuelson *et al*., 2005).

Illustrated in IPA2's spectrum of participation and the theoretical definition of participation, the higher levels of participation reflect meaningful participation and benefits of citizen participation can truly be recognized (Mostert, 2003; IAP2, 2018). Conversely, lower, bottom levels of participation are often seen as the pretense of participation and can be considered forms of non-genuine citizen participation (Arnstein, 1969). Although many topologies consider informing the public to be non-participatory, the basic foundation of the participatory process considers informing the public as mandatory and should build from this point and not be the end (U.S. EPA, 2002).

Though studies have found citizen participation to be influential in the decision-making process, participation appears to still occur at the lower levels (Lange, 2001;

Wang, 2001; Solitare, 2005). This lack of depth in participatory processes warrants further investigation of how to evaluate and best incorporate participation in redevelopment projects. Additionally, the discussion of topologies of participation and possible detailed disaggregated analysis of causal links between different forms of outcomes and forms of participation is important but beyond the scope of this work. This study will explore participatory approaches implemented in successful brownfield redevelopments and how the extent of public participation in project decision-making may promote or hinder brownfield redevelopment.

An array of participatory approaches is offered by the models presented in this study. Models can be adapted to fit different projects, circumstances, goals, etc. In this dissertation, it is not possible to explore all the projects' complexities and core components but attention should be paid to local context and diversity of ideas. Cultural, political, socioeconomic, ideological, scientific, etc., are all context aspects that should be considered when implementing participatory processes for project decision-making (Randolph, 2004; Solitare, 2005). These aspects are important factors influencing brownfield redevelopments in the city of Birmingham and they will be explored along with the use of Arnstein's ladder of participation as an evaluative tool to examine the extent to which participatory elements may have had influencing redevelopment outcomes.

Evolution of Citizen Participation in Community Development and Planning

Historic Review of Planning Approaches and Citizen Participation

Community or city planning and development gained prominence in the eighteenth and nineteenth centuries in response to economic and social problems (Hall, 2002). The Industrial Revolution prompted growth in urban areas but regulatory codes were not established for developing cities, nor did earlier city planning processes have elements of community participation as a part of its required policy (Hall, 2002). Planning efforts were often focused on resolving growth and economic and social issues. Subsequent planning concepts however, did have elements of participatory activities (Hall, 2002).

For instance, comprehensive or land use planning is not a new concept but has taken many forms or approaches. These approaches were usually determined by community issues or needs. One of the first land use plan established colonies in Williamsburg (Goodman and Fruend, 1968). In 1699, the original Williamsburg town plan was referred to as 'axial planning.' This plan was the most formal land use design for its time (Goodman and Fruend, 1968). This fact is somewhat debatable as modern city planning in American is said to have begun with the 1893 Columbian Exposition (Goodman and Fruend, 1968).

With enormous urban growth in the nineteenth century, minimum attention was paid to planning which resulted in urban crowding and poor land use development. This led to many movements such as City Beautiful, the sanitary reform, housing reform, the Chicago Plan, and the first comprehensive zoning ordinance in New York. In the 1900s, the development and growth of the planning era began in Washington, D.C. during the

annual American Institute of Architect meeting (Goodman and Fruend, 1968; Levy, 2009). Papers were presented on the beautification of government buildings and this is what prompted one of the first community developments. Plans for the park system of D.C. were designed, committees were appointed and the final plans for the park system was completed in 1901 (Levy, 2009). The planning process for the park system was known as the 'City Beautiful Movement' (Goodman and Fruend, 1968; Levy, 2009).

Other pivotal planning programs include: the sanitary reform movement which protected urban open space; the housing reform regulated tenement housing which created planning departments, mandated light and air spaces, toilets, and required inspections; and the Chicago Plan which was the beginning of modern planning and the creation of comprehensive planning which was influenced by planners, citizens, and politicians (Goodman and Fruend, 1968; Levy, 2009). Moreover, Edward Bassett, in 1916, designed the first comprehensive zoning ordinance that was implemented by New York which detailed how land use for subdivisions and district ordinances were to be developed (Goodman and Fruend, 1968; Levy, 2009). These movements, especially the "City Beautiful Movement," laid the ground work for todays' comprehensive planning. Two main planning aspects of the City Beautiful Movement are still used today - the establishment of a planning commission and the use of a comprehensive land use planning consultant (Goodman and Fruend, 1968).

Comprehensive planning is considered an all-inclusive approach that employs participatory elements to address the growth of communities and establish policies. This would include a range of approaches, theories, and perspectives such as synoptic rationality, transactive, advocacy, and collaborative or communicative planning. These

approaches are not an exhaustive list but provides the foundation for many of the participatory frameworks in planning approaches that contain community participation aspects that are still in use today and are discussed as follows.

Synoptic Planning

According to Hudson (1979), the synoptic rationality approach is one of the most frequently used comprehensive planning method. Hudson (1979) suggested that at one level, synoptic planning represented a continuance of the rational-comprehensive paradigm and at another level, it represented a departure from blueprint planning. Hudson (1979) also indicated that synoptic planning was the starting point for a number of alternative approaches that resulted from its shortcomings.

Although synoptic planning is one of the simplest approaches, it is a comprehensive, rational planning technique with varying participatory elements to engage all stakeholders in development processes (Hudson, 1979). This approach is designed such that planning practitioners or executives (authorities) formulate goals, oversee implementation, measure outcomes, and make goal adjustments based on organizational and environmental conditions (Hudson, 1979). As defined by Hudson (1979), the four principal elements for which synoptic planning addresses include: setting of goals; identification of policy options and implementation of the preferred alternative; prediction of the environment and use of quantitative analysis; and, evaluation of means against ends. Within this process, the planners' relationship with the public is viewed as holistic (Hudson, 1979). This unitary, homogeneity public interest is a major criticism of the synoptic perspective though, public participation was born out this approach (Hudson, 1979).

Furthermore, Hudson (1979) and Hall (1983) argued that the changes in urban geography required planners to examine problems from "a systems viewpoint, use mathematical or conceptual models relating ends (objective) to means (resources and constraints), and rely heavily on quantitative analysis -- decisions are based on gathering data through observation, modeling, or statistical analysis." Nonetheless, alternative schools of planning take issue with aspects of this approach such as its restricted logic and the challenges of historic application (Hudson, 1979; Hall, 1983).

Despite criticisms of the synoptic planning, it is simple, is the foundation from which other approaches were designed, and parts of the approach remain in use today (Hudson, 1979). This approach also assumes that there is community consensus. As Faludi (1973) indicated, synoptic planning assumes goals are universally shared and society has homogeneous interests. This is not necessarily the case today and is often considered the Achilles heel for many failed projects (Bingham *et al*., 2005; Schoonover *et al*., 2019). Moreover, planning goals are assumed to be validated by public participation which would be key to gaining buy-in and support for proposed brownfield redevelopment projects. If public or community consensus does not exist, a redevelopment project could be doomed from the offset (Bartsch, 2003).

The advantage and strength of the synoptic/relational approach lie in its simplicity (Hudson, 1979). The well-defined step-by-step approach (i.e., define the problem, goals, measure outcomes, make adjustments, and make final decision) allows for the ease of developing solutions to difficult problems (Hudson, 1979). This framework is based on scientific data which minimizes the risk of uncertainty, distortions, subjectivity, and the chance of errors (Roos, 1974). Though, this rational comprehensive planning approach is

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simplistic, emphasis has shifted to forms of planning that have public and community

participatory elements which focus on more complex issues that address all stakeholders'

interests (Levy, 2009; Schoonover *et al*., 2019).

Transformative Planning

As a means to overcome shortcomings of synoptic planning, Friedmann (1973)

developed transactive planning. Friedmann's (1973) work began a new era of public

participation in the planning realm. Transactive planning is rooted in social

transformation planning which is based on communicative rationality (Friedmann, 1987).

Human communication and dialogue between affected communities and planners is the

emphasis of this rationality. This approach is often described as planning by the people,

for the people (Friedmann, 1987).

Public or community participation is integral to this planning method (Friedmann,

1987). An important goal of this approach is to decentralize planning institutions by

providing the public with the power to control and direct social processes for which, has

direct impact for determining their welfare (Hudson, 1979; Friedmann, 1994). In this

sense, transactive plans argue that improvements to the quality of life are more important

than delivering services. Community empowerment, participation, and mutual learning

are main aspects of this approach (Hudson, 1979). Participatory elements such as

community participation and empowerment and face-to-face contact with the planning

community are the underlying assumptions and principles that form the basis of the

transactive planning practice (Hudson, 1979).

In a broad sense, the array of planning techniques typically can be summarized as

being inclusive of planners (i.e., the authoritative group), organizing committees, data

collection and analysis, facilitating community meetings and participation, setting

policies, and refining project plans (Hudson, 1979). In the case of the transactive

approach, the public or community would control a majority of the planning process for a

proposed project which is analogous to Arnstein's top ladder level of 'citizen control'

(Arnstein, 1969). Face-to-face activities would also be held throughout the planning

process. A targeted focus for an optimal project outcome would be one that improves the

lives of individuals in the community (Rast, 2006). For instance, a majority of

brownfields are located in low income, distressed areas, and a redevelopment that

featured quality of life components such as a parks, recreation facilities, and/or a

neighborhood Walmart store may serve the community better than a high-end mix used

development (Maantay and Maroko, 2018). Transactive planning relies heavily on the

democratic process and the public/community pretty much owns the entire planning

process and planners would only serve to provide information and feedback (Hudson,

1979).

The public/human dimension of transactive planning is often considered the main

asset of this approach (Hudson, 1979). The active role and dialogue that the public or

community has in setting policies also supports the social aspects of this approach. The

fact that planners play a limited role in this approach can be seen as a vulnerability,

especially with complex projects such as planning a brownfield redevelopment. A project

of the size and scope of some brownfields would require critical, technical knowledge.

To that end, public or community stakeholders may not have the capacity to

effectively understand all the dimensions of a complex project such as a brownfield

redevelopment which could introduce a factor of risk. This could result in more damage

to the community than good which may lead to less desirable outcomes such as increase

in cost and completion time, project abandoned, or the delivery of a new, unwanted

project (Mostert, 2003; Reed, 2008; Luyet *et al*., 2012).

Advocacy Planning

Another foundational approach that laid the framework for participatory elements

in community development was advocacy planning. In the 1961, Paul Davidoff (1965)

developed the advocacy planning approach. Advocacy planning was based on adversarial

procedures found in the legal profession and was formed in response to the shortcomings

of the synoptic model. The central argument of this approach is that the interest of the

poor and weak must be defended (Davidoff, 1965). This stance is the underlying

principles that the U.S. EPA (2002) and other agencies promotes through its grant

programs.

Advocacy planning was built on the foundation that there was: (1) a serious

disparity of bargaining power between groups, (2) a profound imbalanced of access to the

political structure, and (3) an enormous number of unorganized people who were

unrepresented by interest groups (Mazziotti, 1982). These inequalities are the tenets of

advocacy planning which aspires to accommodate and represent all people in the

planning process (Davidoff, 1965).

This approach begins with the assumption that people share political powers.

Social and political pluralism are shared where planners basically facilitate central task as

the catalyst for people who are not able to represent themselves (Davidoff, 1965).

Planners serve to ensure that the interests of the weak are defended and they do so

openly. Public participation is inherent in this approach. All players would have equal

input in policy decision-making and the entire planning process. For instance, development projects that only serve to benefit developers, investors, bankers, etc. and displace disenfranchised citizens, could not occur utilizing this planning approach. All voices of people involved are heard and equal weight would be exercised on all planning and policy matters. Perhaps, a mixed use redevelopment that would accommodate housing for a percentage of lower income citizen would be a good policy to implement and option for a development project that could accommodate outcome desires of all stakeholders.

Advocacy planning falls within the radical social transformation tradition by being concerned with advocating the interests of the less fortunate on the grounds of seeking social change to improve the conditions of the disenfranchised (Mazziotti, 1982). This approach often relies on democratic/inclusionary processes to ensure that all voices are equally heard and the necessary policies are created to accomplish objectives (Mazziotti, 1982; Clavel, 1994). For example, a brownfield redevelopment project may be acceptable to all stakeholders if a condition existed such as one fourth of its housing units be allocated for elderly and lower income citizens. Within the planning framework, public participation is implicated that would utilize democratic processes.

The interests and needs of the public is the key strength of the advocacy approach (Clavel, 1994). However, the limited role of planners could make development projects vulnerable. As is the case with transformative planning, advocacy planning participatory activities may be complex, require in-depth technical skills that are not usually inherent in the average citizen (Clavel, 1994). Case in point would be a neighborhood complex brownfield redevelopment. The public or community could have a more proactive role.

However, planning for a successful brownfield redevelopment is very complex and convoluted and normally requires the skillsets of a seasoned practitioners. Redevelopment projects can be beneficial to all stakeholders if planned and executed correctly but could be very costly if it is not.

Communicative/Collaborative Planning Approach

Literature indicates that the advocacy and transformative planning approaches do not possess the deep level of understanding public interests required to appreciate how people act and learn (Healy, 1996). By the 1980s and early 1990s, a radical planning approach emerged - the role of planning and understanding social phenomena (Healy, 1996). This communicative or collaborative planning model is a technique that takes into account the roles of the people for implementing better planning processes (Healy, 1996). This is a widely practiced theory that gathers stakeholders and engage them in the participatory decision-making process. That is, this model is based on social communication and dialogue between citizens affected by redevelop-ment plans and planners.

In addition, literature indicates that the communicative process entails multiple rationalities – the theory of discursive democracy (Dryzek, 1990), Gidden's (1994) theory of dialogic democracy, and Habermas' (1984) theory of communicative rationality (Lane, 2005). Moreover, the purpose of communicative planning is organizing the possibility for action (Forester, 1989). This planning approach encourages public participation which places citizens and stakeholders in central roles of the planning process. Activities such as consensus building are utilized to promote citizen participation but all participation is not meaningful or strong (Solitare, 2005).

Healy (1996) suggest that for participation to be strong and meaningful, decision-making should be based on the concepts of communicative planning. This is the case for brownfield redevelopments as authentic public participation plays an important role in the participatory decision-making processes (Healy, 1996; Bartsch, 2003; Innes and Booher, 2004; Solitare, 2005). Specifically, all stakeholders' voices are heard as planning emphasis is on goals of environmental and social justice (Solitare, 2005).

Similarly, an important aspect of the communicative planning paradigm is to share power, that is, decision-making processes are equal and fair amongst stakeholders. This is crucial for building consensus and promoting creative thinking, trust, and openness (Innes, 2004).

However, critiques of communicative planning are whether consensus is a valuable goal and if a consensus-based process can be transformed into authentic outcomes (Purcell, 2009). Moreover, the concept of power is questioned. These questions are based on who will have the power to include or exclude stakeholders; and, will power be abused by stakeholders to unfairly influence or manipulate the consensus building process (Tewdwr –Jones and Allmendinger, 1998). These arguments support the claim that collaborative planning is to seemingly represent the public better but it is only a way to maintain larger institutional and political structures (Purcell, 2009). Instead of real changes being implemented in the governance structure, the critics view collaborative planning as a way to stabilize political systems and keep neoliberals in power (Purcell, 2009).

Nonetheless, communicative or collaborative planning promotes a high level of participation which has been linked to successful redevelopment outcome (Bartsch, 2003;

Solitare, 2005; U.S. EPA, 2017a). Advocacy, synoptic rationality, transactive, and communicative/collaborative approaches all have parts that are intertwined and aspects of these paradigms are used in today's participatory activities.

Public participation is engrained in public policies and planning processes and is often a requirement in development projects (U.S. EPA, 2002). Often, power stakeholders adapt their processes to accommodate citizens as they expect the public to be involved and offer valuable feedback and input (Brooks, 2002; Faga, 2006). However, providing the opportunity to participate does not ensure meaningful participation as genuine and honest engagement is necessary (U.S. EPA, 2002; Solitare, 2005; Schoonover *et al.*, 2019). Trust and a sense of ownership is often associated with active participation by all stakeholders as everyone shares in the decision-making (Langsdale *et al.*, 2009). Empirical evidence has shown that meaningful public participation can be difficult to obtain (Margerum, 1999). Socio-economic status factors such as income and education have been shown to positively correlate to public participation (Williams *et al.*, 2001). These factors inherently could leave out a group of affected citizens thereby omitting the critical aspect of addressing their needs and concerns in the redevelopment.

The implementation and maintenance of participatory, collaborative processes is not a simple task as it requires continuous commitment which could present significant challenges for all stakeholders (Margerum, 1999). Although planners support participatory efforts, they are often critical of its bureaucratic nature behind closed doors (Brooks, 2002). Putnam's (2000) work suggests that involvement of citizens in key decision-making projects, such as environmental-related projects, require meaningful, strong democratic participation and an educational component. Environmental projects are

on the rise and implementing educational components in the planning framework may be beneficial as these projects can be complex.

Implementation of Citizen Participation in a Framework

Arnstein's model was introduced during the social turbulence and a significant historic decade in this country. Martin Luther King, Jr., Malcolm X, and Kennedy were assassinated. Civil and voting rights, the Vietnam War, housing, discrimination, and many other rights were being protested. Environmental and health movements were taking place -- this country was in total turmoil. The efficacy of the concepts of public participation in planning was relatively new and Arnstein's work defined and often challenged the paradigm of the planning process. She stated that 'there is a critical difference between engaging in empty rituals of participation and possessing real power needed to affect the process outcome' (Arnstein, 1969).

Arnstein's work was pivotal as it introduced the concept of 'degrees of participation' in reference to the amount of power provided to the public which correlated positively to planning outcomes that represented public interests (Arnstein, 1969). The most significant component of Arnstein's (1969) ladder of participation is power and the degree to which the public (affect residents) has a meaningful opportunity to influence the planning process (Lane, 2005). Though Arnstein's topology may not have proposed or introduced new planning techniques, its timely submission reflected the changing attitudes towards the importance of public participation in planning and to the decision-making processes (Arnstein, 1969).

Even though citizen participation in the administrative process emerged in the late 1960s and 1970s (Spiegel, 1968; Arnstein 1969), there is only modest empirical data on

the effects that citizen participation programs have had on public policy and the administrative process (Kraft *et al.*, 1991). Citizen participation is incorporated in government grant proposals but with no formal mechanism to tract or evaluate brownfield redevelopment participatory activities, though, findings suggest that citizen participation is limited in project decision-making (U.S. EPA, 2002; Solitare, 2005; Michels and De Graaf, 2010).

The emergence of new societal obligations for environmental and developments projects, often require some form of participation (U.S. EPA, 2002). Citizen participation is a vital part of mitigating public perception of apprehension and negativity of environmental and brownfield redevelopment projects and warrant further research (Arnstein, 1969; U.S. EPA, 2002; Bartsch 2003; Michels and De Graaf, 2010; Maantay and Maroko, 2018; Schoonover *et al.*, 2019). Early studies defined citizen participation as the process by which programs can meaningfully be tied to people (Spiegel, 1968). Sherry Arnstein (1969) subsequently defined citizen participation as 'the redistribution of power empowering citizens, presently excluded from the political and economic processes, to be deliberately included in future policy decisions.' Arnstein (1969) also defines the amount of control citizens have over policy decisions in terms of three levels, which are broadly categorized as Nonparticipation, Tokenism, and Citizen Power.

Efforts by the government and subsequent evolving political and social systems, have enhanced the public's ability to be part of a collective policy decision process (Arnstein, 1969; U.S. EPA, 2002). Stakeholders' (e.g., citizens, businesses, environmental organizations, and politicians) concerns of environmental issues such as land revitalization and conservation, increased energy costs, and deteriorating air quality

demand for solutions, are all instrumental in the government's heighten environmental

policy focus over the past decades (Arnstein, 1969; U.S. EPA, 2002). As such, citizen

involvement has been used as a mechanism to foster support and build consensus for

community development projects (Bartsch, 2003; Michels and De Graaf, 2010;

Contreras, 2019). Citizen participation, also referred to as public involvement or public

engagement, often consist of participatory activities such as outreach, consensus building,

and education all which are very important elements in addressing public concern while

diminishing perceptions of project risk (Arnstein 1969; Rayens and Hahn, 2000;

Godschalk *et al*., 2003; Solitare, 2005; Oulahen and Dobersten, 2010; Berens, 2011). Use

of these participatory techniques can prove beneficial in building community relations

and confidence, while minimizing public opposition to policies and projects development

(Schoonover *et al*., 2019).

In practice, citizen participation models have been coined as the staple of local

plans for which, federal, state and local laws encourage, urge and in many cases, require

citizen involvement in the plan making process (U.S. EPA, 2002; Godschalk *et al*., 2003;

Cottrell, 2005). To increase citizen participation in environmental projects, three planning

approaches/models have been mainly used during the 20th century.

The first approach, the good government reform movement was developed in the

early 1900s (Godschalk *et al*., 2003). This model was based on participatory elements

such as public hearings and blue ribbon advisory committees (Godschalk *et al*., 2003).

This advisory model relies on citizen input through public hearings and committees.

Public hearings are designed for citizens to voice their comments on such items as

proposed projects, plans, and ordinances, to local elected officials (Godschalk *et al*.,

2003). This technique is still widely used, however hearings are criticized for encouraging organized opposition rather than collaborative problem solving, and also criticized for occurring late in the planning process (Godschalk *et al.,* 2003; Cornwall, 2008). Advisory committees are also designed to provide regular advice to local officials. Although this practice remains widely in use, it has also been criticized for not including a full spectrum of community interests (Godschalk *et al*., 2003; Solitare, 2005).

Consequently, the advisory model was replaced in the 1960s by a model of collaboration and power-sharing (Godschalk *et al*., 2003). Elements of this collaborative model provides citizens and stakeholders with a significant degree of power, which allows citizens and authoritative stakeholders to engage in community participatory activities such as designing, selecting and implementing plans (Solitare, 2005; Godschalk *et al.*, 2003).

The model of 'conflict management and dispute resolution' is the third community participatory model which came to the forefront of planning in the 1980s (Godschalk *et al*., 2003). Techniques used in this model consist of participatory activities such as consensus building and dispute resolutions. Mediation of disputes and facilitating negotiation processes for successful decision-making for project development and policy making are the key aspects of this model (Godschalk *et al*., 2003). Various techniques of this model have been adapted in later topologies in the form of the collaborative level of participation (IAP2, 2018).

In all three models, citizen participation processes in some form has elements that allows citizens to engage in decision-making in community development projects. These earlier models have been used successfully to address and mitigate public concerns, build

trust, and promote acceptance which could serve as a framework for engaging the public in participatory activities in brownfield redevelopment decision-making (Schoonover *et al.*, 2019).

Citizen Participation Processes in Brownfield Redevelopments

As described by Sclove (1995), the argument for citizen participation in environmental project decision-making is to empower citizens as they should be instrumental in determining their society's basic structure. The basic tenant is that decisions done politically can have a major impact on the lives of citizens so, citizens should be empowered to have direct decision-making and input to decide on issues that directly affect them. When allowing environmental project decision-making be open to citizen participation, the process typically gains legitimacy from the public (Solitare, 2005). Regardless of the outcome, Armour's (1992) and Freudenburg's (2003) work showed that the public tends to accept project outcomes as being fair and valid if citizens are part of the participatory process.

Public participation is essential in environmental and land-use decision-making as the public is directly impacted by issues of public health or safety such as the case with brownfield redevelopment (Bartsch, 2003). The U.S. EPA (2002) and other agencies support this idea as participatory elements are embedded in their brownfield policies. Most requirements consist of, at a minimum, public hearings of issues that affect citizens and the environment (U.S. EPA, 2002; Bartsch, 2003).

Environmental and revitalization projects resurrected in the 1990s with the U.S. EPA's (2019) 'Pilot Brownfield Project' grants. While focused attention is on brownfield

redevelopments, there is still a need to understand how to effectively incorporate meaningful participatory elements (U.S. EPA, 2002; Solitare, 2005; Schoonover *et al*., 2019). Brownfield redevelopment projects are usually more complicated as there are many influencing factors. For instance, two or more planning authorities such as economic development departments, regional planning organization, city planning department, the Mayors' office, are part of the process and can create conflict interests.

Moreover, the brownfield process typically has many components which require participation of various stakeholders who have varying interests and needs (Bartsch, 2003). The complexities to understand roles, actions, and responsibilities can add to decision-making challenges (Carnes *et al*., 1998). Despite regulations and guidelines, stakeholders may have their own participatory process which could impact redevelopment project outcomes (Forester, 1989; Carnes *et al*, 1998; Schoonover *et al*., 2019).

From the aspect of participation, before the social transformations of the 1960s and 1970s, the Urban Renewal Act of 1954 was considered the first example of mandating citizen participation (Teaford, 2000). The primary form of public participation was public hearing and still remain todays' dominant type of participatory activity (Roberts, 2004; Solitare, 2005). Arnstein's Ladder of Citizen Participation indicates that this form of participation is non-participation as are many forms of public participation (Arnstein, 1969). More human, public contact forms of participation are critical to successful brownfield redevelopment which fall into Arnstein's categories of higher participatory levels of 'citizen power' and tokenism (Gallagher and Jackson, 2008; Berens, 2011; Schoonover *et al.,* 2019).

The higher level of participation is important as it inherently establishes

connections among stakeholders and mutual goals can be genuinely addressed (Arnstein,

1969). This form of connection is termed social capital of which, social networks can

build and trustworthiness arise from the relationships (Putnam, 2000). The key social

capital concepts of trust and relationship can occur in both a direct and indirect

participatory manner (Mandarano *et. al*, 2010). For instance, public meetings are indirect

and more generalized forms of participation. Indirect relationships are established and

often create community mistrust of pubic project processes, e.g., a brownfield

redevelopment, whereas, direct one-to-one participatory elements can establish a genuine

setting to build trust and relationships, e.g., shared participatory decision-making

amongst all stakeholders (Mandarano *et. al*, 2010).

Brownfield redevelopments have a strong social link as they are tied to

communities, its identity, and values (Bartsch, 2003). Taylor (2000) suggests

environmental problems are social problems since the problems are societal in nature and

can be defined by the public. The participation of the public or community is important as

they can articulate community needs and concerns, provide local knowledge, influence

policy, and empower individuals (Bartsch, 2003).

The increasing visibility of brownfield redevelopments and the need for

implementation of stakeholder participatory decision-making has occurred in recent years

for a number of reason. Brownfields represents a loss in property value, property tax,

city resources, and business revenue (De Sousa *et al*., 2009; Adams *et al*., 2010; Davis

and Sherman, 2010). Brownfields are often located in prime urban core areas, part of

limited downtown space and often is the last available downtown land for development

(BenDor *et al*., 2011). Brownfields are seen as a land management and viable smart growth options, an alternative to combat urban sprawl, and an option to developing green space (Bartsch, 2003; Adams *et al*., 2010; De Sousa, 2017).

Brownfields are often found in urban areas where marginalized and low income residents reside who are traditionally left out of the planning process (Eisen, 1998; Bullard and Johnson, 2000; Maantay and Maroko, 2018; Fowlkes, 2019). Though brownfields affect all major cities in the U.S. and are deemed a universal problem, research reveals the social aspects of this problem as minority communities bore a greater number of brownfields (Eisen, 1998; Bullard and Johnson, 2000; Maantay and Maroko, 2018; Fowlkes, 2019). One of the claims about brownfield redevelopment is that it can address environmental inequality by bringing about environmental justice (Maantay and Maroko, 2018; Fowlkes, 2019). Environmental inequality is the concept of a community having a disproportionate share of negative environmental burdens without a sufficient balance of compensatory benefits (Bullard and Johnson, 2000; Maantay and Maroko, 2018; Fowlkes, 2019). Many of the earlier studies focused narrowly on municipal or hazardous landfills as environmental burdens but has expanded (Bullard, 1994, 2000; U.S. EPA, 2017b). As the field of environmental justice (EJ) developed, the list of environmental burdens ranges from brownfields to Toxic Release Inventory data and prisons (Bullard, 1994, 2000; Maantay and Maroko, 2018; U.S. EPA 2018; Fowlkes, 2019). Researchers also consider brownfields to be an environmental burden that can be revitalized into a public benefit (Zimmerman, 1994; Greenberg and Cidon, 1997; Greenberg and Lowrie, 1999; Lange and McNeil, 2004; Paull, 2008; De Sousa and D'Souza, 2013; Favors, 2018; Nolan, 2018; Fowlkes, 2019; U.S. EPA, 2019).

Literature also points to the link between brownfield policies and environmental justice (EJ) as communities where the brownfields exist may not benefit from the redevelopment as others outside the community, e.g., developers and investors (Eisen, 1998; Bullard and Johnson, 2000; Maantay and Maroko, 2018). Gentrification, lack of benefits for local residents or the public, and undesirable new land uses are unintended consequence of brownfield redevelopments (Rast, 2006; Maantay and Maroko, 2018). These societal and EJ aspects are outside the scope of this work but can play a key role in the participatory activities that could led to successful brownfield redevelopment outcomes (Eisen, 1998; Bullard and Johnson, 2000; Solitare, 2005).

Despite traction in the brownfield arena, limited literature exists on how to best evaluate and incorporate meaningful participatory activities in brownfield redevelopments. Legislation such as the Brownfield Redevelopment Act (2002) mandates participatory efforts and encourages involvement by all stakeholders. Though thousands of brownfields have been redeveloped, the question of how to incorporate meaningful participation equitable to all stakeholders in brownfield redevelopment decision-making still remains (Solitare, 2005; Paull, 2008; Maantay and Maroko, 2018; Fowlkes, 2019).

Overall, public participation in brownfield redevelopment has advantages that are affirmed by literature (Duram and Brown, 1999; Creighton, 2005; Solitare, 2005; Forester, 2006; Gallagher and Jackson, 2008; Reed, 2008). Benefits of participatory activities include knowledge of local area, increased acceptance of decisions, enhanced democracy, better informed decisions, and more desirable project outcomes (Mostert, 2003; Solitare, 2005; Gallagher and Jackson, 2008). Participatory processes can generate increased levels of trust, understanding and information, build social capital, and increase

ownership (Brody *et al*., 2003; Burby, 2003). Public stakeholders are a wealth of information that could contribute to quality decisions that satisfy interests on a broader level (Beierle, 1999). Public participation is important to understand vital local context such as area characteristics, relationship, history, cultural, circumstances, and events which can led to successful project outcomes (Corburn, 2003; Solitare, 2005). Therefore, meaningful participation throughout and early in the project decision-making process is paramount for positive outcomes (Bartsch, 2003; Brody *et al*., 2003; Solitare, 2005).

Literature also states that participatory activities can contribute to project decision-making disadvantages. For instance, some problems could include increase in costs and time, inconsistent or unnecessarily rigorous decision-making, and unrepresentative and inadequate responses (Mostert, 2003; Reed, 2008; Luyet *et al*., 2012). Community needs may not be articulated accurately if poor quality input is provided (Arnstein, 1969). Additionally, Samuelson's *et al*. (2005) work suggests that if a brownfield redevelopment is viewed as enhancing the quality of life for a community, citizens are more likely to participate in participatory processes.

There is a need for public participation in brownfield decision-making, especially for those residents affected by the redevelopment (Bullard and Johnson, 2000; U.S. EPA, 2002; Solitare, 2005; Maantay and Maroko, 2018). However, there is limited research on ways to effectively implement meaningful participation or the analysis of participation policies performed on completed redevelopment projects (Solitare, 2005; Contreras, 2019). This research attempts to address a gap by offering ways of meaningful participatory efforts in the practice of brownfield redevelopment. To this end, the work

evaluates brownfield project participatory activities to discern effective stakeholder decision-making processes for best practices.

That said, this research relies on semi-structured questions which surveyed participatory efforts of each of the three categories of stakeholders, i.e., citizens, public officials, and developers. Based on these criteria, three brownfields are selected in Birmingham, Alabama's core downtown area. The sites' participatory elements were identified, its impacts analyzed, and best practices, which can be one of many factors that could led to successful outcomes, are suggested. The following chapter outlines the methodology employed to conduct a thorough review of Birmingham's public participation in brownfield redevelopment decision-making.

CHAPTER 3

RESEARCH METHODOLOGY

This chapter describes the methodology used to assess participatory activities in an effort to determine the extent public participation may have had influencing redevelopment outcomes. Research analysis was conducted based on the data collected and the following selection criteria which determined the redevelopments studied in this research.

Selection Criteria

The selected brownfield projects were based on the premise that they were instrumental in the revitalization of Birmingham's downtown core that began in the 2000s and continues today. The case study selection of Railroad Park, the Lyric Theatre, and Regions Field was based on several criteria listed below. However, details of each redevelopment will not be discussed here as Chapter 4 'Brownfield Redevelopments: Birmingham, Alabama' provides project data. Case study criteria were as follows.

- Participatory techniques with stakeholders occurred in the redevelopment;
- Site redevelopment was completed in the City's downtown core;
- Project appealed to the public's needs;
- Project generated direct and indirect new business and new residents to the area, i.e., snowballing effect; and
- Projects' ability to advance the renaissance focus of the City's Master Plan, i.e., project termed as pivotal for the revitalization of the city of Birmingham's downtown core.

The criteria were guided by the technical literature on the redevelopments and responses from the stakeholders' survey (Appendix A). Survey responses were based on stakeholder perceptions of participatory elements, impacts, and outcomes of the redevelopments.

Overview: Brownfields and Participatory Processes

Brownfield redevelopment initiatives have steadily increased along with process improvements (Davis and Sherman, 2010; U.S. EPA 2015, 2017a, 2019). Meaningful citizen participation has not kept this pace (Solitare, 2005). Participation may enhance the possibilities for improvement in environmental project decision-making processes. Typically, past studies approached participation based on general or broad parameters. For example, assessment approaches include the use of dichotomous variables for which participants indicate whether or not participation occurs (Isham and Kahkonen, 2002) or the use of a broad spectrum of participatory questions, e.g., participation is ranked by participants' experience on a numeric scale (Narayan, 1995). Participation has also been measured in various ways in economic and development fields where analysis mainly focused on potential causal links between project outcome and participation (Narayan, 1995; Khwaja, 2004; Marks and Davis, 2012; Burger *et al*., 2015). However, limited research has been performed on understanding how the extent of public participation in project decision-making may hinder or promote brownfield redevelopment.

This research explores whether or not stakeholders have different perspectives of the decision-making process for brownfield redevelopments. Analysis was performed to determine stakeholders' perspectives of what they consider successful redevelopment

outcomes. To operationalize the research tasks, Arnstein's (1969) ladder of participation was employed as an evaluative framework. The ultimate aim of the research is to investigate how citizen participation decision-making played a role in three local brownfield redevelopments in Birmingham, Alabama.

The research begins with a description and justification of the need for citizen participation in the brownfield redevelopment decision-making process. It concludes by employing mixed methods methodology on collected data and performing descriptive analyses of qualitative and quantitative data.

Qualitative case study methodology is used to evaluate Birmingham, Alabama's brownfield redevelopment participatory techniques (i.e., the role of public participation), stakeholders' perceptions of the redevelopment, and project outcomes. Research has documented benefits of qualitative data such its holism, ability to reveal intricacies, and richness (Miles *et al*., 2020). Qualitative data are also viewed as a basis of social processes that could preserve sequential flow to derive credible explanations for interrelationships and outcomes (Miles *et al.*, 2020).

Furthermore, based on defined criteria, three brownfield projects were selected to serve as the context for the research case study. The cases were assessed utilizing Arnstein's (1969) ladder of participation as an evaluative framework of stakeholders' perspectives and targeted participatory indicators of the brownfield redevelopment.

Content analysis of primary data were evaluated from semi-structured interviews and surveys (see Appendix A). Purposeful (convenience) sampling data were collected from stakeholders that were involved with the brownfield redevelopment projects in the city of Birmingham, Alabama. Use of secondary data sources provided a more

comprehensive evaluation of participatory activities employed in Birmingham's brownfield redevelopments which included a review of the technical literature, historical meeting records, newspaper articles, and the internet.

The following research questions are based on open issues that are not fully addressed in the literature.

Research Questions

- How well do participatory techniques facilitate public participation in brownfield redevelopment?

- Utilizing Arnstein's Ladder, are there significant differences in the perceptions of empowerment in the participatory process between stakeholders?

Purpose

The purpose of this research is to investigate how well actual public participation in brownfield redevelopment correspond to practices noted in research literature, and how perceptions of empowerment in the participatory process align with Arnstein's ladder of participation.

To that end, this research evaluates three Birmingham, Alabama brownfield redevelopments to determine if the redevelopment projects are aligned with the principles of meaningful public participation.

Goal

The overall goal of this research is to identify and quantify citizen decision-making in brownfield redevelopment projects through a comparative case study analysis of three pivotal redevelopments in Birmingham, Alabama's core downtown region. The accomplishment of the research questions, purpose, and goal was guided by the following research objectives.

- Determine if the brownfield redevelopment meets participatory criteria (*refer to the selection criteria provided previously*);

- Identify stakeholders' participatory activities and identify the measure of participation;

- Analyze the extent of perceptions of empowerment in the participatory process between stakeholders; and,

- Evaluate the extent participatory elements may have had influencing redevelopment outcomes.

Research Limitation

While this research unveiled effectiveness, strengths and weaknesses of perceived participatory practices in Birmingham, Alabama, it cannot be assumed that all cities encounter these outcomes. This work is based upon three pivotal brownfield redevelopments and stakeholder feedback regarding these projects.

Research Model

As the city of Birmingham continued to decline due to the exodus of businesses and residents which contributed to the loss in tax revenues and distressed properties, the City scrambled to implement projects that would infuse the revitalization of the its downtown core, from the 1970s – 2000s.

That said, Birmingham implemented a Master Plan to redevelop distressed properties, of which participatory elements were crucial, early in the project process (Bartsch, 2003; Callahan, 2007; Cornwall, 2008; U.S. EPA, 2015; Kemp-Rotan, 2019; Schoonover *et al*., 2019). Although not representative of all the types of participatory activities and the array of components in a redevelopment project, Arnstein's framework

has been shown to be adaptable for application of environmental projects (Arnstein, 1969; Contreras, 2019). In this manner, Arnstein's participatory measurements was utilized as an indicator tool for assessment of participatory practices. Based on previous literature and stakeholder input, key central environmental project participatory areas were revealed to be: planning/community needs and concerns input, project design, and desired redevelopment outcome (Bartsch, 2003; Callahan, 2007; Cornwall, 2008; U.S. EPA, 2015; Kemp-Rotan, 2019; Schoonover *et al.*, 2019). These key participatory areas along with other phases of the redevelopment utilized the following five step model to assess the three local brownfield redevelopments in Birmingham, Alabama.

The description of the five levels for the framework utilized to assess public participation for the case studies of this research is summarized as follows.

1. **'No Public Involvement'** – This level represents non-participative citizen involvement. The aim is to educate the participants. Through participatory activities, the goal is to achieve public support. Unfortunately, this level of public participation occurs often and is commonly experienced by communities.

2. **'Public Receives Information'** – Proposed project information is provided to the public. Generally, this step is considered an important aspect of legitimate participatory efforts. Often, the emphasis is on the dissemination of information one-way, non-dialogical and activity become a mere feedback channel and defeats the purpose of genuine participation.

3. **'Public Provides Feedback'** – This is a vital level or step in the participation model as information sharing not only occurs but citizens become involved in the process. Stakeholders have a vested sense of obligation to demonstrate public engagement. Often this level involves selected 'passive, safe participants' that easily adhere to processes provided by the power holders. This step is commonly seen as being performed for the appearance of participatory activities and lack process depth.

4. **'Public Decision-making Involvement'** – On this level, negotiations between citizens and power holders occur and redistribution of power transpire. Clear, transparent dialogue ensues and a commitment occurs to involve participants in planning and decision-making processes. Active citizens are delegated decision-

making power where stakeholders have given much time and effort to engage the public who assure project accountability.

5 **'Public-Initiated Involvement/Task' –** This step of the ladder is a degree of power where participants have control of policy, decision-making activities. Citizens negotiate aspects of the project and negotiate conditions of the project with power stakeholders. (Arnstein, 1969; Contreras, 2019)

This 5-level model aligns with Arnstein's ladder of 8 degrees of participation. The five levels for this study correspond to Arnstein's ladder framework as follows (Table 7). Note, details of Arnstein's framework was discussed in the literature review section.

Table 7: Public Participation Levels: Research Model vs. Arnstein's Ladder (1969)

Level	**Research Model**	**Arnstein's (1969) Ladder**
1	1- no public involvement	1- manipulation and rung 2- therapy
2	2- public receives information	3- information
3	3- public provides feedback	4- consultation and rung 5- placation
4	4- public decision-making involvement	6- partnership and rung 7- delegation
5	5- public initiate task	8- citizen control

As in the case of this study and Arnstein's (1969) research, public participation can be categorized in term of citizen power. Arnstein (1969) defined this as the redistribution of power that enables those excluded from economic and public processes, e.g., the "have-not" citizens, an opportunity to deliberately be involved in future processes. Public participation in these processes allow the public to be part of determining how information is shared, policies are established, goals are set, and other activities that affect their quality of life and enable affected citizens the benefits of the affluent society (Arnstein, 1969). Arnstein's ladder was used as a framework to evaluate participatory elements of Birmingham's redevelopments based on responses from the

semi-structured surveys (Appendix A). The following procedures guided the study's evaluative process.

Procedure Overview

This research explores the participatory decision-making process, to explore whether or not brownfield redevelopment stakeholders felt empowered in the participatory process. Stakeholder perspectives of participatory practices of the decision-making process for the three redevelopments were analyzed. To operationalize these tasks, Arnstein's ladder of participation was employed as an evaluative framework. Ultimately, this research aimed to investigate how citizen participation decision-making played a role in Birmingham, Alabama's brownfield redevelopment.

The following tasks guided the research:
- the research documents stakeholders' participatory activities and measure of participation,
- the research investigates stakeholders' perceptions of participatory decision-making activities,
- the influence that participatory elements may have had on redevelopment outcomes were evaluated, and
- the perceptions of empowerment in the participatory process between stakeholders were compared.

Based on these tasks and the technical literature, the stakeholders' semi-structured interview and survey instrument was developed to generate data that addressed the research objectives (Lange, 2001; Solitare, 2005; Simon, 2013; Contreras, 2019).

Data Collection Methodology Overview

Stakeholder data resulted from purposeful (convenience) sampling of public records, review of literature on the redevelopments, news articles, neighborhood meetings, and the snowball effect. Research data were also obtained from semi-structured

interview and survey questions (Appendix A) which was performed in an organized manner. Survey open-ended and closed ended questions underwent content analysis whereas Likert scale responses underwent pattern analysis. Likert scales are rating scales which are used to measure participant opinions and attitudes (Leedy and Ormrod, 2016). For the survey and interview questions, Likert's 5-point scales are used which are viewed as one of the most reliable scales (Miles *et al*., 2020).

Data from the Likert scale responses were coded and uploaded into a comprehensive statistical software package called SPSS (Statistical Product and Service Solutions) version 25. Coding is a technique used to analyze qualitative data and Appendix C contains Excel and SPSS output along with the code guide for the research. SPSS, an integrated statistical package created in 1968 by SPSS, Inc., and bought by IBM in 2009, was utilized to analysis stakeholders' participatory elements (Saldana, 2016; SPSS, 2019). Additionally, Excel's Analysis ToolPak was uploaded into the Data Analysis tab in order to perform statistical analysis. The research analyses included descriptive statistics and hypothesis testing (t-tests and Wilcoxon tests).

Specifically, survey responses rating the level of public participation in project decision-making were provided by stakeholders, coded, and uploaded into Excel and SPSS. This addresses the research question which evaluates if there are significant differences in the perceptions of empowerment in the participatory process between the various stakeholders. Analysis consisted of hypothesis testing where the null hypothesis (H_0) states that stakeholder perceptions are the same about participatory elements that occurred in Birmingham, Alabama's redevelopment process, whereas, the alternative hypothesis (H_1) states that the stakeholder perceptions are not the same about

participatory elements in the redevelopment process. Two-tailed t-tests and Wilcoxon tests were utilized to establish the significance of perceived participation processes at alpha level (α) = 0.05.

The research analysis is based on responses from the semi-structured interviews and surveys. For qualitative research, there is no established guideline for the ideal number of interviews or sample size for data analysis as it can be dependent on a number of factors such as the researchers' objective, saturation, setting, or event (Marshall, 1996; Galvin, 2015, Creswell and Creswell, 2018). Though, Creswell and Creswell's (2018) phenomenology study recommend a range from 3-10; narrative interviews one or two individuals; and case studies about three to five. Consequently, a total of 21 surveys provided data for the research -- 11 surveys were received from residents/citizens, 5 from public officials, and 5 from developers/owners (see Appendix D). Results of the analysis are outlined in Chapter 5 (Results) and Appendix C which contains the Excel and SPSS outputs.

Data obtained from open-ended questions and secondary data were analyzed, themes identified, and findings are illustrated in tabular matrixes created in Microsoft Office 16 Word and Excel. Charts also provided visual representation of survey results. Tables were organized in accordance with each research question/objective and stakeholder category.

Additionally, semi-structured interview and survey questions (Appendix A) were answered for each of the three categories of stakeholders – citizens, public officials, and developers. The survey was organized into four sections/themes (i.e., project, participation, impacts, and outcomes, Appendix A) which served as the foundation for

analyzing environmental project participatory decision-making and outcomes. Secondary

data sources, i.e., review of the technical literature, meeting notes, articles, and the

internet, aided in defining the survey's section/theme and stakeholder questions.

Following is a discussion of the survey design. However, Chapters 5 and 6 (Results

/Summary and Conclusions) address the details of the survey and interview responses

with the appropriate summaries and conclusions.

Survey Design

The literature and discussions with stakeholders guided the survey design. Three

semi-structured surveys (Appendix A) were designed for each of the stakeholder

categories. The surveys (Appendix A) contained similar questions which was

instrumental for comparison purposes. The questions sought factual perspectives,

opinions, and information from stakeholders involved with participatory elements of the

project (Stake, 2010; Saldana, 2011).

Utilizing planning literature concepts and Arnstein's ladder of participatory

elements, the data collection instrument was developed to include a series of descriptive,

open-ended, closed-ended, and scaled questions. For validity of the collection instrument,

an initial and revised version of the instrument was given to 14 colleagues which resulted

in three survey reiterations. Survey design occurred from June 2019 through December

2019.

Semi-structured interviews and survey responses provided the study's primary

data. The collection instrument was administered to three stakeholder categories – the

public/citizens, public officials, and developers that were involved with one of the study's

three brownfield redevelopments. The survey (Appendix A) evaluates brownfield

redevelopment participatory activities based upon the preceding criteria taken from environmental, planning, and urban redevelopment literature.

The survey (Appendix A) was systematically designed to answer each research inquiry and meet objectives. The participants were provided the option of taking the survey by distribution at neighborhood meetings, phone, or email. The majority of stakeholders opted to address questions by phone which was given in a semi-structured fashion. Thus, stakeholders were contacted from August 2019 through February 2020. Stakeholder interviews ranged from twenty-five minutes to forty-five minutes.

Moreover, responses from the majority of citizen/residents stakeholders occurred during neighborhood meetings, of which, seven of the eight neighborhoods had a meeting during the timeframe October 2019 through February 2020. With the use of each neighborhoods' listserv, residents were also emailed a flyer (see Appendix E) that solicited public input about their experience(s) with any of the three selected brownfield redevelopments. Tables summarizing key stakeholders' questions and their responses is provided in Chapter 5 (Results).

To that end, the design of specific survey questions was linked to the corresponding research questions and objectives as follows.

Research Question: How well do participatory techniques facilitate public participation in brownfield redevelopment?

Research Objectives:
- Identify stakeholders' participatory process and activity

- Determine the measure of stakeholder participation

Approach: Based on the research problem, the following semi-structured research questions were developed to measure public participation in the brownfield redevelopment decision-making process. Likert scale response questions were analyzed using Excel while descriptive response questions were tabulated with the use of SPSS.

Survey Questions
- What part of the redevelopment were you involved with?

- During the redevelopment for which you were part of, did you have an opportunity to observe public participation? If so,
    o Describe the type(s) of participation.
    o How would you rate your level of participation during the above event(s)? (scale: 1-5) *

Level of Participation (scale 1-5) *
1: no public involvement
2: public receives information
3: public provides feedback
4: public involved in decision-making
5: public initiated

Research Question: Utilizing Arnstein's Ladder, are there significant differences in the perceptions of empowerment in the participatory process between stakeholders?

Research Objectives:
- Investigate stakeholders' perceptions of participatory decision-making activities;

- Assess the extent participatory elements may have had influencing redevelopment outcomes; and

- Compare the perceptions of empowerment in the participatory process between stakeholders.

Approach:
The following questions were developed to assess, measure, and compare participatory elements and perceptions of empowerment implemented in the redevelopments. Once the research questions were answered, the final 'empowerment perception' objective was met. Details of stakeholder perceptions are addressed in Chapter 5 (Research Results).

Survey Questions

- During the redevelopment for which you were part of, did you have an opportunity to observe public participation? If so,
    - Who initiated the public participation?
    - Describe the type(s) of participation (*Q2*)
    - How would you rate your level of participation during the above event(s)? (scale: 1-5) *
    - How do you rate public participants' involvement in the following areas during the redevelopment? (scale: 1-5) *
        - Participation event(s) described by *Q2* above
        - Express concerns and needs of the area
        - Project design input
        - Express desired redevelopment outcome
        - Project implementation
    - Did or how did public participation change through the course of the redevelopment?

- Is there anything that could have been done to improve the participatory process?

- Do you think there were elements that aided the redevelopment?

- Do you think there were elements that hindered the redevelopment?

- How would you evaluate the outcome of the redevelopment? (scale: 1-5) **

- To what extent are you satisfied with the outcome? (scale: 1-5) ***

LEGEND

Level of Participation (scale 1 – 5) *
1: no public involvement
2: public receives information
3: public provides feedback
4: public involved in decision making
5: public initiated

Level of Success (scale 1 – 5) **
1: not successful
2: somewhat unsuccessful
3: somewhat successful
4: successful
5: very successful

Level of Satisfaction (scale 1 – 5) ***
1: not satisfied
2: somewhat dissatisfied
3: somewhat satisfied
4: satisfied
5: very satisfied

Appendix A contains the stakeholder surveys. Appendix C has the Excel and SPSS output to the coded scaled questions and responses. Chapter 5 has details of the survey responses.

Citizen participation is a major tenet in the environmental project decision-making process as this fact is affirmed by the technical literature (Beierle and Konisk, 2000; Lange, 2001; Beierle and Cayford, 2002; Lange and McNeil, 2004; Laurian and Shaw, 2009; Luyet *et al.*, 2012; Maantay and Maroko, 2018). However, limited work exists on how to best evaluate and incorporate participatory activities in brownfield redevelopments. The U.S. EPA (2002) revised public participation guidelines to reaffirm their commitment to meaningful and early public participation as a positive aspect of project redevelopment. Public participation decision-making is paramount in brownfield redevelopments as participatory efforts could assist with addressing area needs, process improvements, cultural sensitivity, and problems with techniques (Innes and Booher, 2004).

The research is important and timely as the number of brownfields are expected to increase (Paull, 2008). Dissatisfaction has been expressed with brownfield redevelopment not addressing community needs and creating unanticipated consequences such as gentrification (Solitare, 2005; Maantay and Maroko, 2018). This fact gives more credence for understanding how to effectively incorporate meaningful participatory activities that result in equitable outcomes for all stakeholders, especially those most affected by the brownfield redevelopment (Solitare, 2005). This chapter describes the methodology used to assess participatory elements in an effort to determine the extent public participation may have had an influence on redevelopment outcomes. Primary and

secondary data were collected to support the research analysis and results could assist with developing brownfield best practices and aid in policy development. Based on defined criteria, three brownfield redevelopments were selected in Birmingham, Alabama's core downtown area of which, participatory elements were identified, its impacts analyzed, and best practices which may lead to successful project outcomes are suggested. The following chapter outlines Birmingham's unique historical, economic, cultural, and political environment and defines the three pivotal brownfield redevelopments that were instrumental to the city's urban core revitalization.

CHAPTER 4

BROWNFIELD REDEVELOPMENTS: BIRMINGHAM, ALABAMA

Overview

Based on the technical literature and established criteria, three brownfield redevelopments were selected to perform the research's case study analysis. The redevelopments are considered a pivotal part of Birmingham, Alabama's downtown revitalization. Railroad Park, the Lyric Theatre, and Regions Field were found to be key catalysts for Birmingham's downtown cultural and civic development (Gose, 2013; Billmeier, 2019; Kemp-Rotan, 2019; RPCGB, 2019). These redevelopments not only created a vital and vibrant city center, they were seen as successful redevelopments which connected the public with the history of Birmingham. For example, the Railroad Park project showcases the City's steel industry along the rail system and connects the public with this historic aspect of Birmingham, Alabama's past.

Moreover, the research explores whether or not the decision-making process, in particular public participation, matters in achieving successful redevelopment outcome. In this manner, the research attempts to understand what different stakeholders, including public officials, developers, and neighborhood residents, think about the selected brownfield redevelopments and perform a comparison of stakeholder perceptions. The research explores why what one group of stakeholders may see as a problem and its

solution differ from another groups' perception. Each stakeholder views the impact of participation from their particular vantage point.

Participation, as suggested by Healy (1996), basing the decision-making upon the idea of communicative planning should be meaningful and strong. This is inclusive of the collaborative process which is one that entails decisions being made by all stakeholders, e.g., experts and the public/residents (Fiorino, 1990; Fischer, 1993; Renn *et al*., 1995). This collaborative concept is part of the investigative framework for Birmingham's redevelopment.

The city of Birmingham, Alabama, formed in 1871, received its name from an industrial city in Birmingham, England. This name was fitting as Birmingham was famous for its coal, limestone, and iron ore (U.S. History, 2018). These ingredients are the central elements for producing steel. This is how Birmingham became known as the 'Steel' City of the South. Birmingham was also known as the 'Magic City' as it described the rapid booming city (U.S. History, 2018).

However, like many other industrial cities, Birmingham experienced challenges when the Great Depression occurred. The City bounced back from this decline as World War II demanded the need for steel, then post industrialization followed and many plants closed (U.S. History, 2018). Once the industries began to downsize, shut down, or relocate to the suburbs, the city of Birmingham incurred major revenue losses in addition to job losses (Bhamwiki, 2017; Billmeier, 2019). This was the beginning of the flight of many companies to flee the City, abandoning or under-utilizing buildings which began the grounds for the creation of brownfields (Hansen, 2011; U.S. History, 2018).

As the City became more dilapidated, crime increased and residents moved away from the City (Hansen, 2011; U.S. History, 2018). The trend of declining city living began to diminish as the downtown areas of Birmingham were redeveloped. Brownfield development became an integral part of the economic development and revitalization of the city of Birmingham, Alabama. In 1995, Birmingham, Alabama was one of the first City's to apply for brownfield redevelopment funding and was one of the charter pilot programs (Favors, 2018; Nolan, 2018).

In the late 1990s and early 2000s, several redevelopment projects began. One of the first projects to be awarded a brownfield redevelopment fund was the Lyric Theatre. This was followed by a major brownfield redevelopment known as Railroad Park. Regions Field was also a redeveloped brownfield credited with revitalizing and spurring economic growth in the downtown Birmingham (U.S. Census, 2019; World Population Review, 2019). Moreover, 2018 U.S. Census (2019) population estimates indicated that 209,880 people lived in Birmingham and 1.15 million were in the Birmingham-Hoover Metropolitan Area. For Birmingham, this include a total of 168,942 adult residents (18 years or older) and 30, 171 seniors. Furthermore, 70.5% of residents were black and 25.3% were white with a median household income of $25,346 (U.S. Census, 2019; World Population Review, 2019).

Details of Birmingham's urban core area and the three crucial brownfield redevelopments are as follows.

The City of Birmingham's Urban Core

The Regional Planning Commission of Greater Birmingham (RPCGB) and the city of Birmingham designated Birmingham's downtown urban core as consisting of eight neighborhoods of the total of ninety-nine Birmingham neighborhoods (RPCGB, 2019).

Figure 3 illustrates Birmingham's urban core region which is designated by the boundary of the City's Master Plan. The Northside Southside region includes: Central City, Druid Hills, Evergreen, Five Points South, Fountain Heights, Glen Iris, Norwood, and Southside neighborhoods (RPCGB, 2019). Unlike most downtown areas typically of one square mile, the Metropolitan area of the city of Birmingham is four square miles with the urban core being approximately one square mile (RPCGB, 2019).
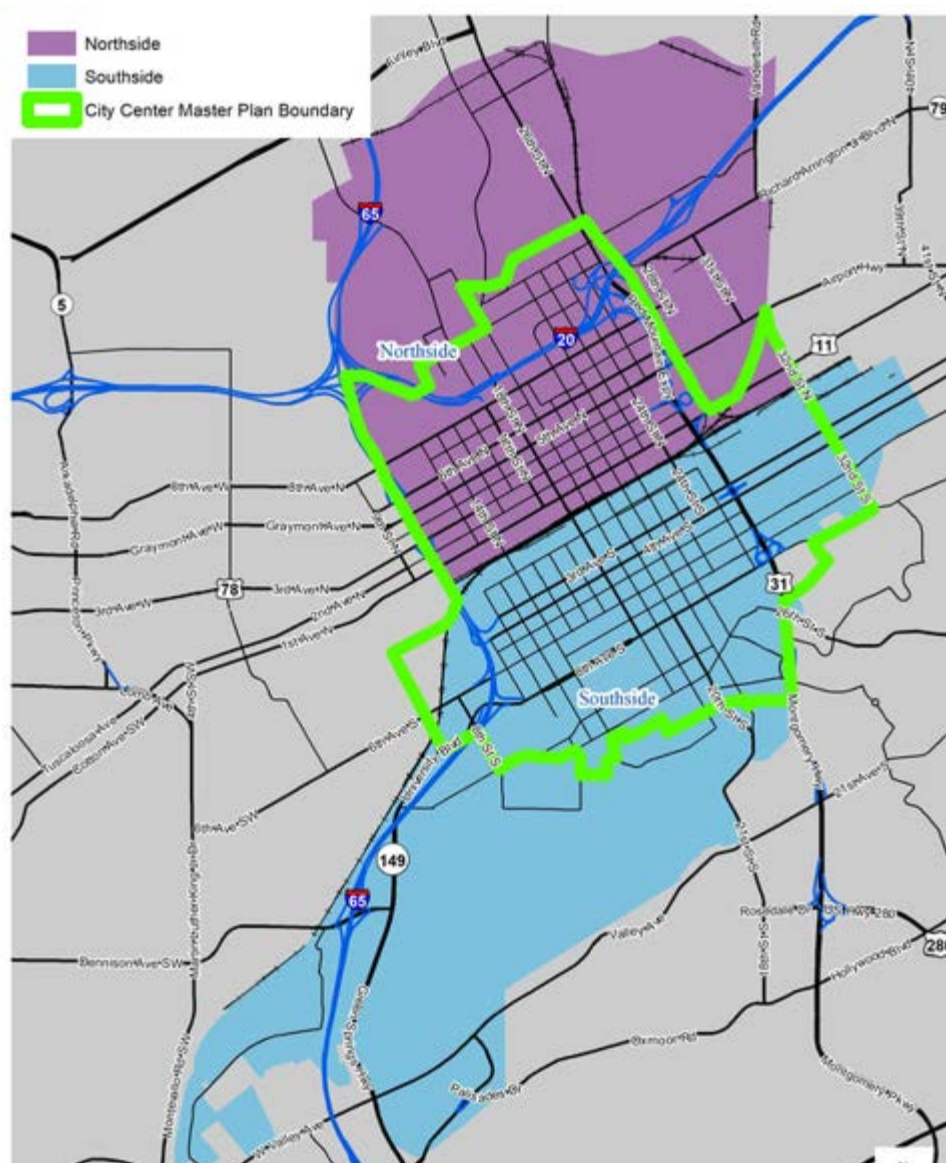
Figure 3: Outline of Birmingham, Alabama's Urban Core
Source: Regional Planning Commission of Greater Birmingham Plan (RPCGB, 2019)

Figure 4 shows the eight neighborhoods that makeup Birmingham's urban core and displays the locations of the three redeveloped brownfield sites for the research case study.
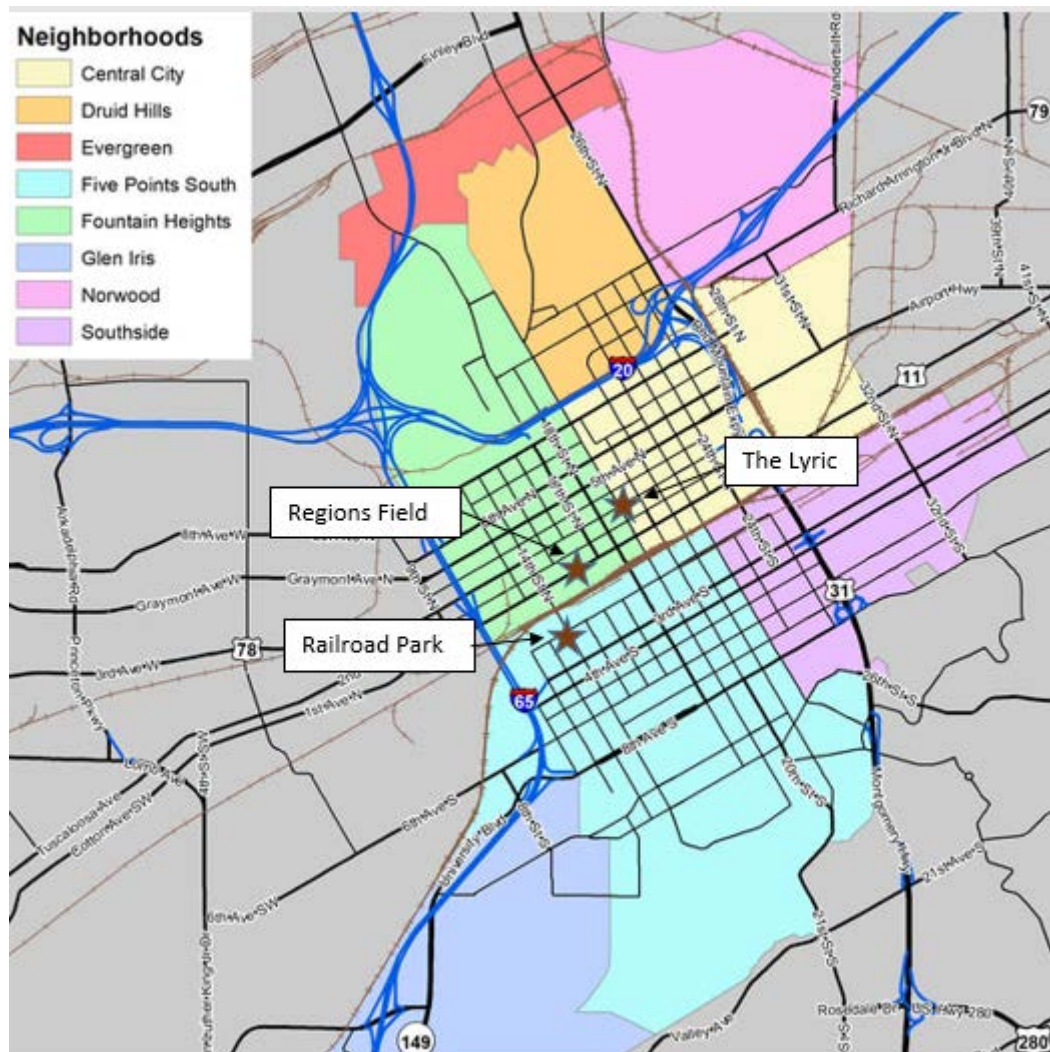
Figure 4: Illustration of Birmingham's Urban Core Neighborhoods (RPCGB, 2019)

In 2018, this region had a population of 33,260 (RPCGB, 2019). For surveying of this region, attendance at community meetings and personal contacts were made with each of the eight neighborhoods. These correspondences provided primary citizen stakeholder data for the research.

Detailed characteristics of the three selected brownfield redevelopments are discussed as follows.

Railroad Park

In 2010, formerly abandoned urban factories, commercial businesses, and dilapidated rail lines became the home of the 19-acre Railroad Park. This downtown greenspace magnet was a major catalyst for reviving the City of Birmingham (West, 2015). Figures 5 and 6 are illustrations of the former brownfields and the parcels current land use.

Figure 5: Railroad Park previous landscape
Source: landscapeperformance.org

Figure 6: Railroad Park (Bhamwiki, 2017b)

As part of the city of Birmingham's redevelopment plan, the once brownfield was now transformed into a community greenspace. Through public and private partnerships, funds exceeding $22.5 million were raised from investors and the state, local and federal government (West, 2015). The once vacant buildings, lots, and abandoned factories and warehouses became home to streams, bio-filtration wetlands, ponds, hundreds of trees, open grassy areas, diverse landscaping, and event venues (Railroad Park Birmingham, 2018). Railroad Park reinvigorated the downtown area. The Park spurred investment and development of downtown Birmingham which has also encouraged citizens to move back into the City (West, 2015).

Many multi-million dollar developments such as Stockyard and Railroad Square have generated not only jobs but added to the city tax base and increased property value (West, 2015). Railroad Park was credited with changing perceptions of the Magic City. This fact was supported by a survey conducted by the *Birmingham Business Journal* which stated that Railroad Park topped their reasons for loving the City (West 2015).

Railroad Park has created a sense of safety for the downtown area and spurred economic growth. The City has experienced the development of apartments, multi-family housing, bars, restaurants, and retailers such as Publix Super Market.

With the use of government and private funds, Railroad Park exemplifies an excellent private-public partnership. The development of Railroad Park totaled of $22.5 million dollars for which, $17.5 million was donated from public funds. The Federal Highway Administration's Congestion Mitigation and Air Quality Improvement Program contributed $2.5 million dollars. The city of Birmingham initially contributed $7.5 million which was increased by $5 million through funds from the Birmingham Economic and Community Revitalization Ordinance; and lastly, Jefferson County donated $2.5 million dollars (Rotan, 2015). All the public agencies came together with investors and developed this successful community destination venue - Railroad Park, which has and continues to reflect positively on the City's downtown. As illustrated in the following timeline summary (Figure 7), Railroad Park won the 'Urban Open Space Award' in 2012 for its design, solidifying the Parks' important impact on the revitalization of Birmingham's downtown urban core (Bhamwiki, 2017b, Leader, 2020).
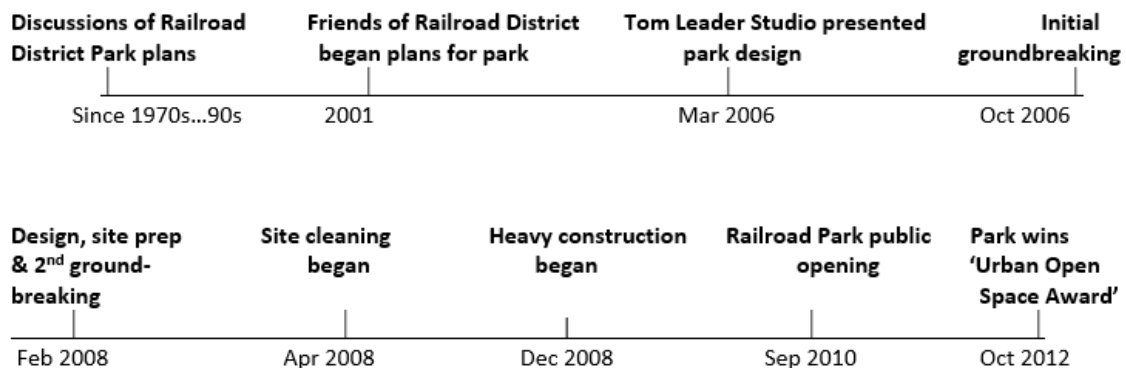

Figure 7: Timeline of Railroad Park Redevelopment (Bhamwiki, 2017b)

Lyric Theatre

The Lyric Theatre is a historic landmark, a classical vaudeville house, opened in 1914 and closed in the early 1970s (Huebner, 2012). The once finest art performing theater in the City was closed in the 1970s and after years of neglect, the Birmingham Landmarks, Inc. purchased it in 1991 (Birmingham 365, 2018). The restoration of the Lyric Theatre was part of the City's targeted brownfields and in 2010, the theater was awarded an EPA assessment grant via a brownfield historic preservation grant. The assessment grant was awarded to remediate asbestos and lead paint (Nolan, 2018). A large fundraising campaign began to restore the theater. Funds were acquired from investors, the government, and nonprofits. The community also engaged in crowd-funding and volunteers helped with this effort (Nolan, 2018). The cost of renovating the theater was estimated to exceed $11.5 million (Colurso, 2016). The Lyric was seen as one of the catalysts for revitalizing downtown Birmingham. The renovation of the Lyric Theatre increased property values, the tax base, and also attracted more businesses to the downtown area (Nolan, 2018).

Overall, the goal was to have the Lyric renovated and opened for its centennial, January 14, 2014 (Huebner, 2012). It was estimated that the theater could generate more than $5 million in revenue per year (Huebner, 2012). As of March 2018, ticket sales were $7 million in revenue (BizJournals.com, 2018). Through fundraising, donations, and volunteer labor, the Lyric Theatre re-opened on January 24, 2016, its 102th anniversary (Bhamwiki, 2017a). Through key partnerships, community support, and the City's revitalization plans, the Lyric Theatre restoration has helped inject life back into the

downtown area. Below is a summary of the timeline of the Lyric's redevelopment (Figure 8).
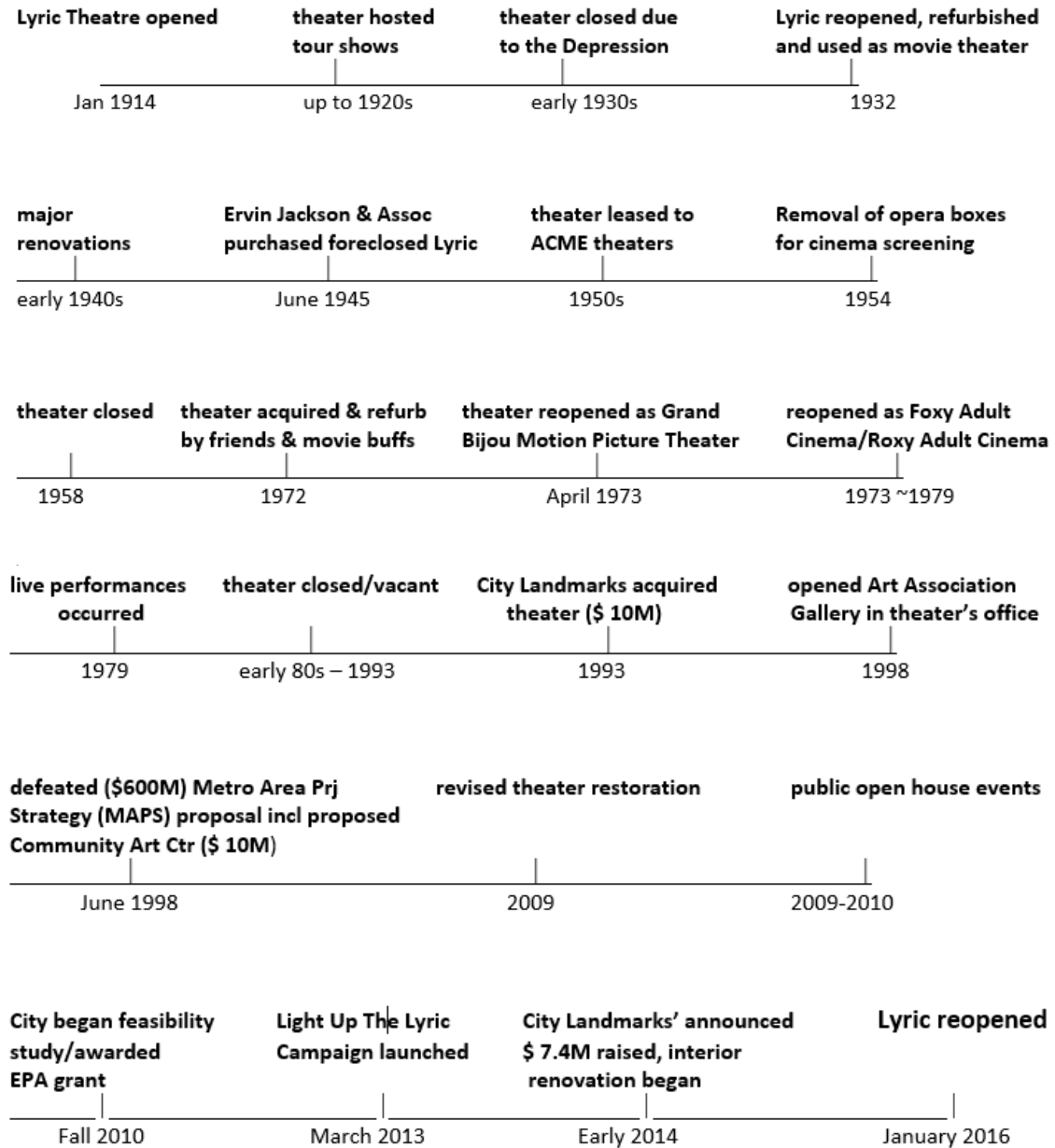
Figure 8: The Lyric's timeline redevelopment (Bhamwiki, 2017a)

As shown below, renovation of the main theater room, which will seat 750 people, began in 2014 (bhamwiki, 2017a). Figure 9 is an illustration of the dilapidated state of the Lyric Theatre's main room.

Figure 9: Dilapilated state of the Lyric's interior
Source: https://lyricbham.com/

Figures 10 and 11 shows the current renovated facility that now hosts the

overflow from the Alabama Theatre and other venues.

Figure 10: Lyric Theatre interior renovation
Source: https://lyricbham.com/

Figure 11: The Lyric's renovated façade (Bhamwiki, 2017a)

Regions Field

In the 1900s, a chemical storage, coal yard, manufacturing facilities, and auto repair shop occupied four blocks of downtown Birmingham (Figure 12). This area (Figure 13) was transformed into Regions Field (Bullock Environment, 2010). This state-of-the-art sports facility was completed in 2013 and in 2015, Regions Field was named the Ballpark of the Year (Ballpark Digest, 2015).

Figure 12: Regions Field pre-construction (Barons Marketing Department, 2020)

Figure 13: Regions Field (Bhamwiki, 2017c)

The 8,500 seat stadium (Figure 14) has a skyline of Birmingham's landmarks

such as Red Mountain, Railroad Park, and Vulcan Park and is considered one of

Birmingham's premier destinations (Mock, 2017).

Figure 14: Park stadium view and surrounding area (Barons Marketing Department, 2020)

The City envisioned the sports park and a feasibility study revealed that in 30

years, the sports facility could generate more than $500 million dollars in indirect and

direct spending (Schoel, 2015). In addition, benefits were estimated to generate more

than 220 jobs, more than $150 million dollars, and tax revenues of more than $30 million

(City of Birmingham, 2016). Through public and private funds, the park began

assessment and remediation in 2011.

The process of environmental testing and remediation revealed the presence of

petroleum, organics, and underground storage tanks which were remediated (Bullock

Environmental, 2010). Supplementary funds of $750,000 was used to create a dewatering system and remove supplementary soil (Bullock Environmental, 2010). Cleanup of the Ballpark generated private investment which benefitted the City's tax base. Private developments such as office space, retail, and the $30 million LIV Parkside apartment complex followed (Gose, 2013). Other multimillion dollar developments included the Venue at the Ballpark apartments, the Westin Hotel, and L&N Parkside (Gose, 2013). Increases in sales for local businesses are also attributed to the benefits of the Regions Park development (Paepcke, 2015). By all accounts, the creation of Regions Park was pivotal for the revitalization of downtown Birmingham. On April 10, 2013, Regions Park opened to a sellout crowd and record attendance has occurred for many seasons (Bhamwiki, 2017c). Figure 15 is a summary of the Park's timeline.

Parks' feasibility & economic impact study	City funding plan approved for facility	Approval of finance for facility construction
2009	Oct 2010	Dec 2011

Groundbreaking For park	Design & site plan approval	Public open house to see stadium	Opening day for Regions Field	Named 'Ballpark of the Year'
Feb 2012	Mar 2012	Jan 2013	Apr 2013	2015

Figure 15**:** Regions Field redevelopment events (Bhamwiki, 2017c)

In 2021, Regions Field will host the World Games. More than 3,600 athletes in 34 multidisciplinary, unique sports will be providing Birmingham with an estimated economic impact of $256 million (RPCGB, 2019). Regions Field has been and will continue to be a very important destination location for establishing downtown traction and generating revenue.

Area Summary

As can be learned from these examples of industrial transformations, collaborative, strategic planning is often required over some time for a successful redevelopment outcome. Whether the project is initiated by the community, government, or developers, collaboration amongst all stakeholders to resolve problems can be a long-term venture. As such, projects that take dilapidated, long-underused property and change them into tax generating, public spaces or functional buildings, are long-term commitments and are not for the easily discouraged.

For Birmingham, Railroad Park along with Regions Field are major redevelopments deemed responsible for igniting the areas revitalization. These developments, including the Lyric Theatre, are catalysts for new businesses, restaurants, and apartment developments in Birmingham's downtown urban core. Due to the areas new found attractions, new apartments, and increased new residents, retailers such as Publix Super Market, the Marriott, and Home2 opened in downtown locations. In addition, a key benefit of Railroad Park was how the Park changed people's perception of the City (Billmeier, 2019). Safety was no longer a major concern as thousands of people from Birmingham's suburbs regularly visit the Lyric, Railroad Park, and Regions Field, among other new developments (Billmeier, 2019).

Billmeier (2019) suggested that one of the areas' most important changes was "the public's attitude toward downtown." The feeling is that Birmingham is back which was not the case ten years ago (Gose, 2013). Developments such as Railroad Park has contributed to increasing property values in the surrounding areas with some properties' having tripled in value (see Figure 16).
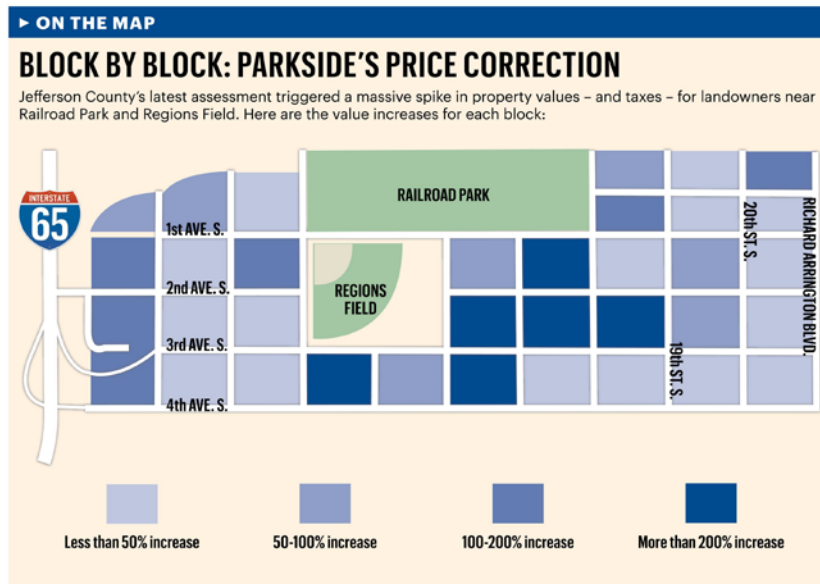
Figure 16: Property value change since Railroad Park and Regions Field redevelopments (West, 2015)

This increase in property values, by default means higher taxes, is also creating interest amongst developers who are purchasing the unoccupied properties. The public is also benefitting from these higher property values and making profits from the sale of their property. However, those who have lived in these areas for a while can view this as a negative consequence. They consider these areas as their home but can no longer afford to live in the area. Concerns of gentrification of neighborhoods such as Parkside, Avondale, and Crestwood have been expressed for which, the City's plans have taken this into account (Kemp-Rotan, 2019). Nonetheless, downtown residents have expressed feelings of being squeezed out of their homes with their taxes having more than doubled in one year (Davis, 2014). This is often an unfortunate consequence of redevelopment however, Birmingham has put measures in place to mitigate the impact of gentrification (Billmeier, 2019; Kemp-Rotan, 2019).

In summary, Birmingham is an ideal city to evaluate participatory elements of successful redevelopments. Such as, the trend of declining city living began turning around as the downtown areas of Birmingham were redeveloped (Billmeier, 2019). In the late 1990s and early 2000s, several redevelopment projects began (Morgan, 2019). One of the first projects to be awarded a brownfield redevelopment fund was the Lyric Theatre (Morgan, 2019). This was followed by the major brownfield redevelopment of Railroad Park. Lastly, Regions Field was also a redeveloped brownfield that is credited with revitalizing and spurring economic growth in the downtown Birmingham area. These elements provide the foundational framework for this research.

This research examines the various participatory processes used in Birmingham's major redevelopments; explores how various stakeholders were involved with the redevelopments; analyzes stakeholders' view of the citizen engagement process, and compares stakeholders' perceptions of participatory decision-making in the redevelopments. Research findings provide consideration for brownfield redevelopment policy and planning.

CHAPTER 5

RESEARCH RESULTS

The primary research goal was to identify and quantify citizen decision-making in brownfield redevelopment projects through a comparison case study analysis of three pivotal redevelopments in Birmingham, Alabama's core downtown region.

The achievement of the research questions, purpose, and goal was guided by the research objectives which are listed below:

1: Determine if the brownfield project meets participatory redevelopment criteria;

2: Identify stakeholders' participatory activities and measure of participation;

3: Analyze the extent of perceptions of empowerment in the participatory process between stakeholders; and,

4: Evaluate the influence that participatory elements could have had on the redevelopment outcome.

The following are summaries of research findings that address the research objectives and questions.

Table 8 provides a summary of the survey respondent data. Due to minimal stakeholder feedback, unless indicated, survey results are the combined responses from all three redevelopments.

Table 8: Survey Respondent Data

Survey/Interview Respondent	*# Received Surveys/Interviews*
Citizens, Residents, Community Advocates	11
U.S. EPA, City of Birmingham, Mayors Office	5
Developers, Owners, Executive Officer	5

*Research Objective***:** Determine if redevelopment meets defined participatory criteria

This objective was typically addressed at the beginning of each stakeholders' survey, e.g., questions 1-4 and questions 7-10 (see Appendix A). Specifically, these questions were addressed in the survey's 'Project' and 'Impacts' theme/section. Survey questions from the 'Project' theme solicited responses that identified redevelopments which occurred within Birmingham's urban core boundary. The 'Impacts' section questions asked stakeholders to classify their opinion of the redevelopments' impact on the City's revitalization. The semi-structured survey prompted responses included: pivotal; somewhat important; or inconsequential (Appendix A).

Table 9 is the summary of stakeholder responses to the selection criteria and redevelopment impact survey questions. Redevelopment impacts are also illustrated by the bar chart (Figure 17).

Table 9: Summary of Redevelopment Selection Criteria and Impact

Theme (e.g. survey section)	Site	Stakeholders		
		Citizens	*Public Officials*	*Developers*
Project	Railroad Park	Yes	Yes	Yes
	The Lyric	Yes	Yes	Yes
	Regions Field	Yes	Yes	Yes
Impacts	Railroad Park *pivotal/important*	4/1	3/0	1/0
	The Lyric *pivotal/important*	1/1	0/1	3/0
	Regions Field *pivotal/important*	2/2	1/0	1/0

Legend:
- *Yes: Redevelopment meets selection criteria*
- *Impacts: pivotal or important; e.g., **4/1** means 4 citizen responses indicated Railroad Park (**RR**) was pivotal and 1 response indicated the redevelopment was important to the City's revitalization; **1/1** means 1 citizen respondent felt the Lyric was pivotal and 1 respondent viewed the Lyric redevelopment as important to the City's revitalization, etc.*
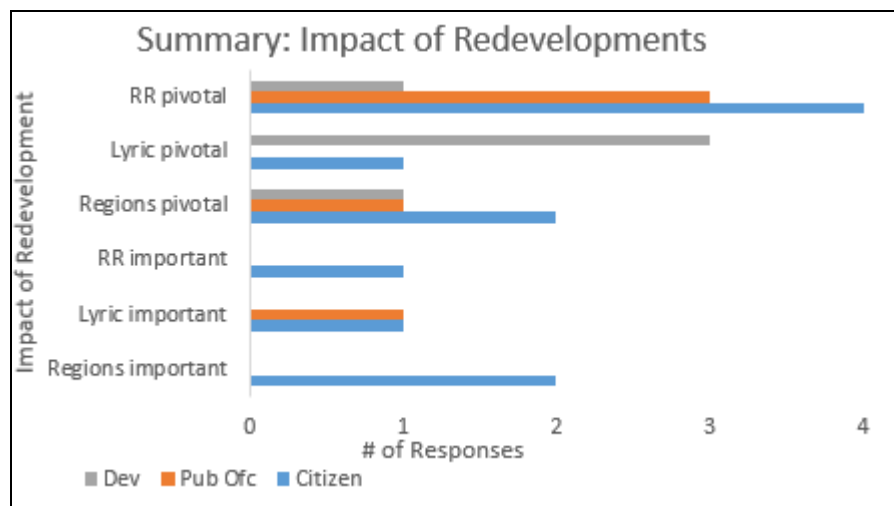

Figure 17: Impact of the Redevelopments

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Based on Table 9 and responses from the survey, all the stakeholders indicated that the three redevelopments (the Lyric, Railroad Park and Regions Field) met the established urban core redevelopment selection criteria. The case study selection requirements were that the redevelopment must have involved citizen engagement; completion of project in Birmingham's urban core/downtown region; addressed public needs; generated indirect/direct business and new residents; and redevelopment was instrumental in Birmingham's downtown revitalization. Each redevelopment met these criteria.

On the other hand, the impact of the redevelopments was perceived somewhat differently by the different categories of stakeholders. As indicated in Table 9 and Figure 17, community residents thought the redevelopments were an important aspect of the downtown's renaissance; however, Railroad Park was the key redevelopment that was seen as being most pivotal. For the Railroad Park redevelopment, citizens' response was 4/1 where 4 citizen responded that the redevelopment was pivotal and 1 citizen responded that the redevelopment was somewhat important. For public officials, the impactful nature of the redevelopments, in particular, Railroad Park and Regions Field were documented in City plans (City of Birmingham Comprehensive Plan (BCP), 2014; RPCGB, 2019). However, survey responses indicated that the Lyric was viewed as a less pivotal redevelopment than Railroad Park and Regions Field. In Table 9, this is shown by the 3/0 and 1/0 responses where Railroad Park redevelopment was viewed by 3 respondents as being pivotal and 1 respondent indicated that Regions Field was seen as pivotal. Figure 17 also shows these results in a bar chart. On the other hand, Figure 17 indicates that the Lyric was seen by 1 public official as being somewhat important to

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Birmingham's downtown core revitalization. For developers/owners, they indicated that

the Lyric, Railroad Park, and Regions Field all played a pivotal role in Birmingham's

downtown revitalization. Reasons for possible disagreement between stakeholders is

discussed in the conclusions section.

Upon the selection of the three case study redevelopments, survey responses

corresponding to the research questions and objectives are summarized in a table format

accompanied by detailed discussion of responses and comparison analysis (Table 10).

Research Question: How well do participatory techniques facilitate public participation
in brownfield redevelopment?

Research Objectives Addressed:
- o Identify stakeholders' participatory process and activity

- o Determine the measure of stakeholder participation

Table 10: Summary of Participatory Techniques and Stakeholders Perceived
Redevelopment Decision-making

Types of Participation	- Public meetings/hearings - Neighborhood events - Town halls - Listserv/newsletters - Online seminars - Visioning workshops - Internet sessions/online participation - Community initiated meetings, e.g., held at common venues-McDonalds, Starbucks, etc.		
Stakeholders' Rate Their Participation (all projects)	**Total Number of Responses by Stakeholders**		
	Citizens	**Public Officials**	**Developers**
5: public initiated		1	4
4: public decision-making	1	1	
3: public feedback	5	2	
2: public receives information	5	1	1
1: no public involvement			

Legend: *Participation Rate: 5-public initiated; 4-public decision-making; 3-public
feedback; 2-public receives information; 1-no public involvement*

Table 11 and Figure 18 also shows the stakeholders rating of their participatory activities. Results are consistent with the technical literature as citizens have greater participation at the public feedback and receiving information levels oppose to public officials and developers' participation who are more engaged at the higher levels of participation (Bartsch, 2003; Solitare, 2005).

Table 11: Stakeholders' Rating of Their Participatory Activities

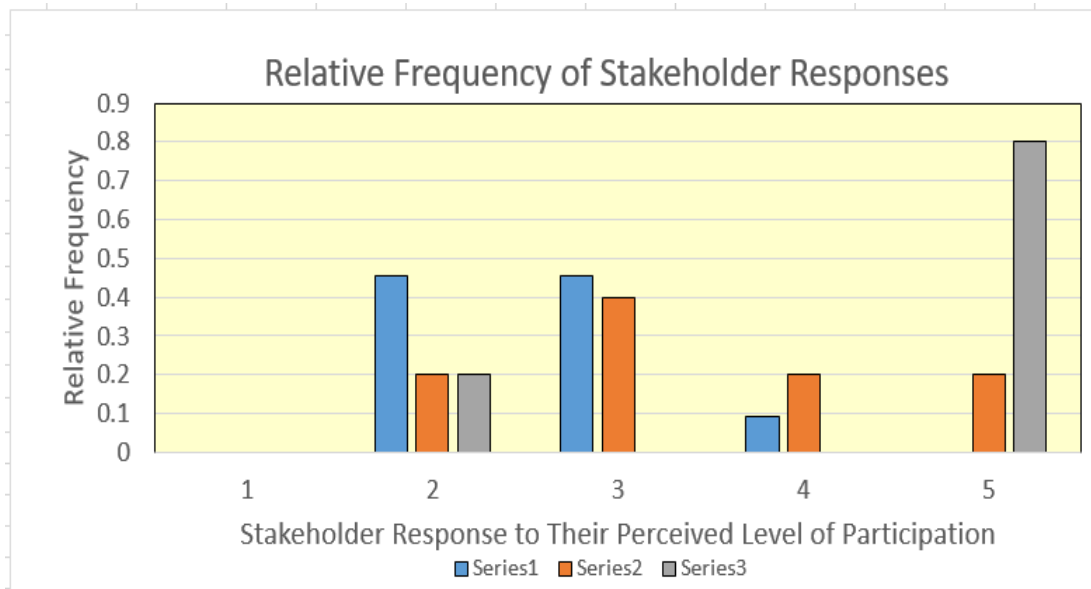| Parameter Responses	Citizens (*Series1*)	Public Officials (*Series2*)	Developers (*Series3*)
1			
2	5	1	1
3	5	2	
4	1	1	
5		1	4
Relative Frequency:			
1			
2	0.4545	0.2	0.2
3	0.4545	0.4	0
4	0.0909	0.2	0
5		0.2	0.8

Figure 18: Stakeholders' Rating of Their Participatory Activities
Legend: Series1=citizens; Series2=public officials; Series3=developers

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Participatory Processes

Based upon findings from the critical analysis, it appears that participatory techniques include EPA's required public participation elements, such as public meetings, notices, and hearings, to newer internet avenues of communication (De Sousa, 2003; U.S. EPA, 2002, 2018). Stakeholders indicated that more creative participatory elements such as the use of media forms of communication, use of neighborhood listserv's and other online participation techniques could likely engage more and younger participants (Table 10). In addition, the city of Birmingham leveraged the use of neighborhood association presidents to setup community meetings at places that were convenient to the residents such as McDonald's and Starbucks (Kemp-Rotan, 2019). This type of participation successfully engaged stakeholders in their own environment and was a creative groundwork form of participatory approach (Billmeier, 2019; Kemp-Rotan, 2019; Leader, 2020).

Furthermore, stakeholder responses indicate that the participation rate between citizen stakeholders and developer/owner stakeholders is the greatest as compared to responses between other stakeholders. Though, all three stakeholders have differing perceived rates of their involvement that occurred during the redevelopment process (Table 10). Although project implementation was a survey question, none of the citizens responded to this question. Ms. Kemp-Rotan (2019), former Director of Capital Projects for the Mayor of Birmingham, and literature supports this result as citizens are typically involved in the upfront planning aspects of an environmental project redevelopment (Bartsch, 2003; Lange and McNeil, 2004). Citizens often do not view themselves as being technical enough to be involved in the project implementation process.

Overwhelmingly, survey responses indicate that public engagement and outreach techniques such as public meetings, notices, and hearings, tend to be dominant. However, in the age of technological advancements, use of online media such as internet participatory techniques seem to be a major vessel for outreach and to encourage impactful engagement (Table 10).

The second research question, objectives and corresponding survey responses are addressed as follows.

Research Question: Utilizing Arnstein's Ladder, are there significant differences in the perceptions of empowerment in the participatory process between stakeholders?

Research Objectives Addressed:
- o Investigate stakeholders' perceptions of participatory decision-making activities;

- o Evaluate the extent participatory elements may have had influencing redevelopment outcomes; and,

- o Compare the perceptions of empowerment in the participatory process between stakeholders.

Survey questions were developed to assess, measure, and compare participatory elements and perceptions of empowerment implemented in the redevelopments. These questions correspond to three of the four research objectives which addressed the overall research goal --- to identify and quantify citizen decision-making in brownfield redevelopment projects through a comparison case study analysis of three pivotal redevelopments in Birmingham, Alabama's core downtown region. Upon answering each of the research questions, the final 'empowerment perception' objective was met. Although the majority of stakeholders responded to the semi-structured questions, responses to the questions were on a volunteer basis therefore, some key questions were

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not answered and the total number of responses were calculated based on the data received. Details of stakeholder perceptions are discussed as follows.

Tables 12 to 18, summarize survey results applicable to the research question and objectives. Specifically, Table 12 and Figure 19 displays stakeholders rating of public participation during the brownfield redevelopments.

Table 12: Redevelopment Public Participation Level

Survey Question:	How do you rate public/community participation during the redevelopment?		
Stakeholders' Rate Public Participation (all projects)	**Total Number of Responses by Stakeholders**		
	Citizens	**Public Officials**	**Developers**
5: public initiated			1
4: public decision-making		2	
3: public feedback	9	3	4
2: public receives information	2		
1: no public involvement			
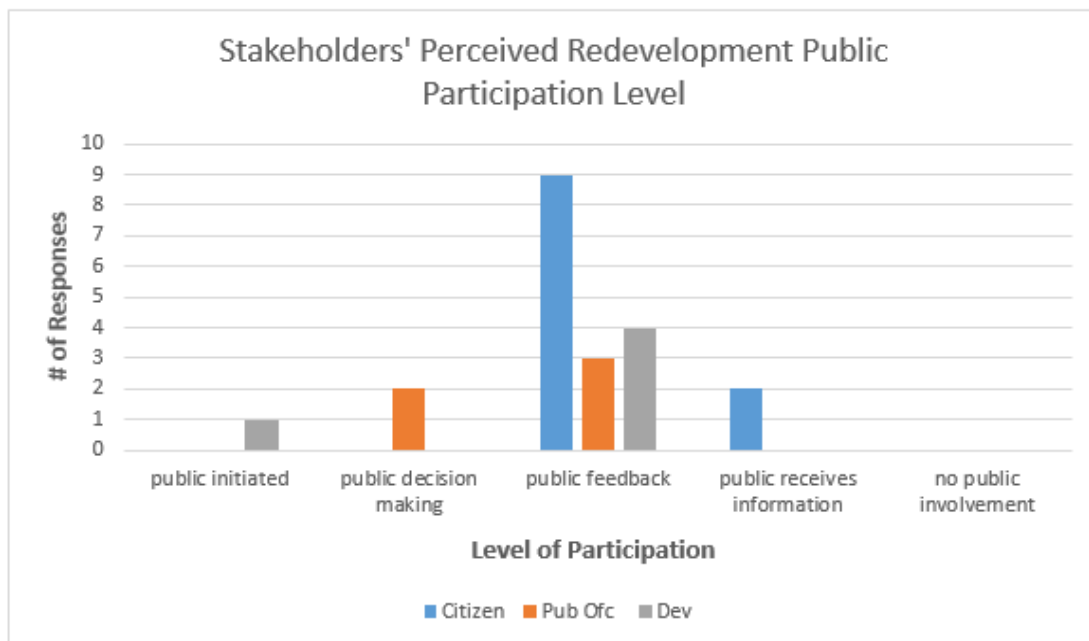
Figure 19: Perceived Public Participation Level in the Redevelopments

The technical literature indicates that public participation typically occurs at the lower level such as the public only being provided information (Solitare, 2005). Research survey results indicate that Birmingham's brownfield redevelopment projects had somewhat above to high public participation rates (Table 12 and Figure 19). Nine of the eleven citizens responded that public participation was supported during the redevelopments as the public was able to provide feedback and was considered in decision-making. Public officials felt citizens not only had decision-making participation but had opportunities to provide valuable feedback during the project redevelopment. Survey responses of citizen participation and public feedback as perceived by public officials were 40% and 60%, respectively (refer to Table 12 and Figure 19). Developers perceived the public's participation was extremely high, 80% public feedback provided and 20% the public initiated participatory processes (Table 12 and Figure 19).

For participatory perceptions, descriptive statistics and comparison analysis were performed utilizing SPSS and Excel, respectively. Figures 20 and 21 are the output results. Figure 20 describes the data. Figure 21 analysis of the data indicates that there are significant differences of empowerment in participatory processes amongst stakeholders. See Appendix C for details of the calculations.

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
cit	11	2.00	3.00	2.8182	.40452
pub	5	3.00	4.00	3.4000	.54772
dev	5	3.00	5.00	3.4000	.89443
Valid N (listwise)	5				

Figure 20: SPSS Descriptive Output

The SPSS 'descriptive' selection provides key stakeholder data such as the mean and standard deviation based on received survey responses to perceived participatory elements (Figure 20). The mean for citizens (cit) was 2.818 with a standard deviation of 0.405, whereas, public officials (pub) and developers' (dev) means were the same at 3.40 and their standard deviation were 0.548 and 0.894, respectively. For citizens, their perceptions did not vary as much as the perceptions of public official and developer stakeholders (see Figure 20). This is an indication that citizens were more consistent with their perceptions of participatory activities. The standard deviation for citizens was 0.405 which indicated that their variation of participation perceptions was relatively low. On the other hand, the perception spread between public officials (pub) and developers (dev) was greater, 0.578 and 0.894, respectively, an indication that the results are somewhat less reliable and more variable than citizens' participation perceptions. This is certainly the case as citizens perceived participation consistently at the 'provide feedback' level.

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Public officials and developers were more dispersed with their levels of participation. Their levels were 'the public providing feedback,' 'public decision-making,' and 'public initiated' participation which are on Arnstein's higher levels of the ladder. This indicates a disconnect in participation expectations between stakeholders of which, participatory elements should be clearly understood and agreed upon at the offset of the project offset (Bartsch, 2003; Solitare, 2005; Schoonover *et al.*, 2019).

Furthermore, Excel's output (Figure 21), shows that citizens' perceptions of participatory activities were very consistent at the participation level of 3. There was smaller variation with perceptions of participation and citizens actively provided feedback. For public officials and developers, their perceptions of participatory elements were at the higher levels of 3, 4 and 5. Their variations were greater (Table 13and Figure 20).

Parameter	Cit	Pub	Dev
Responses	2		
	2		3
	3	3	3
	3	3	3
	3	3	3
	3	4	
	3	4	5
	3		
	3		
	3		
	3		
Sum	31	17	17
n	11	5	5
Mean	2.8182	3.4	3.4
Median	3	3	3
Variance	0.1636	0.3	0.8
Standard Dev.	0.4045	0.5477	0.8944

Figure 21: Excel Output - Stakeholders Rate of Public Participation
Legend:
- *Responses: public participation levels 1 – 5 where the data values are the stakeholders' perceived participatory rating*
- *Parameter: Civ-citizen; Pub-public officials; Dev-developers*

Table 13: Excel t-tests Comparison Analysis

Parameter	Comparison		
	Cit-Pub	Cit-Dev	Pub-Dev
$x_{1,mean} - x_{2,mean}$	0.5818	0.5818	0
Pooled Variance	0.27363	0.41818	0.46904
t-value	2.12626	1.39130	0
Degrees of Freedom	7	5	7
Estimated p-value	0.0379	0.1170	~1.0

Based on the null hypothesis (H_0) established in the methodology section, H_0 states that stakeholder perceptions are the same about participatory elements in the redevelopment process, whereas, the alternative hypothesis (H_1) states that the stakeholder perceptions are not the same about participatory elements in the redevelopment process. That said, Excel results (Figure 21 and Table 13) performing t-test analysis of the uploaded responses from stakeholders show that perceptions of participatory process empowerment were significantly different, at $\alpha = 0.05$, among citizen (cit) and public official (pub) stakeholders ($p=0.04$), whereas, the perception of participatory empowerment among citizen and developer (dev) stakeholders ($p=0.12$) and public official and developer stakeholders ($p=\sim1.0$) were not significant.

The research analyses are based on pooled values. These values were used to improve the efficiency of the estimates as the t-test conditions of normality and the use of ratio/interval data were not a requirement. Moreover, these results were validated using SPSS' Wilcoxon Signed-Rank tests for non-parametric comparison which, in some cases, would be appropriate for the research's analysis of ordinal (scaled) data (see Table 14).

Table 14: SPSS Output: Wilcoxon Signed-Rank Tests

PARAMETER	COMPARISONS		
	cit-pub	cit-dev	pub-dev
SIGNIFICANCE	0.046	0.102	1.00

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Generally, non-parametric statistical techniques have fewer to no assumptions and using parametric statistics on ordinal or non-normal data could produce research results that are flawed (Leedy and Ormrod, 2016). Nonetheless, the Wilcoxon Signed-Rank test is often described as the non-parametric version of the sample t-test (Leedy and Ormrod, 2016). Table 14 confirms the t-tests research results that perceptions among citizen and public official stakeholders were significantly different (p=0.46), whereas, the perception of participatory empowerment amongst citizen and developer stakeholders and public official and developer stakeholders were not significant. Therefore, the similar results produced by using t-tests and the Wilcoxon tests may be associated with the stakeholders' means and the medians being almost identical (Figure 21). T-tests compare means and the Wilcoxon Signed-Rank tests compare medians. For this research, the stakeholders' means and medians are almost the same value thereby similar research results are produced. Detailed output of the Wilcoxon Signed-Rank tests and t-tests are found in Appendix C.

Furthermore, research results indicate that citizens and developers along with public officials and developers observed public participatory elements in the same manner. The level of empowerment between public official and developer stakeholders and citizens and developers were viewed as being equal. This is often where the disconnect in stakeholders' expectations occur, misalignment could impact project outcome, and participatory processes should be clearly understood and established at the project offset (Stenner *et al*., 2002; Bartsch, 2003; Schoonover *et al*., 2019). For Birmingham redevelopments, stakeholders' empowerment appeared to be somewhat shared.

In addition, results of the survey question which evaluates the outcome of the redevelopments is shown in Table 15 and graphically by a bar chart (Figure 22).

Table 15: Redevelopment Outcome Level

Survey Question:	How would you evaluate the outcome of the redevelopment?		
Level of Success (all projects)	**Total Number of Responses by Stakeholders**		
	Citizens	**Public Officials**	**Developers**
5: very successful	2	4	4
4: successful	2	1	1
3: somewhat successful	1		
2: somewhat unsuccessful			
1: not successful			

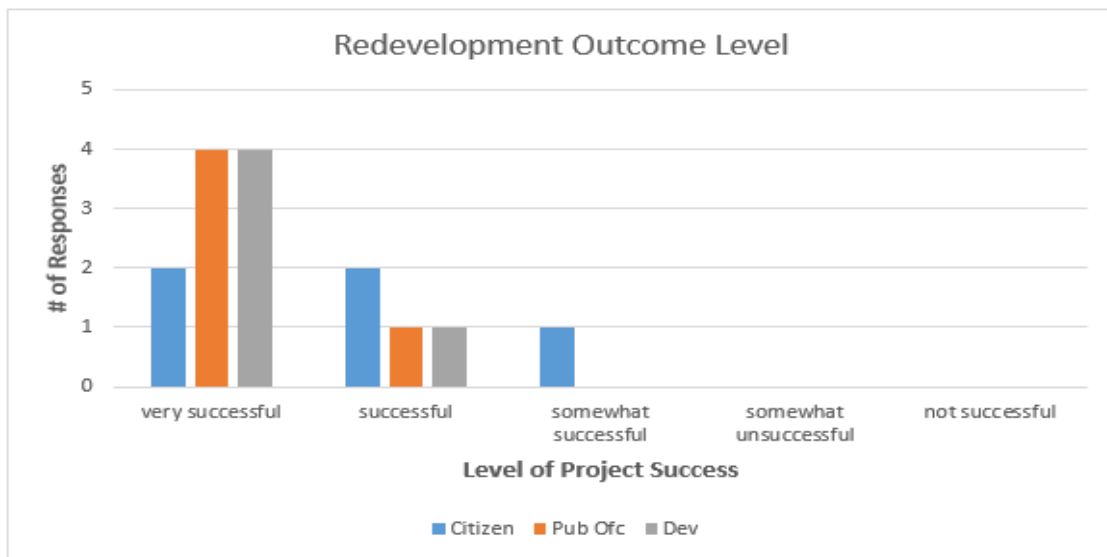**Figure** 22: Stakeholders Rating of Redevelopment Outcome

Survey results indicate that the redevelopments were viewed as successful or very successful by all stakeholders (Table 15 and Figure 22). However, a resident stakeholder responded that they felt the redevelopments were somewhat successful as not all people were pleased with outcomes that directly or indirectly impacted their neighborhood. For

instance, for fixed income, elderly, and low-income residents, higher cost of housing and venue ticket prices being too high were expressed as undesirable outcomes. Nonetheless, 80% of citizens surveyed responded that the redevelopments were successful or very successful (Table 15 and Figure 22). Equally, both public officials and developers viewed the redevelopments as being very successful, 80% of responses, and successful, 20% of the responses (Table 15 and Figure 22). These results indicate that public officials and developers viewed the redevelopment outcomes more successful than citizens. This could be the result of citizens/residents viewing outcomes impacting their cost of living such as higher property values which means higher taxes to live in their homes. On the other hand, developers and public officials' assessment is usually tied to increase in business and property revenue and number of jobs generated (USCM, 2006; U.S. EPA, 2019).

Along the same line and for a survey validity question, Table 16 shows stakeholders' responses that rated the level of their satisfaction with the outcome of the redevelopments. These responses are also displayed graphically in Figure 23. As such, survey responses from residents indicated that 29% were somewhat satisfied and 71% were very satisfied with the redevelopment outcome. Public officials were satisfied 60% and very satisfied 40% of the time, whereas, developers indicated that they were very satisfied 100% of the time with the outcome of redevelopments (Table 16 and Figure 23). These results support the idea that stakeholders' expectations are not always clearly defined, and a misunderstanding of stakeholders' needs could lead to unsatisfactory outcomes, falling short of desired redevelopment outcomes (Bartsch, 2003; Solitare, 2005; Schoonover *et al.*, 2019).

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This could explain the different levels of satisfaction with the redevelopment outcome among stakeholders (Table 16 and Figure 23). To resolve this issue, research suggests that aligning stakeholders' outcomes could be fostered by shared and equitable meaningful participation in project decision-making among stakeholders (Bartsch, 2003; Schoonover *et al.*, 2019).

Table 16: Stakeholders' Satisfaction with Redevelopment Outcome

Survey Question:	To what extent are you satisfied with the redevelopment outcome?		
Level of Satisfaction (all projects)	**Total Number of Responses by Stakeholders**		
	Citizens	**Public Officials**	**Developers**
5: very satisfied	5	2	5
4: satisfied		3	
3: somewhat satisfied	2		
2: somewhat dissatisfied			
1: not satisfied			
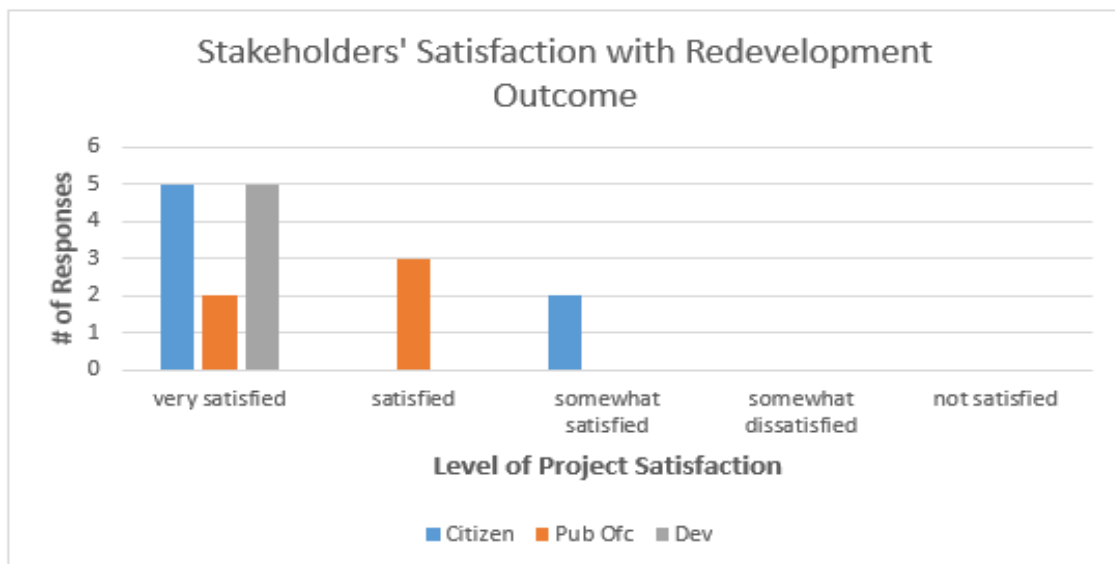
Figure 23: Satisfaction with Redevelopment Outcome

Additionally, responses to survey open-ended questions are summarized as

follows. Table 17 outlines features that stakeholders viewed as aiding the redevelop-

ments. As consistent with the technical literature, one key factor that aided Birmingham's

redevelopments was listening to and addressing the needs of the community (Bartsch,

2003; Solitare, 2005). Survey responses also included: public input of project design;

implementation of strategic redevelopment plans; and, a new attitude of the downtown

were some elements that helped to promote Birmingham's successful redevelopments

(Table 17).

Table 17: Elements that Assisted with the Redevelopments

Survey Question: Do you think there were elements that aided the redevelopment?	- Listen to what the community wanted - Design input from the community - Strategy was developed to make redevelopments occur - New attitude to live downtown

Table 18 contains elements that stakeholders felt hindered the redevelopment. Survey results such as political influence, power inequity among stakeholders, lack of communication, intense public processes, and redevelopment conflict with the public were factors identified as redevelopment hindrance. The technical literature indicates that these are also factors to negatively impact the redevelopment process (Bartsch, 2003; Spiess, 2008; Schoonover *et al.*, 2019). Though there were several factors that impeded Birmingham's redevelopments, it is suspected but not verified, that the City's higher levels of participation (refer to Table 12 and Figure 19) may have had an influence on the redevelopments.

Table 18: Redevelopment Hindrances

Survey Question: Do you think there were elements that hindered the redevelopment?	- Negative mindset of the City's downtown - Citizen concerns of safety/crime - Intense public processes - Push back from residents - Certain stakeholders appeared to be valuable in the process - Lack of communication/late information - Political attitudes downtown

Moreover, Table 19 provides the benefits stakeholders identified resulting from the redevelopment. Giving the City hope, pride, and confidence, decreasing crime, increasing the number of downtown residents, property values, and jobs are a few of the benefits resulting from Birmingham's redevelopments. These benefits are also well-documented in the technical literature as positive outcomes of brownfield redevelopments and Birmingham's active engagement of the public most likely contributed to these results (USCM, 1998. 1999, 2000, 2006; De Sousa *et al.*, 2009; U.S. EPA, 2017a).

Table 19: Benefits of the Redevelopment

Survey Question: What benefit(s) do you feel resulted from the redevelopment?	'Civic living room' for everyone to meet; brought City together - Gave City hope - Civic pride/confidence - Decreased crime - Increased residents, jobs, businesses, and property values downtown - Everyone worked together/private-public partnerships

Lastly, stakeholders were asked to provide input on ways that could have improved redevelopment participatory processes (Table 20). Survey results show that the engagement of younger stakeholders and the implementation of participatory approaches that would be conducive to gain their involvement, such as the use of online technology, could build capacity among this group of stakeholders and have a snowball effect on the participatory process. Hart's (1992) research also suggests the involvement of the youth in participatory effects so that as a young adult, they would be confident and well-versed with participatory decision-making activities. Survey respondents also indicated that this group of stakeholders would be the next generation of civic leaders and advocates of the concerns and needs of the public.

Table 20: Participatory Process Improvements

Survey Question: Is there anything that could have been done to improve the participatory process?	• Engaged younger stakeholders • Implement media participatory approaches • Tailor citizen-centric participatory elements

Overall, the survey findings show that the stakeholders viewed participatory processes as being more than citizens receiving information. Specifically, survey results indicated that public participation occurred at the higher levels of Arnstein's ladder where citizens provided feedback and were involved in decision-making activities. These findings suggest that there was a degree of meaningful participatory processes that occurred with pivotal brownfield redevelopments in Birmingham's urban core region. This result provides evidence, although not verified, that a higher degree of participatory processes is one key factor that can have a positive influence on redevelopment outcome.

The following chapter summarizes findings, draws conclusions, and provides suggestions for future research.

CHAPTER 6

CONCLUSIONS/DISCUSSIONS

To address the gap of limited research of incorporating meaningful participatory elements in brownfield research, this study applied mixed methods methodology to explore the role of citizen participation processes in brownfield redevelopment decision-making. The research assesses three local case studies by employing stakeholder interviews and surveys, news articles, historical meeting records, technical literature, and the internet. Arnstein's ladder of participation was utilized as an evaluative framework to quantify data on public participation in Birmingham, Alabama's brownfield redevelopments.

The research objectives guided the study and the following research questions were developed.

- How well do participation techniques facilitate public participation in brownfield redevelopment?

- Utilizing Arnstein's Ladder, are there significant differences in the perceptions of empowerment in the participatory process between the various stakeholders?

The primary purpose of the research was to conduct a thorough critical review of public participation in brownfield redevelopment decision-making and investigate how well the findings in the technical literature concerning citizen engagement in brownfield redevelopments correspond to actual practice. To that end, this research evaluates

Birmingham, Alabama's local brownfield redevelopments to determine if the redevelopment projects are aligned with the principles of meaningful public participation.

Specifically, the objective of the research was to investigate the extent of citizen participation decision-making in three pivotal brownfield redevelopments in Birmingham, Alabama's downtown revitalization, in an effort to develop best practices for brownfield redevelopment collaboration. Thus, findings of the research indicate that directly addressing citizen needs in the community, listening to the community, and actively engaging citizen stakeholders in their environment can lead to meaningful brownfield redevelopment participatory processes. For this research, meaningful participation is when participation occurs at the higher levels of Arnstein's ladder where citizens provided feedback and are involved in decision-making activities. This is typically defined by Arnstein's citizen power and tokenism categories. Specifically, meaningful participation in brownfield redevelopments can be defined as a process where public participation educates citizens, communicates with them, and incorporates their ideas and comments which can often enhance the quality of project outcome (Rowe and Frewer, 2005).

Nonetheless, survey results strongly suggest that perceived meaningful decision-making amongst stakeholders (i.e., citizens and public officials) are different. For instance, a commitment to listen to what the 'community' needs can lead to synergistic participatory elements amongst stakeholders which is one of many factors that has been linked to positive redevelopment outcomes (Bartsch, 2003; Schoonover *et al.*, 2019). The differing perceptions of stakeholders regarding empowerment was significant as results amongst citizen and public official stakeholders was found to be $p=0.04$. However, the

perception of participatory empowerment among citizen and developer stakeholders was $p=0.12$ and between public official and developer stakeholders was $p=\sim1.0$ which indicated there was no significant difference in their perceptions. This research result shows that public official and developer stakeholders and citizen and developer stakeholders observed public participatory elements in the same manner whereas public officials and citizens have different views of participatory elements. That said, the technical literature supports all stakeholders having a clear and mutual understanding of participatory elements in order to achieve more positive redevelopment outcomes (Stenner *et al*., 2002; Bartsch, 2003; Schoonover *et al*., 2019). Birmingham's redevelopments had many elements where citizens were involved in decision-making activities and their input was utilized in many aspects of the redevelopment projects (Billmeier, 2019). This meaningful involvement approach is often seen as what made Birmingham's pivotal redevelopments successful (Billmeier, 2019; Kemp-Rotan, 2019; Morgan, 2019).

Furthermore, survey results appear to indicate that Birmingham's participatory techniques include EPA's required public participation elements, such as public meetings, notices, and hearings, to newer internet avenues of communication (De Sousa, 2003; U.S. EPA, 2002, 2018). Citizen stakeholders indicated that more creative participatory elements such as the use of various media forms of communication, use of neighborhood listserv's and other online participation techniques would engage more and younger participants. In addition, the city of Birmingham leveraged the use of neighborhood association presidents to setup community meetings at places that were convenient to neighborhood residents such as McDonald's and Starbucks (Kemp-Rotan,

2019). This type of participation successfully engaged stakeholders in their own environment, was a creative "on-the-ground" form of participatory efforts, and is defined as an effective form of meaningful public participation as is indicated by research results and the technical literature (Arnstein, 1969; Morgan, 2019; Leader, 2020).

Similarly, the participation rate between citizen stakeholders and developer/owner stakeholders was the greatest (Appendix C). Generally, this occurs as the differing stakeholder motives typically are the greatest between community residents and developers (Bartsch, 2003; Schoonover *et al.*, 2019). Moreover, SPSS' descriptive results of the data indicates that citizens' ratings of participation had less variation than developers which further supports the disparity in their empowerment perceptions in redevelopments. Developers' rating had the most participatory variation as they ranged from citizens provided information to 'citizens initiated' participatory activities. Nonetheless, all three stakeholders had differing perceived rates of their involvement that occurred during the redevelopment process. This perception difference is often associated with lack of communication and unclear stakeholder participatory elements and motives (Bartsch, 2003; Schoonover *et al.*, 2019).

To that end, this study performed comparison analysis of stakeholders' perceptions of empowerment in the participatory process utilizing Arnstein's ladder of participation as a framework. Arnstein's ladder was a useful tool as assumptions about the role of power in participation are foundational to Arnstein's framework which addresses the research question. This study revealed that Arnstein's ladder was a 'valuable' guide to identify participatory components that were provided by stakeholders, especially beyond the bottom rungs. This is a significant research finding as literature

shows that participatory activities, more often than not, occur at the lower levels of participation (Bartsch, 2003; Solitare, 2005).

Research results also indicate that stakeholders viewed the redevelopments as successful or very successful. The findings suggest, although not verified, that the very successful and successful stakeholder perceptions may be a direct result of the higher levels of citizen participation. Nonetheless, a resident stakeholder responded that they felt the redevelopments were somewhat successful as not all people were pleased with outcomes that directly or indirectly impacted their neighborhood.

For instance, citizen survey responses indicated that for fixed income, elderly, and low income residents, the higher cost of housing and venue ticket prices being high were expressed as undesirable outcomes. Yet, survey responses from residents indicated 29% were somewhat satisfied and 71% were very satisfied with the redevelopment outcome. Public officials were satisfied or very satisfied of the outcome, whereas developers indicated that they were very satisfied 100% of the time with the redevelopment outcome.

Given the satisfied and successful outcomes of Birmingham's redevelopment, a number of benefits were expressed. The most commonly touted benefit was how the redevelopments contributed to the 'positive' image of Birmingham which gave the City 'hope, civic pride, and confidence' (Table 18). The establishment of private-public partnerships was also a heavily cited benefit along with a decrease in crime and an insurgence of new residents, businesses, and jobs in the urban core downtown region which tends to be outcomes consistent with the literature (De Sousa, 2017; Wang *et al.,* 2011).

Accordingly, this research attempts to determine if meaningful participation in the practice of brownfield redevelopment occurred in Birmingham's projects. That is, meaningful participation in brownfield redevelopments defined as a process where public participation educates citizens, communicates with them, and incorporates their ideas and comments which can often enhance the quality of project outcome (Rowe and Frewer, 2005). Moreover, meaningful participation is when participation occurs at the higher levels of Arnstein's ladder where citizens provided feedback and are involved in decision-making activities. This is typically defined by Arnstein's citizen power and tokenism categories. Therefore, results of this study showed that stakeholders' participatory responses were typically rated at the higher levels of Arnstein's ladder where citizens are involved in decision-making. Citizens engagement in decision-making is also known as meaning participation.

Furthermore, the technical literature suggests the need for citizens to play a greater role in shaping the decisions that affect their well-being. Stakeholders such as public officials and developers recognize the benefits of involving citizens in their decision-making processes (Bartsch, 2003; Lange and McNeil, 2004; U.S. EPA 2002, 2019). As such, it is believed that the public should be part of participatory redevelopment processes and there are many laws, regulations, and policies that call for public participation in environmental decision-making (Webler *et al.,* 2001; U.S. EPA, 2002). Research findings suggest the incorporation of greater participatory decision-making amongst citizens was impactful for achieving positive redevelopment outcomes.

Despite many calls for increased public participation in the literature and in practice, achieving meaningful citizen participation may not be necessary in all phases

and the project's ultimate goal should be to focus on the needs of the communities as defined by the communities themselves. For instance, although project implementation was a survey question, none of the citizens responded to this question. The technical literature and survey responses supports this result as citizens are typically involved in the upfront planning aspects of an environmental or redevelopment project as this phase is considered one of the influential factors of successful project outcome (Bartsch, 2003; Lange and McNeil, 2004; Kemp-Rotan, 2019). Therefore, redevelopment success is achieved when stakeholders' needs have been fairly considered and addressed (Bartsch, 2003). That said, stakeholders expressed Birmingham's redevelopment success is greatly attributed to listening and addressing the community's needs (Billmeier, 2019; Morgan, 2019). Survey data supports that greater stakeholder involvement, i.e., meaningful participation, occurred in Birmingham's projects which the literature suggest is linked to more positive redevelopment outcome (Bartsch, 2003; Solitare, 2005).

Note, the applicability and generalization of research results may be limited to cities with similar characteristics as Birmingham, Alabama. Further, this research is limited to three local brownfield redevelopments that occurred in the downtown core of Birmingham and may contain bias provided by the stakeholders. Research results are also based on minimal interviews and survey responses that may contribute to bias as Birmingham has its unique historic, economic, cultural, and political environment.

Future Research Recommendations

Further research would be to develop an evaluation tool to determine meaningful citizen participation in redevelopment decision-making process. The establishment and evaluation of redevelopment participatory benchmarks would be jointly developed by

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citizens, public officials, and developers to ensure community needs are clearly and effectively addressed.

A longitudinal assessment of overall success of various redevelopment projects based on equity creation would be another research avenue. For instance, not only does redeveloped brownfields increase tax revenue and create jobs but does the redevelopment improve residents' household income, quality of life and/or education? Though difficult to track, other measurable impacts of brownfield redevelopments could be an evaluation of gentrification. Likewise, environmental justice could be another exploratory avenue of brownfield research where demographic statistics would be necessary. Obtaining data on these elements of brownfield redevelopment could assist with policy development.

Additionally, evidence supports 'positive' relationships between redevelopment outcome and public participation and a large sample thoroughly analyzing responses by neighborhoods could prove valuable as the characteristics and demographics for each neighborhood typically differs. Tailoring participatory elements to a specific neighborhood is a way to encourage meaningful participation among members of a community and improve project outcomes and area satisfaction. Moreover, analysis of neighborhoods would provide decision-making authorities with valuable data on the concentration of participation in various neighborhoods of which, the authorities would be able to implement programs to engage more meaningful participation. Equally, participatory techniques beneficial to certain demographics would be a useful tool for other areas with similar demographics.

For instance, responses received from stakeholders indicated that the Five Points South neighborhood in Birmingham tends to have younger, higher income individuals

where online media may be a better form of communication and participation. This area could benefit from participatory elements that utilizes the full power of online mechanisms as younger individuals are known to leverage the convenience of technology. This approach would also address one of the survey comments that indicated younger individuals needed to be more involved in community participatory activities. The concept of adapting participatory elements to neighborhoods is contrary to early participatory theory (Clavel, 1994). These theories, which dominated the strategies for many of the participation initiatives, typically was less sensitive to methodologies that considered local context (Clavel, 1994). Moreover, exploring this bottom up approach where local residents initiate participatory elements appears to be an option to engage citizens in more meaningful decision-making processes.

Lastly, comparative research between cities and countries could be other opportunities for research. Policy development that could implement meaningful participation in brownfield redevelopment has worldwide application. These problem properties are universal, have worldwide impacts, and successful redevelopment would lessen the burden on the environment and globally support new economic opportunities

Research Summary

This study adds to the academic body of brownfield research and fills a gap of limited research of measuring participatory elements and offering ways to incorporate meaningful decision-making in redevelopments. This work also addresses limited studies that highlight redevelopments in the Southeast and in Birmingham, Alabama (Nolan, 2018). To that end, it is important to understand how the extent of public participation in

project decision-making may promote or hinder brownfield redevelopment. The growing

number of brownfields and often limited available urban space, provides an ideal

situation to spur brownfield redevelopment projects where positive outcomes are often

tied to public participation (Bartsch, 2003). While Birmingham represents cities all across

the U.S., effectively incorporating meaningful participatory techniques in brownfield

redevelopments is essential.

This work is timely as the number of brownfields are expected to increase (Paull,

2008). Dissatisfaction has been expressed with brownfield redevelopment not addressing

community needs and creating unanticipated consequences such as gentrification

(Maantay and Maroko, 2018). This fact gives more reason for understanding how to

effectively incorporate meaningful participatory activities which can result in equitable

outcomes for all stakeholders, especially those most affected by the brownfield

redevelopment (Solitare, 2005). This research does not suggest that meaningful

participation leads to redevelopment success, but the research serves as a foundation for

which meaningful participatory redevelopment process strategies can begin that could

contribute to the likelihood of brownfield redevelopment success. Overall, research results

could assist with developing brownfield best practices and aid in policy development.

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APPENDICES

Citizens' Questions

LEGEND

Level of Participation (scale 1 – 5) *	**Level of Success (scale 1 – 5) ***
1: no public involvement	1: not successful
2: public receives information	2: somewhat unsuccessful
3: public provides feedback	3: somewhat successful
4: public involved in decision making	4: successful
5: public initiated	5: very successful

Level of Satisfaction (scale 1 – 5) **

1: not satisfied
2: somewhat dissatisfied
3: somewhat satisfied
4: satisfied
5: very satisfied

Project

1. What Birmingham redevelopment were you involved with?

2. Where was the strongest support for this redevelopment coming from? (prompt: city, developers, community/public/residents, or other: please identify)

3. What part of the redevelopment were you involved with? (prompt: overall /coordination; planning/event attendance; site selection/pre-assessment; implementation/cleanup or end/outcome, or other: please identify)

4. What was your role(s)/position?

Participation

5. During the part(s) of the redevelopment for which you were part of, did you have an opportunity to observe public participation? (Yes or No)
    If so,
    a. Who initiated the public participation? (prompt: City, community group, consultant, developer or other: please identify)
    b. Describe the type(s) of participation. (e.g., public hearing, neighborhood meeting, newsletter, community initiated event, or other: please identify)
    c. How would you rate your level of participation during the above event(s)? (scale: 1-5) *

d. How do you rate public/community participants' involvement in the following areas during the redevelopment? (scale: 1-5) *****
 - Participation events described above in question **5b**
 - Express concerns and needs of the area
 - Project design input
 - Express desired redevelopment outcome
 - Project implementation

e. Did or how did public participation change through the course of the redevelopment? (prompt: increased, decreased or consistently the same)

6. Is there anything that could have been done to improve the participatory process?

Impacts

7. Do you think there were elements that aided the redevelopment? (Yes or No) If so, why and which one(s)?

8. Do you think there were elements that hindered the redevelopment? (Yes or No) If so, why and which one(s)?

9. How would you classify the impact of the redeveloped project on the City's revitalization and why? (prompt: 1-pivotal; 2-somewhat important; 3-inconsequential)

Outcomes

10. To what extent do you think the redevelopment was successful? Please explain why: _____

11. How would you evaluate the outcome of the redevelopment? (scale: 1-5) ******

12. What benefit(s) do you feel resulted from the redevelopment?

13. To what extent are you satisfied with the outcome? (scale: 1-5) *******
    Why?

Optional

14. How long have you lived in your neighborhood?
15. To what is your age? (range: under 18; 18-34; 35-64; or 65 and over)
16. What is your highest level of education?
17. Please specific your ethnicity.
18. What is your marital status? (i.e., single, never married; married/partner; widowed; divorced/separated).
19. Please provide your household income.

FOR THIS RESEARCH: Stakeholders include the public/citizens, public officials, and developers.

IRB-300002746

Public Official Questions

<u>**LEGEND**</u>

Level of Participation (scale 1 – 5) *   **Level of Success (scale 1 – 5) ****
1: no public involvement   1: not successful
2: public receives information   2: somewhat unsuccessful
3: public provides feedback   3: somewhat successful
4: public involved in decision making   4: successful
5: public initiated   5: very successful

Level of Satisfaction (scale 1 – 5) **
1: not satisfied
2: somewhat dissatisfied
3: somewhat satisfied
4: satisfied
5: very satisfied

Project
1. What Birmingham redevelopment were you involved with?

2. Where was the strongest support for this redevelopment coming from? (prompt: city, developers, community/public/residents, or other: please identify)

3. What part of the redevelopment were you involved with? (prompt: overall /coordination; planning/event attendance; site selection/pre-assessment; implementation/cleanup or end/outcome, or other: please identify)

4. What was your role(s)/position?

Participation
5. During the part(s) of the redevelopment for which you were part of, did you have an opportunity to observe public participation? (Yes or No)
    If so,

    a) Who initiated the public participation? (prompt: City, community group, consultant, developer or other: please identify)

    b) Describe the type(s) of participation. (e.g., public hearing, neighborhood meeting, newsletter, community initiated event, or other: please identify)

    c) How would you rate your level of participation during the above event(s)? (scale: 1-5) *

d) How do you rate public/community participants' involvement in the following areas during the redevelopment? (scale: 1-5) *****

  - Participation events described above in question **5b**
  - Express concerns and needs of the area
  - Project design input
  - Express desired redevelopment outcome
  - Project implementation

e) Did or how did public participation change through the course of the redevelopment? (prompt: increased, decreased or consistently the same)

6. Is there anything that could have been done to improve the participatory process?

7. To what do you attribute the effectiveness (or ineffectiveness) of the participatory efforts?

Impacts
8. Do you think there were elements that aided the redevelopment? (Yes or No) If so, why and which one(s)?

9. Do you think there were elements that hindered the redevelopment? (Yes or No) If so, why and which one(s)?

10. How would you classify the impact of the redeveloped project on the City's revitalization and why? (prompt: 1-pivotal; 2-somewhat important; 3-inconsequential)

Outcomes
11. To what extent do you think the redevelopment was successful? Please explain why: _____

12. How would you evaluate the outcome of the redevelopment? (scale: 1-5) ******

13. What benefit(s) do you feel resulted from the redevelopment?

14. To what extent are you satisfied with the outcome? (scale: 1-5) ******* Why?

FOR THIS RESEARCH: Stakeholders include the public/citizens, public officials, and developers.

IRB-300002746

Developers' Questions

LEGEND
Level of Participation (scale 1 – 5) *   **Level of Success (scale 1 – 5) ****
1: no public involvement   1: not successful
2: public receives information   2: somewhat unsuccessful
3: public provides feedback   3: somewhat successful
4: public involved in decision making   4: successful
5: public initiated   5: very successful

Level of Satisfaction (scale 1 – 5) ***
1: not satisfied
2: somewhat dissatisfied
3: somewhat satisfied
4: satisfied
5: very satisfied

Project

1. What Birmingham redevelopment were you involved with?

2. Where was the strongest support for this redevelopment coming from? (prompt: city, developers, community/public/residents, or other: please identify)

3. What part of the redevelopment were you involved with? (prompt: overall /coordination; planning/event attendance; site selection/pre-assessment; implementation/cleanup or end/outcome, or other: please identify)

4. What was your role(s)/position?

Participation

5. During the part(s) of the redevelopment for which you were part of, did you have an opportunity to observe public participation? (Yes or No)
    If so,

    a) Who initiated the public participation? (prompt: City, community group, consultant, developer or other: please identify)

    b) Describe the type(s) of participation. (e.g., public hearing, neighborhood meeting, newsletter, community initiated event, or other: please identify)

    c) How would you rate your level of participation during the above event(s)? (scale: 1-5) *

d) How do you rate public/community participants' involvement in the following areas during the redevelopment? (scale: 1-5) *

- Participation events described above in question **5b**
- Express concerns and needs of the area
- Project design input
- Express desired redevelopment outcome
- Project implementation

e) Did or how did public participation change through the course of the redevelopment? (prompt: increased, decreased or consistently the same)

6. Is there anything that could have been done to improve the participatory process?

Impacts
7. Do you think there were elements that aided the redevelopment? (Yes or No) If so, why and which one(s)?

8. Do you think there were elements that hindered the redevelopment? (Yes or No) If so, why and which one(s)?

9. How would you classify the impact of the redeveloped project on the City's revitalization and why? (prompt: 1-pivotal; 2-somewhat important; 3-inconsequential)

Outcomes
10. To what extent do you think the redevelopment was successful? Please explain why: _____

11. How would you evaluate the outcome of the redevelopment? (scale: 1-5) **

12. What benefit(s) do you feel resulted from the redevelopment?

13. To what extent are you satisfied with the outcome? (scale: 1-5) ***
Why?

FOR THIS RESEARCH: Stakeholders include the public/citizens, public officials, and developers.

IRB-300002746

November 2019

APPENDIX B

IRB (Institutional Review Board) Approval Letter

APPROVAL LETTER

TO: Cutts, Sandra

FROM: University of Alabama at Birmingham Institutional Review Board
Federalwide Assurance # FWA00005960
IORG Registration # IRB00000196 (IRB 01)
IORG Registration # IRB00000726 (IRB 02)

DATE: 29-Nov-2019

RE: IRB-300002746
Brownfield Redevelopments in Birmingham, Alabama: An Evaluation of the Role of Citizen Participation Utilizing the Framework of Arnstein's Ladder

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The IRB reviewed and approved the Revision/Amendment submitted on 21-Nov-2019 for the above referenced project. The review was conducted in accordance with UAB's Assurance of Compliance approved by the Department of Health and Human Services.

Determination: Not Human Subjects Research
Approval Date: 29-Nov-2019
Expiration Date:

Documents Included in Review:

- praf.191121

APPENDIX C
EXCEL & SPSS OUTPUT

EXCEL OUTPUT

Excel analysis comparing stakeholders' perceptions of public participation, where the
- Null hypothesis (H_0) states that stakeholder perceptions are the same about participatory elements that occurred in Birmingham, Alabama's redevelopment process.
- Alternative hypothesis (H_1) states that the stakeholder perceptions are not the same about participatory elements in the redevelopment process.

Comparison t- tests were performed between stakeholders and results are as follows.

Stakeholders Survey Responses: Perceived Public Participation

Parameter	Cit	Pub	Dev
Responses	2		
	2		3
	3	3	3
	3	3	3
	3	3	3
	3	4	
	3	4	5
	3		
	3		
	3		
	3		
Sum	31	17	17
n	11	5	5
Mean	2.8182	3.4	3.4
Median	3	3	3
Variance	0.1636	0.3	0.8
Standard Dev.	0.4045	0.5477	0.8944

Legend
cit = Citizens/residents rate public participation during the redevelopment
pub = Public Officials rate public participation during the redevelopment
dev = Developers/Owners rate public participation during the redevelopment
Responses: 2 = public receives information; 3 = public provides feedback; 4 = public decision-making; 5 = public initiated event/activity

Results of t-test comparison

Parameter	Comparison		
	Cit-Pub	Cit-Dev	Pub-Dev
$x_{1,mean} - x_{2,mean}$	0.5818	0.5818	0
Pooled Variance	0.27363	0.41818	0.46904
t-value	2.12626	1.39130	0
Degrees of Freedom	7	5	7
Estimated p-value	0.0379	0.1170	~1.0

Calculations for Perception Comparisons Between Stakeholders

Denominator for t-calculation:	
$(S_x^2/n_x + S_y^2/n_y)$ -- variance	
Degrees of Freedom Estimation:	
$[(S_x^2/n_x + S_y^2/n_y)]^2$ (numerator)	
$[(S_x^2/n_x)^2/(n_x - 1) + (S_y^2/n_y)^2/(n_y - 1)]$ (denominator)	

Hypothesis testing and calculations: Citizens and Public Officials

H_o: Pub - Cit = 0; H_1: Pub - Cit $\geq$ 0		
Cit-Pub Pooled Variance Calculation:		
0.5818	$x_{1,mean} - x_{2,mean}$	
0.07488	(pooled variance denominator)	
0.27363	(pooled variace standard deviation)	
2.12626	t-calculated	
0.07488	Degrees of Freedom (numerator)	
0.00561	Degrees of Freedom (square)	
0.01488	(S_x^2/n_x)	
0.06	(S_y^2/n_y)	
0.07488	$(S_x^2/n_x + S_y^2/n_y)$	
0.00561	$[(S_x^2/n_x + S_y^2/n_y)]^{1/2}$	
0.00022	$(S_x^2/n_x)^2$	
0.0036	$(S_y^2/n_y)^2$	
0.00092	$[(S_x^2/n_x)^2/(n_x - 1) + (S_y^2/n_y)^2/(n_y - 1)]$ (denominator)	
6.079861	degrees of freedom	

Hypothesis testing and calculations: Citizens and Developers

Value	Description
	H_o: Dev - Cit = 0; H_1: Dev - Cit $\geq$ 0
	Cit-Dev Pooled Variance Calculations:
0.5818	$x_{1,mean} - x_{2,mean}$
0.17488	(pooled variance denominator)
0.41818	(pooled variace standard deviation)
1.39130	t-calculated
0.17488	Degrees of Freedom (numerator)
0.03058	Degrees of Freedom (square)
0.01488	(S_x^2/n_x)
0.16	(S_y^2/n_y)
0.17488	$(S_x^2/n_x + S_y^2/n_y)$
0.03058	$[(S_x^2/n_x + S_y^2/n_y)]^{1/2}$
0.00022	$(S_x^2/n_x)^2$
0.0256	$(S_y^2/n_y)^2$
0.00642	$[(S_x^2/n_x)^2/(n_x - 1) + (S_y^2/n_y)^2/(n_y - 1)]$ (denominator)
4.76191	degrees of freedom

Hypothesis testing and calculations: Public Officials and Developers

Value	Description
	H_o: Pub - Dev = 0; H_1: Pub - Dev $\neq$ 0
	Pub-Dev Polled Variance Calculations:
0	$x_{1,mean} - x_{2,mean}$
0.22	(pooled variance denominator)
0.46904	(pooled variace standard deviation)
0	t-calculated
0.22	Degrees of Freedom (numerator)
0.0484	Degrees of Freedom (square)
0.06	(S_x^2/n_x)
0.16	(S_y^2/n_y)
0.22	$(S_x^2/n_x + S_y^2/n_y)$
0.0484	$[(S_x^2/n_x + S_y^2/n_y)]^{1/2}$
0.0036	$(S_x^2/n_x)^2$
0.0256	$(S_y^2/n_y)^2$
0.0073	$[(S_x^2/n_x)^2/(n_x - 1) + (S_y^2/n_y)^2/(n_y - 1)]$ (denominator)
6.63014	degrees of freedom

SPSS OUTPUT

Stakeholders perceptions of public participation level

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
cit	11	2.00	3.00	2.8182	.40452
pub	5	3.00	4.00	3.4000	.54772
dev	5	3.00	5.00	3.4000	.89443
Valid N (listwise)	5				

Legend
cit = Citizens/residents rate public participation during the redevelopment
pub = Public Officials rate public participation during the redevelopment
dev = Developers/Owners rate public participation during the redevelopment

Stakeholders responses were upload, coded based on participation level.

Responses: *5-public initiated; 4-public decision-making; 3-public feedback; 2-public receives information; 1-no public involvement*

Parameter	Cit	Pub	Dev
Responses	2		
	2		3
	3	3	3
	3	3	3
	3	3	3
	3	4	
	3	4	5
	3		
	3		
	3		
	3		

Additional analysis using Wilcoxon tests' (a non-parametric test) output is as follows.

```
NPTESTS
  /RELATED TEST(cit pub)
  /MISSING SCOPE=ANALYSIS USERMISSING=EXCLUDE
  /CRITERIA ALPHA=0.05  CILEVEL=95.
```

Nonparametric Tests

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between cit and pub equals 0.	Related-Samples Wilcoxon Signed Rank Test	.046	Reject the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

```
NPTESTS
  /RELATED TEST(cit dev)
  /MISSING SCOPE=ANALYSIS USERMISSING=EXCLUDE
  /CRITERIA ALPHA=0.05  CILEVEL=95.
```

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between cit and dev equals 0.	Related-Samples Wilcoxon Signed Rank Test	.102	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

```
NPTESTS
  /RELATED TEST(dev pub)
  /MISSING SCOPE=ANALYSIS USERMISSING=EXCLUDE
  /CRITERIA ALPHA=0.05  CILEVEL=95.
```

Hypothesis Test Summary

	Null Hypothesis	Test	Sig.	Decision
1	The median of differences between dev and pub equals 0.	Related-Samples Wilcoxon Signed Rank Test	1.000	Retain the null hypothesis.

Asymptotic significances are displayed. The significance level is .05.

APPENDIX D

Survey Respondent Data

Survey Respondent	*# Received Surveys/Interviews*
Citizens, Residents, Community Advocates	11
EPA, City of Birmingham, Mayors Office	5
Developers, Owners, Executive Officer	5

APPENDIX E

Neighborhood Listserv Flyer