

PERCEPTION OF ON-PREMISE COMMERCIAL SIGN REGULATIONS: A COMPARISON BETWEEN
DESIGNERS AND NON-DESIGNERS

By

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ABSTRACT

PERCEPTION OF ON-PREMISE COMMERCIAL SIGN REGULATIONS: A COMPARISON BETWEEN DESIGNERS AND NON-DESIGNERS

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Creating an attractive public realm drives the economic, cultural and social development of modern cities (Witter & Crawford, 2013; Pugalis, 2009). Regulation has long since guided urban growth, and it is essential for municipalities today to construct regulation that is conducive to creating visually stimulating public spaces. As an influential aspect of a modern streetscape, commercial signage can contribute to visual pollution if not properly regulated (Crawford, Lee, & Beatty, 2015; Portella, 2014). Little scientific research has been conducted on the impacts of commercial signage and the varying arrangements created by different sign regulations in regards to perception (Jourdan, Hurd, & Hawkins, 2013; Portella, 2014).

Developing sign codes that reflect the desires of the people is the responsibility of planning and design professionals (Pendlebury & Townshend, 1999; Kaplan & Kaplan, 1989). With the rise of public involvement in planning (Lane, 2006; Sanoff, 2000), it is essential that designers and non-designers can coordinate to develop proper sign controls which contribute to urban growth. This research studies the differences and similarities in perceptions of planning and design professionals and non-designers to aid in the development of future, more positively perceived signage regulation. By using visual models presented in the form of a survey, findings show both similarities and differences between these groups in their assessment of signscapes regarding communication, perceptions of characteristics like beauty, interest and order, an overall preference toward highly structured codes, and a difference in harshness of evaluation.

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Chapter 1: Introduction

Cities today are striving to create an attractive, thriving public realm to further their economic, cultural and social development (Witter & Crawford, 2013; Pugalís, 2009). With the recent resurgence of the city centre, municipalities are trying to capture the growing populous who are migrating from the suburbs back to the city (Cohen, Harchard, & Wilson, 2015). Through branding and the formation of dense, diverse and lively places, cities are competing with one another by making themselves more attractive to entrepreneurs, young professionals, and couples with dual income and no kids (DINKS) who can bring economic growth and stability (Witter & Crawford, 2013). In his article, *The Culture and Economics of Urban Public Space Design*, Pugalís (2009) describes modern urban design as a catalyst for regeneration, which is a necessary action for many municipalities to rebound from the devastating effects of the great recession. To create these quality environments, it is essential for cities to construct a plan to guide urban growth.

With the advent of zoning in the early 1920's, land-use began to designate how cities would be shaped through the separation of zones, like commercial, industrial, and residential districts (Liebermann, 2002). For nearly one hundred years, land-use regulation has had a great impact on the structural, social, and economic development of American cities (Darden, 2016). In the United States, the fields of urban planning and design are relatively new in comparison to sister professions, like architecture and engineering. The American Society of Landscape Architects was founded in 1899 as the first association in the U.S. to organize professionals within the field of land planning and design (American Society of Landscape Architects, 2016). According to the American Planning Association (2015), in 1909 the first National Conference of

City Planning was held in Washington, D.C. and is one of the oldest professional collaborations of its kind. Shortly thereafter, in 1917 the American Institute of Planners was founded, followed by the American Planning Association, which was established in October of 1978 (American Planning Association, 2015). These organizations and the professionals within these fields continue to have a great influence on the regulations that shape urban place today.

Developing regulation has long since been an area of great contempt for both planners and designers and those who they are designing for (Pendlebury & Townshend, 1999; Kaplan & Kaplan, 1989). As public involvement in planning has become increasingly prevalent (Lane, 2006; Sanoff, 2000), it is more important than ever for professionals and non-professionals to effectively collaborate in order to create successful regulations to advance urban growth and development. It would seem as though the education and training a planning and design professional receives would alter their perception of the urban landscape, but there is conflicting evidence on whether or not this perception varies much, or at all, from laypeople (Portella, 2014; Yung & Chan, 2013; Gjerde, 2011; Pugalís, 2009; Coeterier, 2002; Kaplan & Kaplan, 1989; Cakin 1976). It can be argued that if these two groups do not perceive the environment similarly, then it would be much more difficult for planning and design professionals to provide their clients with products that accurately represent their wants, needs, and desires. Understanding how these groups think and communicate is a first step in effectively creating a collaborative environment for urban development.

The urban landscape is comprised of many parts, all regulated by a municipal code. As one of these many parts, signage is an important element within the urban environment. Both wayfinding and commercial signs line the modern American street (Meikle, 2013). Their primary

function is communication and they are regulated by a municipalities' code or ordinance to protect the health, safety and general welfare of the public (Strauss, Jourdan, & Weinstein, 2014; Jourdan, Hurd, & Hawkins, 2013). A collection of signs within a streetscape, also known as a signscape, can have a pronounced effect on the socio-economic productivity of a place (Rexhausen, Hildebrandt, & Auffery, 2012; Stotmeister, 2013; Taylor, Sarkees, & Bang, 2012; Alford, 2011). A legible and well organized signscape can increase positive perception and economic activity, while the latter can lead to visual pollution.

The subject of user perception of on-premise commercial signage has not been studied in great detail. Existing research has found commercial signage to contribute to visual clutter and have the potential to decrease the aesthetic quality of the external environment (Jourdan, Hurd, & Hawkins, 2013; Portella, 2014), but little scientific research has been conducted on user perception of commercial signage and sign controls. Because of the visual impact that signage can have on the public realm (Crawford, Lee, & Beatty, 2015; Berger, 2014; Portella, 2014; Nasar & Hong, 1999), proper regulation of these structures is a key component to creating visually stimulating public spaces. By connecting environmental perception and signage, it is apparent that gap in research exists concerning the perceptions of professional planners/designers and non-professional planners/designers in regards to on-premise commercial sign regulation.

Purpose of Study

The purpose of this interpretive study is to understand the similarities and differences of perceptions between professional designers/planners and non-professional planners/designers regarding on-premise commercial sign controls within urban corridors. This mixed methods

study will employ the use of a survey to quantify perceptions of model streetscapes with three different sign code applications: zoning, form-based and no-code sign controls. The survey will utilize open ended questions as a tool to elaborate on the findings of the qualitative data. The desired sample population will include a mix of non-local and local residents, a variety of distinct stakeholder groups, and a combination of additional socio-demographic identifiers such as age, sex, and education. The area of research is located in the Greater Lansing Area of Michigan, and focuses on a span of the Michigan Avenue streetscape which extends over two municipalities, the City of East Lansing and the City of Lansing. By understanding the perceptions of on-premise sign controls by different user groups, this study can add to the greater body of knowledge regarding sign regulation and design.

Significance of Study

This study will benefit those who are involved in producing, enforcing, and abiding by on-premise commercial sign codes. By exploring the impact of sign codes on the perceptions of professional designers/planners and non-professional planners/designers, professional planners, municipalities, and business owners will be able to use aspects of this research to create more effective, defensible, and positively perceived sign codes. With more scientific studies related to perception of signage regulation, sign controls can more successfully protect the health, safety and general welfare of a community, defend the public's first amendment rights related to commercial free speech, and facilitate better understanding between the planning/design community and those who they are designing for.

Chapter 2: Literature Review

This literature review explores the existing research related to commercial sign regulation and the perceptions of professional planners/designers and non-professional planners/designers. For the purpose of this study, **professional planners/designers** will be referred to as **designers**, while **non-professional planners/designers** will be referred to as **non-designers**. The first portion of this chapter reviews literature concerning public participation in planning and the perceptions of urban space of both designers and non-designers. The second section provides a background on commercial signage and sign regulation. The last section of the text references perception of commercial signage, connecting to environment and behavior history, theory and recent studies. This literature review concludes with a summary which reveals common themes within the existing body of research and discusses prominent gaps for future exploration.

Public Participation in Planning

Public participation is defined by James Creighton (2005, p. 7) as “The process by which public concerns, needs, and values are incorporated into governmental and corporate decision making. It is two-way communication and interaction, with the overall goal of better decisions that are supported by the public.” The process of planning and public participation has evolved significantly over the last century (Lane, 2006). Early forms of planning were dependent on expert knowledge and perception, and included little to no involvement from laypeople. The synoptic model of planning developed in the late 1950’s as a response to the surge of private ownership of automobiles. The synoptic model’s emphasis on establishing goals was the gateway

for professional facilitated public planning coordination. Other planning paradigms followed including incrementalism and the mixed scanning approach, but it wasn't until the late 1960's that multiplicity in public desires began to be addressed. Contemporary planning is described as the Theoretical Pluralism Era, which is a collection of multiple schools of thought that demonstrate an increased flexibility and support of public participation than the previous synoptic model. Characteristics common to modern public involvement in planning are an emphasis of the political character of planning, plurality in interests of stakeholder groups, and the use of planners to facilitate the desires and needs developed from the planning process (Lane, 2006).

Challenges surrounding public involvement continue to exist in modern planning. Arnstein (1969) describes the complication of public participation in planning as the paradigm of citizen participation versus citizen control. Because of the perceived change in responsibilities from solely expert consultation to public input, a shift in power can create tension and confusion between experts and the community (Sanoff, 2000; Arnstein, 1969). In contrast to the power struggle that can result from public and professional coordination, involvement of the public in early planning has become a tool to gain political support for planning projects and future development (Hansen, 2006; Pendlebury & Townshend, 1999). Because of the mismanagement of the land and the bureaucracy surrounding democratically elected officials, a shift toward the incorporation of public participation is becoming a more socially integral part of the planning process (Creighton, 2005; Sanoff, 2000). By engaging the community, planners, designers and municipalities can begin to form bonds with the people and provide them with a sense of ownership and pride for the project at hand (Pendlebury & Townshend, 1999; Arnstein, 1969).

The debate over how much power to delegate to the participating community (Arnstein, 1969), or how much real effect the public can have on planning projects still lingers among researchers (Lane, 2006; Kaplan & Kaplan, 1989). Hansen's (2006) research of community influence on public economic development suggest that expert knowledge is still held in high regard, and that interests of elite members of the community, like business owners, community leaders, and governing officials, have significantly more influence than the goals and desires of the general public (Hansen, 2006). In Arnstein's (1969) ladder of citizen participation, the rungs of the ladder represent the degrees of citizen power and demonstrates how power is shifted as the planning process moves forward. Although valuable to recognize the shift in control from public to planning experts, the idea that participation is defined by power in decision-making overlooks the influence of public consultation throughout the planning process (Lane, 2006). This eludes to the concept that public participation in planning is designed to be collaborative evolution of ideas between these two entities (Creighton, 2005), not simply a shift in power.

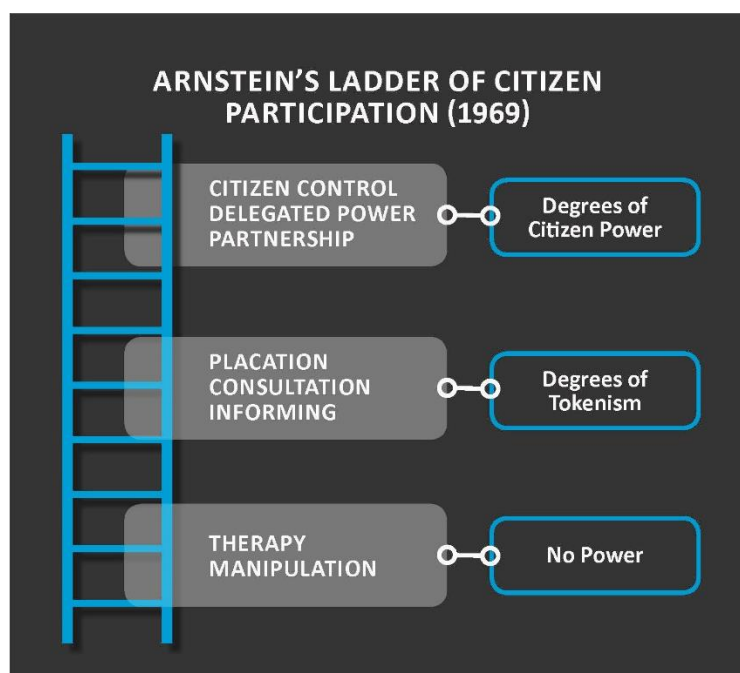


Figure 1. Arnstein's Ladder of Participation (Adapted from Arnstein (1969)).

Challenges in public planning not only occur in the delineation of power, but also arise from basic miscommunication between designers and non-designers. Many times, the public has difficulty describing their desires, likes and dislikes in regards to development, which can result in a fixation of specific details instead of the exploration of broad ideas (Kaplan & Kaplan, 1989). Conversely, designers may overwhelm the public with complicated explanations and their technical knowledge of the project (Creighton, 2005). In Burisch's (1979) study of housing design, he found that there is an instability of personal preference among laymen's judgement, reinforcing the existing literature which concludes that individuals often have differing needs and desires (Sanoff, 2000; Kaplan & Kaplan, 1989; Burisch, 1979; Arnstein, 1969). This gap in communication, along with the presence of multiplicity in desires among individuals, makes it particularly challenging to cultivate productive conversation concerning planning and development projects (Kaplan & Kaplan, 1989, Burisch, 1979), but, as Sanoff (2000) notes, individuals are reasonable and can alter their views when presented with new information and a vision they can belong.

Professional & Non-Professional Evaluation

Designers are responsible for shaping the public realm and guide the development of signage including themes, regulations, construction, placement and form. Historically, expert opinion has been used as the primary source for developing city regulations (Portella, 2014; Pugalis, 2009; Parolek, Parolek, & Crawford, 2008). The debate on how heavily to rely on expert opinion versus public input is principally based on the idea of expert understanding of what regulation would truly represent the desires of the community. Differences in perception do

exist between designers and non-designers, and designers may only have, what Kaplan & Kaplan (1989) describe as, a “limited ability to predict what the public would prefer” (p. 65). Many facets of the exterior environment, like architecture, historic sites and civic spaces, are evaluated differently by designers and non-designers (Yung & Chan, 2013; Pugalis, 2009; Coeterier, 2002; Kaplan & Kaplan, 1989; Cakin 1976).

Notable environmental perception studies by Pugalis (2009) and Coeterier (2002) both found differences between designers and non-designers in their perception of the external environment, but had conflicting results of evaluation criteria considered as significant to each group. In Pugalis’ (2009) study of urban public space, he found that in contrast to the everyday user, designers were predominantly concerned with the aesthetics of urban public space where laypeople perceived social encounters and cultural experiences as more important to the public realm. Conversely, in his research regarding the evaluation of historic sites, Coeterier (2002) revealed that laypeople were more concerned with physical form or aesthetics where professionals concentrated on information, like building age, rarity and completeness. Both studies found differences in perception between designers and non-designers, but the results showed a reversal of evaluation criteria, aesthetics and information, between the two groups. This variation of results may be effected by the change in subject matter evaluated between the two studies, but it is necessary to recognize that there are discrepancies on how these two groups evaluate the environment.

Although, there is considerable support for the notion that designers and non-designers perceive the environment differently, the degree to which these differences effect perception is not well defined. Several of the studies previously cited in the text observed both similarities and

differences of evaluation criteria between designers and non-designers (Yung & Chan, 2013; Pugalis, 2009; Coeterier, 2002). Research by both Yung & Chan (2013) and Gjerde (2011) describe the evaluation between professionals and laypeople as slightly different, eluding that there are statistically significant differences in perception but that these dissimilarities may not be substantial. Studying social, economic and aesthetic variables, Yung & Chan (2013) found that both designers and non-designers identified architectural merit as significant criteria for evaluating historic buildings. Although this variable was identified as significant by both groups, architectural merit was considered the most significant criteria to laypeople, while cultural identity was ranked first by built environment professionals (Yung & Chan, 2013).

Like Yung & Chan (2013), Gjerde (2011) found that designers and non-designers largely perceive urban street scenes similarly. Significant differences were found not specifically in perception, but in the strength and conviction with which designers voiced their thoughts in contrast to laypeople. Previous research of perception comparing designers and non-designers many times focuses on singular objects or buildings. Gjerde (2011) speculates that by studying the urban environment as a whole, similarities between these two groups may be more apparent.

In contrast to other environmental perception research that compares designers and non-designers, Adrianna Portella, in her recently published book *Visual Pollution* (2014) found commonalities between users in perception across professions. These conclusions are consistent with Crawford, et al. (2015), in which thirteen stakeholder groups were compared, including planning/design professionals. While these results vary from some of the literature presented above, both research by Portella (2014) and Crawford, et al. (2015) are the only studies found to

measure the perceptions of planning and design professionals in relation to commercial sign controls. These studies, like Gjerde's (2011) research of urban streetscapes, are also on a streetscape level. Because the external environment is comprised of numerous facets, it is a possibility that signscapes could be a distinct variable within the environment that is evaluated similarly between designers and non-designers.

On-Premise Commercial Signage

Signs are part of the public realm and influence human interaction with the environment. They guide transportation, communication and influence visual quality. Commercial signs advertise a business and are a necessary part of the economic development and survival of an establishment (Rexhausen, Hildebrandt, & Auffery, 2012; Stotmeister, 2013; Taylor, Sarkees, & Bang, 2012; Alford, 2011). Commercial signage is a low budget, cost effective form of marketing in comparison to advertising through television, radio or print (Alford, 2011). They reinforce brand identity and communicate to potential customers the location of an establishment and the types of goods or services which may be provided (Taylor, 2011).

On-premise commercial signs are signs located on the site of the same business in which the sign promotes or advertises for (Kieffer, 2001). This includes, but is not limited to, building mounted signs, electronic message centers, pole signs, pylons, roof signs, animated signs, ground signs and window signs. Simply put, an on-premise commercial sign is any sign that advertises for a business which is located on the same premise of that business. Way-finding signs are signs that direct users to a given destination, like traffic, street, and directional signs (Kieffer, 2001). Unlike way-finding signs, because on-premise commercial signs are located on

private property, they offer their own sets of challenges in regards to traffic and safety (Garvey & Crawford, 2015). Understanding sign characteristics that provide motorists with clear communication to ensure safety is a strong contributing factor to the regulation of on-premise commercial signs (Garvey & Crawford, 2015; Jourdan et al., 2013).

Over the last hundred years, on-premise commercial signs have advanced in design, use and technology. As the public realm shifts, these signs adapt to new environments and changing civil sign controls. In Jeffery Meikle's (2013) analysis of Martin Treu's (2012) book *Signs, Streets, and Storefronts: A History of Architecture and Graphics Along America's Commercial Corridors*, Meikle begins to identify the major themes in Treu's text. He notes major influences for these developments in sign evolution that can be traced back to architecture, electricity, the introduction of the automobile and paradigm shifts in streetscape character (Meikle, 2013).

At the turn of the twentieth century, ornate architecture lined the streets of many downtowns and the space necessary for large signage was unavailable to storeowners at that time. Consequently, small projecting signs located at a human scale were frequently the only use of on-premise commercial signage. Electricity revolutionized commercial signage in the early 1900's. With the use of electricity becoming more prevalent, businesses began to use light to attract customers. Incandescent bulbs became a popular medium to create designs and words, acting as a new form of advertising. Electrically lit signs created competition among businesses for attention and quickly altered traditional American streetscapes. The perceived chaos created by these new signs resulted in a push toward regulation of signage with justification rooted in both public safety and posterity (Meikle, 2013).

In the 1920's and 30's, the growing presence of automobiles greatly influenced both signs and architecture. New types of buildings, like gas stations and drive-in restaurants, were developed to accommodate motor vehicles. Signs became more auto-oriented and architecture became more like signs themselves. In the mid 1900's, the modernization of downtowns began, and the development of suburban shopping centers promoted the use of large scale signs for automobile oriented areas. Since the 1960's, the debate over exceeding regulation has been a prevalent issue in sign law. This conflict is reflected in the debate between the preservation and renovation of signage within downtowns. The question to replace non-conforming signage with signs consistent with new design and regulation, or to protect signs from different eras in order to preserve history and represent an authentic signscape is a dialog that still continues today (Meikle, 2013).

Commercial Sign Controls

Signs are information. They are branded with text, symbols, logos, and shapes providing users direct communication relating to wayfinding and advertising. Signage controls are in place to ensure visibility of traffic, keep unnecessary distractions off of streetscapes, and to warrant quality construction and implementation of these structures in order to protect the public (Garvey & Crawford, 2015; Jourdan et al., 2013; Strauss, Jourdan, & Weinstein, 2014).

On-premise signage, or signs found on the location of an establishment, have been linked to economic success of a business; however, there is a lack of empirical evidence supporting the policy that governs these on-premise signs. Misguided regulation of on-premise commercial signage can occur because of the misunderstanding of the value that these signs have on the

visual landscape and the economic welfare of a business (Taylor, 2011). Since the early 1900's the regulation of signs has been allowed on the grounds that policy protects the health, safety, and general welfare of a community (Jourdan et al., 2013). Zoning regulations and form-based codes are a legal documents that municipalities use to guide the physical development of land. Traditionally, sign controls have been governed by a municipality's zoning ordinance, but alternative forms of sign controls can be found in other municipal regulations such as form-based codes (Parolek et al., 2008).

Freedom of Speech

Signs are a form of communication, and an expression of free speech. Therefore, commercial signs are supported under the first amendment of the United States Constitution which protects the freedom of expression. This law states:

Congress shall make no law respecting an establishment of religion, or prohibiting the free exercise thereof; or abridging the freedom of speech or of the press; or the right of the people peaceably to assemble, and to petition the Government for a redress of grievances (The Constitution of the United States, 2013 p. 1059).

Commercial free speech has existed in the United States since the 1880's, but it wasn't officially recognized until 1975 when, in the court case *Bigelow v. Virginia*, the protection of free expression was extended to corporations (Cavanagh & Varma, 2014). In the words of Supreme Court Justice Powell "Speech does not lose its constitutional protection simply because it appears in a commercial context (The Constitution of the United States, 2013 p. 1248)." Although, amended in the 1980's, the courts declared that commercial free speech was to be provided with only moderate protection in contrast to constitutionally guaranteed expression,

like non-commercial free speech (Cavanagh & Varma, 2014). In 2010, the Supreme Court case Citizens United v. FEC established that because corporations are associations of individuals, they are entitled to protection under the first amendment right of free speech. This recent ruling has now given corporations greater protection of commercial free speech than previously established (Strauss et al., 2014; Cavanagh & Varma, 2014).

Because signs are protected under the first amendment, sign law needs to be justified by serving the greater good of a community. As stated in the 1975 ruling of Bigelow v. Virginia “advertising, like all public expression, may be subject to reasonable regulation that serves a legitimate public interest (Cavanagh & Varma, 2014 p. 101).” Sign laws were created to protect the health, safety and welfare of the public, but modern sign policies may be overreaching in their scope and sign regulation is often based on undocumented visual preferences instead of empirical research (Strauss et al., 2014; Jourdan et al., 2013; Kinoshita & Orlando, 2013; Taylor, 2006). Extreme sign controls can be counterproductive, devaluing the importance of signage to consumers by restricting a sign owner’s right to free expression (Taylor, 2006). To counter the legal issues facing non-evidence based sign policies, Jourdan et al. (2013), in their study *Evidence-Based Sign Regulation*, proposed a version of the model sign code developed by Urban Design Associates as an easy to understand, mathematical tool which can provide fair regulation to sign law. Although this guide begins to apply empirical data on readability and visibility to sign controls, it lacks a comprehensive solution. There are many complications created by not having data supported sign codes, which leaves gaps for further research and discussion.

Zoning Code

Traditional Euclidean zoning, also known as single use zoning, was adopted in the U.S. during the early 1900's. Conceptualized from German zoning regulation, which was developed for the preservation of natural environment from urban development and industrial uses, zoning in the United States grew from the Model Zoning Act. The Model Zoning Act was developed by the Department of Commerce in 1920 as a way to decrease density in urban space and divide residential uses from the pollution of industrial sites in order to protect the health, safety and welfare of the general public (Liebermann, 2002; Department of Commerce, 1926). Euclidean zoning divides the land into separate uses, or zoning districts. These districts are typically comprised of a single use, dividing the land into residential, commercial, industrial, recreational, and agriculture districts. In modern zoning regulations, these districts are much more specific, and describe particular uses like light industrial, low density residential, commercial agriculture or downtown general business.

Zoning regulations are comprised of a Code of Ordinance, which are typically extensive written texts that address laws and regulations specified within zoning districts. A Zoning Code of Ordinances is often laden with technical terms and can be difficult to interpret for those not familiar with municipal law or planning (Jourdan et al., 2013). Because of the distinct separation of uses and technical difficulty associated with zoning codes, these types of regulations have been criticized for their tendency to hinder progress of new business owners, developers and entrepreneurs (Liebermann, 2002; Parolek et al., 2008).

Zoning codes that govern signs are based on zoning districts (Jourdan et al., 2013). These codes determine height, luminosity, sign type, placement and other aspects related to signage (Jourdan et al., 2013). Because signage in a zoning regulation is influenced by land use, design

can be limited partially due to the lack of overlap between zoning districts. Another part of this limitation to design stems from a fundamental flaw of zoning codes, which is their reactionary nature. Zoning codes lack guidance for developing commercial signage and instead provide strict boundaries that focus on what is not permitted for design. This reactionary nature can lead to difficulty in creating signs that meet regulation and can produce an inconsistency in form and character within signscapes.

Form-Based Code

For the first time since World War II, the United States has seen a decrease in suburban and exurban population growth (United States Department of Agriculture, 2015). In the US, populations within cities, or incorporated places, has increased by nearly 14% between 2000 and 2013 with large cities of 500,000 to 999,999 people growing at the fastest rates in the country (Cohen, Harchard, & Wilson, 2015). Populations in urban centers across the United States are growing, increasing the demand for high density, multiuse structures and spaces within cities and downtowns, which can be difficult to accommodate with traditional zoning regulation (Cohen et al., 2015; Liebermann, 2002). Developed in 2004 by a group of professionals in the fields of architecture, urban design, planning, environmentalism, and land use law (Form-Based Codes Institute Staff, 2013), form-based codes emerged as an alternative to traditional zoning, relating the forms of the built and natural environment in an effort to encourage economic growth and combat urban sprawl through creating sustainable, walkable, and high quality environments (Parolek et al., 2008).

The term Form-based Code was recently defined in 2001 in by Carol Wyant as a result of a presentation describing the graphic or typological coding technique that she and her

colleagues were presenting to the City of Chicago (Form-Based Codes Institute Staff, 2013). This type of regulation addresses the relationships between the built and natural environment, using form and function to guide policy. This idea has been used in design for centuries, but has only recently been defined and characterized, gaining support from many planners and groups like the New Urbanists (Parolek et al., 2008).

All form-based codes are a type of graphic or typological coding. These codes are described using simple text with clearly drawn diagrams, definitions and additional visuals that support the intended character created by that specific code (Form-Based Codes Institute Staff, 2013). These characteristics make form-based codes particularly user friendly and act as flexible guide for designing commercial signage (Form-Based Codes Institute Staff, 2013, Parolek et al., 2008). The objective for both a zoning and form-based code is to organize signage in a way that promotes health, safety, and general welfare, but they differ in application and the predictability of the manifestation of the code (see *Table 1*).

Table 1. Key Differences of Zoning & Form-based Code Regulation (adapted from Parolek et al. (2008)).

Key Differences of Zoning & Form Based Code Regulation	
Conventional Zoning Codes	Form-Based Codes
Use is primary	Physical form and character are primary
Segregated Land-Use	Mixed use
Auto-Oriented	Walkable and compact development-oriented
Organized around single-zones	Reinforce and urban hierachy (e.g., rural-to-urban transect)
Reactive to individual development	Proactive community visioning
Regulates to create buildings	Regulates to create places
Proscriptive regulations: Regulates what is not permitted	Prescriptive regulations: Describe what is required

Perception of Commercial Signage

Studies related to the perception of urban space have been observed for quite some time. The Social Cognitive Theory and the Probabilistic Lens Model are both theories that suggest alterations in surroundings, both social and environmental, may encourage behavioral or perceptual change (Brunswik, 1952; Communication for Governance and Accountability Program, 2010). Environment and perception has been studied extensively by notable researchers in the fields of planning and design, such as Kevin Lynch (1960), William H. Ittelson (1978), Rachel Kaplan (1985), Jan Gehl, and Birgitte Svarre (2013). In relation to the Michigan State University online resource search, studies concerning this topic started in 1915 and kept relatively steady until 1969, where there was a small rise in research. Published research gradually began to grow until mid-1990, where there was a considerable increase in related material, and the topic continued to develop exponentially until 2012. Since then, the published research related to perception of urban space has begun to decline, but still has a strong presence in the field of environment and behavior.

Research that examines signage in relation to user perception focuses on signs in both interior and exterior spaces, wayfinding, on-premise signs, and commercial signage (Crawford et al., 2015; Portella, 2014; Bai, Finger, & Yue, 2009; Vanderbona & Yossayaffra, 1999; Nasar & Hong, 1999; Werner & Kaminoff, 1983). Like Jeffery Meikle (2013) recognizes the development and changing use of signs within the urban landscape, more recent literature suggests a change in perception of signscapes as well (Berger, 2014). Berger (2014), in his study *Signs and The Downtown Experience*, discusses the adjustment of attitudes toward signage over the last decade, which correlates with trends observed by Meikel (2013) in the history of commercial

signscapes described earlier in the text. This includes greater acceptance for largescale landmark signs and the integration of signage into architecture, seeing signs as not just a form of communication, but as part of community identity, branding and architectural form (Berger, 2014).

This development in perception of signage indicates the constant need for study in this field. In contrast to Berger's (2014) research, the seventeen year old study *Visual Preference in Urban Signscapes*, by Hong & Nasar (1999) shows the modification in perception in urban space. Nasar & Hong's (1999) primary finding was that streetscapes can be improved by reducing sign obtrusiveness. In this study, the respondents preferred less-obtrusive signscapes and saw these places as more interesting, legible, and as desirable places to visit (Nasar & Hong, 1999). While this may hold true in suburban and rural landscapes, Berger (2014) found that signage located in downtown environments were more positively perceived when signs were very flashy and there was increased diversity within the signscape.

One unchanging aspect within the study of signage perception regards the primary function that signs provide, communication. In nearly all of the literature reviewed pertaining to signage perception, a positive correlation between sign communication and legibility has been found (Portella, 2014; Berger, 2014; Nasar & Hong, 1999; Vanderbona & Yossayaffra, 1999; Werner & Kaminoff, 1983). In addition to increasing efficiency of directional movement (Bai et al., 2009), clear signage can have a positive impact on perceived crowding and reduce feelings of confusion (Werner & Kaminoff, 1983). This reinforces the justification for sign controls that regulate placement, scale, and the organization of signs. Clarity in sign communication is not only regulated to protect the health and safety of the people by reducing traffic hazards and

driving distractions, but also as a tool to increase aesthetic perception of the entire signscape (Portella, 2014).

In Adrianna Portella's (2014) book, *Visual Pollution*, the author studied perceptions of commercial signage in historic downtowns across cultures to find universal or distinct preferences. This research analyzes advertising, signage and environmental quality and begins to define factors of beauty, interest, and order that support an aesthetic signscape. Portella's work found common perceptions of signage across cultures and professions, and an increased positive perception for historic city centres that had sign regulations in place. Crawford et al. (2015) study on stakeholder perceptions of commercial sign controls also found universal perceptions of signage regulations in non-historic areas consistent with Portella's (2014) results. Both Portella (2014) and Crawford et al. (2015) identified connections between user preference and sign controls, providing a foundation for future research.

Conclusion

Themes from the previous research suggest a growing need for cooperation and understanding between designers and non-designers to aid in the development of successful urban places through public participation. Although studies concerning the perception of designers and non-designers have varying results, literature that specifically addresses perceptions of on-premise commercial signage found common perceptions between professionals and laypeople. As noted previously, Gjerde (2011) suggests that designers and non-designers largely perceive urban street scenes similarly, meaning signage may simply be a single variable within that urban landscape.

Signage can bring clarity, increase efficiency and alter the perception of a place. It is apparent that signage effects perception, understanding and behavior, but can the alteration of sign regulation also influence perception? Because commercial signs have an impact on visual quality, and sign codes influence the physical characteristics and placement of commercial signs, it is conceivable that sign regulation could have the ability to impact visual quality and perception. The question is, do these perceptions vary based on knowledge and training in the planning and design fields or do designers and non-designers perceive these signscapes similarly? By bridging the gap between client and planner perception of on-premise commercial sign regulations, this research will have the potential to aid in the development of more universal commercial sign regulations.

Conceptual Framework

The conceptual framework used for this study was developed through the literature review. *Figure 2. Conceptual Framework* represents the diagrammatic framework for this research, which identifies key variables and relationships pertinent to the research question. The area of study, perception of on-Premise commercial sign codes, is displayed in the thought balloon above two figures, who represent designers and non-designers. The three signage codes being studied are outlined as zoning code, form-based code, and no code. Beauty, interest, and order are identified as indicators, which are used to measure the perceptions of the designers and non-designers concerning on-premise commercial sign codes. These aesthetic indicators have been defined by the author based on design literature and educational training.

Beauty: Qualities of physical form evoking a positive response or feeling correlated to attractiveness.

Interest: A visually stimulating character that activates and engages the senses.

Order: The harmonious arrangement of parts in a consistent or rhythmic pattern.

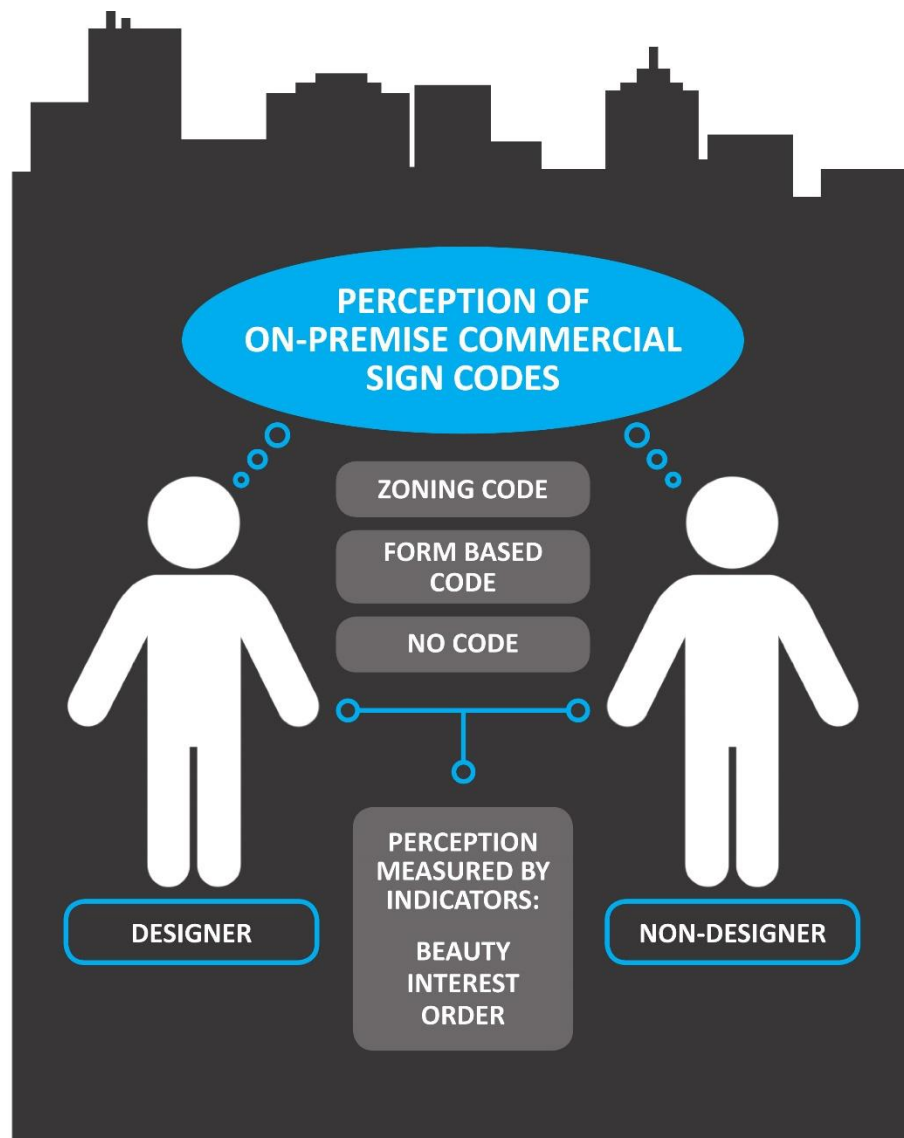


Figure 2. Conceptual Framework

Research Question

A series of associated sub-questions have been developed to aid in the understanding of the central research question. The central research question has been defined as:

Are there differences in perception of on-premise commercial sign regulations between designers and non-designers?

The associated sub-questions are as follows:

RQ1: Is there a significant difference in perception of beauty, interest, and order in the **no code** sign models between designers and non-designers?

RQ2: Is there a significant difference in perception of beauty, interest, and order in the **zoning code** sign models between designers and non-designers?

RQ3: Is there a significant difference in perception of beauty, interest, and order in the **form-based code** sign models between designers and non-designers?

Chapter 3: Methods

The methods chapter of this text outlines the research goals and central question, which set the foundation for this thesis. Because of this study's cross-sectional time dimension approach, a detailed background regarding the research site is provided. As a systematic non-experimental design, the sections that follow discuss the rationalization behind the research design, development of models, methods of data collection, and analysis of both qualitative and quantitative statistics.

Research Goals

As discussed in the previous chapter, this research aims to identify the gap between designer and non-designer perception of on-premise commercial sign regulations. By developing a greater knowledge platform about the perceptions of designers and those who they are designing for, this research can strengthen the understanding of aesthetics, streetscapes, and signage, providing empirical justification for signage controls and that in the development of more universal commercial sign regulations.

Research Site

[The sub-section Research Site was copied with permission from Current Urban Studies – See Appendix A]

The study area includes a portion of the Greater Lansing area, which is centrally located in the Michigan Lower Peninsula. Both the City of Lansing and East Lansing are included in the research site (see [Figure 3]). The City of Lansing is home to Michigan's capital and

approximately 113,996 residents. The 36.68 square mile city supports many industries including health care, public administration, educational services, and construction (City Data, 2012). With a 7.3% unemployment rate and a median household income of \$33,514, the economic standing of the City sits just below the state average (City Data, 2012; United States Bureau of Labor Statistics, 2014). The City has adopted the Design Lansing Comprehensive Plan, as well as being selected by the Environmental Protection Agency (EPA) to be part of the Greening America's Capitals initiative in an effort to bring positive change to the area (City of Lansing, 2012).

US-127 Highway divides Lansing from nearby East Lansing, another section of the Greater Lansing study area. East Lansing is small, both in area and population. The city occupies an area of 13.67 square miles with an approximate population of 48,518 (City Data, 2012). Because East Lansing is the home of Michigan State University, the student population fluctuates greatly during the school year. While the unemployment rate in East Lansing is a little lower than the City of Lansing, the median household income is lower as well. Educational service is the dominant industry in the area, followed by accommodation and food services, healthcare and social assistance (City Data, 2012).

The Greater Lansing area is connected by many natural features and thoroughfares, but the Grand River/Michigan Avenue corridor is a primary artery linking the City of Lansing and East Lansing. This study concentrates on [three] nodes along this artery, spanning from downtown East Lansing to the State Capital. [Figure 3] presents the locations of the [three] study nodes on Grand River/Michigan Ave. in Lansing and East Lansing. [Figures 4, 5, and 6 present] the present streetscapes of node 1 through node [3] with current signage code application.



Figure 3. Greater Lansing Research Site and Study Nodes



Figure 4. Node 1: East Lansing Existing Conditions



Figure 5. Node 2: Lansing East Michigan Ave. Existing Conditions



Figure 6. Node 3: Downtown Lansing Existing Conditions

Research Design

This study uses a mixed methods research design in an effort to strengthen the results. All studies have limitations, and by using a concurrent mixed methods research strategy, limitations of both quantitative and qualitative methods can be minimized (Lee, 2014a). This research design is appropriate for the intended method of data collection because it provides tangible statistical data through predefined questionnaire answer choices with a portion of open ended questions allowing for participants to elaborate on their perceptions more clearly.

The pragmatism paradigm corresponds with this research design because of its pluralistic, real world approach. Pragmatism is often described as a worldview that focuses on “what works” (Morgan, 2014). The concept behind pragmatism is that reality is more than a construct, but, like David L. Morgan (2014) states in his work *Pragmatism as a Paradigm for Social Research*, “it is ever changing based on our actions.” This worldview connects well with the intended research because of its cross-sectional time dimension and real world application, providing explanation for the reality of the user’s perceptions at a specific time and place.

The area of study is located in the Greater Lansing Area, Michigan, and includes a portion of the Michigan Avenue streetscape that spans an approximate length of 3.8 miles. The study area extends over two municipalities, the City of East Lansing and the City of Lansing, and continues from East Lansing to Downtown Lansing. Three study nodes reflecting a downtown character have been selected along this stretch of road. This thesis uses an in-situ approach to studying the perceptions of designers and non-designers, where the three study nodes along the Michigan Avenue corridor are taken from their original state and modified to create new models with differing sign code applications. Through the use of a survey, the study is able to elaborate on and quantify user perceptions of model streetscapes with varying signage codes using both open and close ended questions.

Study Node Model Development

To gauge the perceptions of respondents, the survey used images of models to prompt a response. In the section of the survey, *Perceptions of Model Streetscapes with Different Sign Code Applications*, participants were asked to rate six streetscape models based on three indicators: beauty, interest and order. Two models were created for each of the three study nodes using a no code zoning sign code, or a form-based sign code application, to produce six images in total. Each of the six streetscape images were rated by participants on three, five-point Likert scales that separately measured beauty, interest and order. Open ended answer boxes were provided for each of the six streetscape images to allow participants to elaborate on their perceptions more clearly.

The six images used for this study were created using the 3D modeling program SketchUp. This method of image development was chosen to represent both the existing zoning sign code applications, and the theoretical form-based and no-code sign applications. Because the images in this study represent specific locations with differing theoretical sign code applications, photographs could only be obtained for the existing zoning sign code application. To produce viable images representing all three sign code applications, SketchUp was selected as the best platform for developing accurate models. Research from Partin's (2011) study, *SketchUp Validity Modeling: A Comparison between Photographs and 3D Models*, suggests SketchUp as a valid tool to gauge participant perceptions of the environment. For clarity purposes, the image models produced for this survey are shown in a black and white and in line form. Because the sign codes in this study focus on sign form and arrangement within the streetscapes, the variable color was not used for this study as it was deemed a possible distraction from the study focus.

The sign code applications used to develop the model images were based on the existing zoning sign code the Greater Lansing Area, Michigan and the theoretical form-based code of Casper, Wyoming. By using existing streetscapes with existing codes, the study could ensure the accuracy of the code applications when developing the model images. The Casper, Wyoming Old Yellowstone District Form-Based Code was chosen to guide the design of the alternative from-based code models because of the city's comparable size to Lansing and the established focus of Casper's code on a downtown streetscapes. The no-code sign applications was developed by using only non-conforming signs under the existing sign regulations. Detailed descriptions of each model development are illustrated below.

[The Node descriptions found in the sub-section Study Node Model Development were copied with permission from Current Urban Studies – See Appendix A]

Node 1: East Lansing The signage in Node 1 is governed by East Lansing’s zoning code and is zoned as a C parcel. Chapter 32 of the City of East Lansing’s code of ordinances outlines the code governing signs along with three additional regulations (East Lansing, 2014). The existing sign code in this area seems to be well enforced with few signs in poor condition. The bulk of non-conforming signs include electronic message centers (EMC). This is due to the recent passing of a sign ordinance which put a ban on these specific signs. All of the grandfathered EMC signs that have been cataloged seem to be fairly new and in good condition. [Two streetscape models for Node 1: East Lansing were created. A zoning code sign model, representative of the existing conditions, and an alternative no code sign model. In *Figure 7* the zoning code sign model is shown on the left, and the no code sign model is shown on the right.]

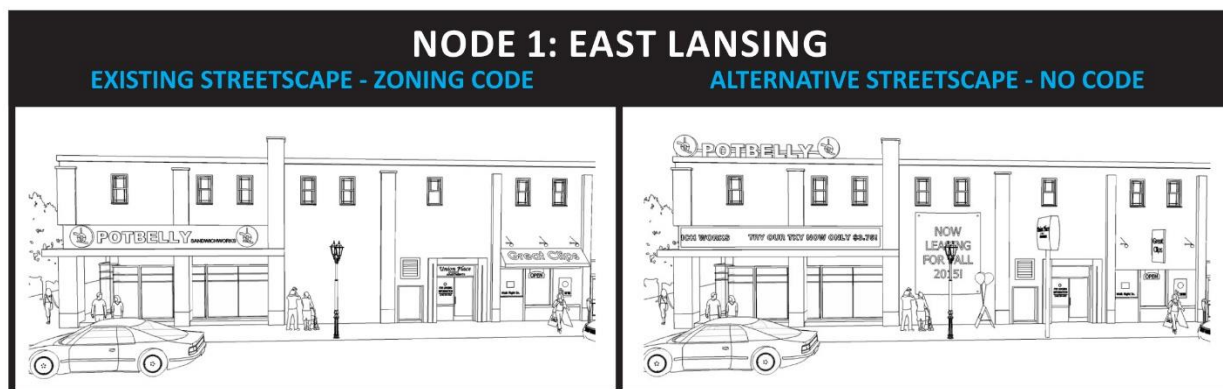


Figure 7. Node 1: East Lansing Sign Code Models (Adapted from Crawford et al. (2015)).

Basis for alternative streetscape model: No Code Sign Application

- EMC sign was added to Potbelly – This sign type would not be permitted under the existing sign code.

- Roof sign was added to Potbelly – This sign type would not be permitted under the existing sign code.
- The temporary “Now Leasing” banner was placed, visually filling up the space between Potbelly and the Union Place, also giving Union Place more of a presence.
- A sandwich board was added with balloons to catch attention – Temporary, moving or lit objects, like balloons, would not be permitted under the existing sign code.
- Pole and panel sign was added along the street. This increases visibility along Grand River Ave. The perpendicular orientation of the sign can be seen from a distance down the street – This sign type in combination with the sign’s proximity to the building would not be permitted under the existing sign code.
- Great Clips awning was removed and replaced with a projecting sign, increasing visibility for two way foot and auto traffic – This sign type would not be permitted under the existing sign code.

Node 2: Lansing East Michigan Ave. The signage in Node 2 is governed by the City of Lansing zoning code and is zoned as an F-1 parcel for commercial use. Zoning regulations governing signs in this node can be found in the City of Lansing Zoning Ordinance part 14, and is supported by a variety of permit applications and informational web pages on the City of Lansing’s website (Lansing, 2014). The existing sign code does not seem to be well enforced in this area. Many signs are in poor condition and there are several instances of non-conforming signs along Michigan Avenue. The Lansing East Michigan Avenue node has the dynamic of a neighborhood downtown and is accessible to both vehicular and pedestrian traffic, but is less traveled by foot. [Two streetscape models for Node 2: Lansing East Michigan Ave were created.

A zoning code sign model, representative of the existing conditions, and an alternative form-based code sign model. In *Figure 8* the zoning code sign model is shown on the left, and the form-based code sign model is shown on the right.]



Figure 8. Node 2: Lansing East Michigan Ave. Sign Code Models (Adapted from Crawford et al. (2015)).

Basis for alternative streetscape model: Form-based Sign Code Application

- Based on Casper's Old Yellowstone District Form Based Code.
- Zone 2. Areas coded for this zone are secondary in intensity and are intended to support the bulk of the commercial and business ground floor uses.
- Awning Signs
 - Awnings are limited to first and second floor uses only. Awnings shall be mounted on the building in such a way that they project over individual windows and door openings.
 - Backlit, translucent, internally illuminated awnings are prohibited.
 - Sign are or sign lettering shall comprise no more than thirty percent (30%) of the total exterior surface of an awning. Any graphic logo or text printed on an awning will be counted toward the total maximum allowable sign area.
- Wall Signs

- Wall signs shall not project from the surface upon which they are attached more than twelve inches (12”).
- Wall signs and ghost signs painted directly on a structure are appropriate.
- The maximum total wall sign per façade shall not exceed two (2) square feet per linear foot of building façade length of the wall on which it is to be located. In no case shall total wall signage exceed a minimum of three hundred (300) square feet for any building.
- Window Signs
 - Window signs shall not cover more than twenty five percent (25%) of the area of each window.

Node [3]: Downtown Lansing The signage in Node 4, Downtown Lansing, is zoned as a G-1 parcel for business use (Lansing, 2014). The Downtown Lansing node has the dynamic of a city downtown and is well used by both vehicular and pedestrian traffic. The purpose and intent of the Capitol Center District is to place more restrictive sign regulation on the area associated with the Michigan State Capitol Building. This is a unique area within the State and the City, and has sign regulations that intend to preserve vistas, protect the dignity and enhance the visual cityscape of the Capitol. This area has a variance within the Lansing zoning code that specifically applies to the downtown and is expressed in the City of Lansing Zoning Ordinance- Part 14- Building & Housing Code- Title 4- Miscellaneous Building Regulations- Chapter 1442.23 Capitol Center District (Lansing, 2014). The language in this chapter is reflective of a model form-based code. As stated by the code: Buildings in the capitol center district that are used for a public purpose and are owned or entirely occupied by the United States Federal Government, State of

Michigan or the City of Lansing and any of its Agencies, Departments or instrumentalities are exempt from the dimensional requirements of the code. The Director of the Department of Planning and Neighborhood Development has sole authority to approve or deny signs for these agencies after reviewing the proposed sign's compatibility with the surrounding area and the goals expressed in the code (Lansing, 2014). [Two streetscape models for Node 3: Downtown Lansing were created. A form-based code sign model, representative of the existing conditions, and an alternative no code sign model. In *Figure 9* the no code sign model is shown on the left, and the form-based code sign model is shown on the right.]

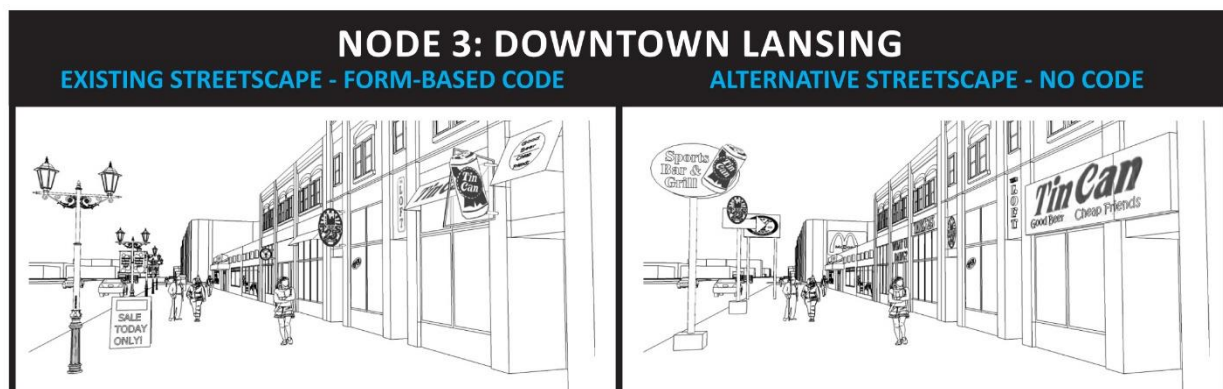


Figure 9. Node 3: Downtown Lansing Sign Code Models (Adapted from Crawford et al. (2015)).

Basis for alternative streetscape model: No Sign Code Application

- Form a generic character, everywhere USA.
- Placement of pole signs along street to attract attention from the heavy motor traffic in this downtown area - This sign type in combination with the sign's proximity to the sidewalk would not be permitted under the existing sign code.
- Large-scale billboard advertisement was placed in the distance - This sign type would not be permitted under the existing sign code.

- The awning and projecting signs have been replaced with wall mounted signs, 3D lettering and cabinet signs.
- The scale of the building mounted signs was increased to attract attention from the heavy motor traffic in this downtown area.
- The enlargement of text increases visibility - This text scale would not be permitted under the existing sign code.
- Removal of sandwich board.

Perception Indicators

Beauty, Interest, and order were used as indicators to gauge participant perception of the model streetscapes. Identified in previous research studying perception of designers and non-designers (Gjerde, 2011; Coeterier, 2002), environmental evaluation (Ewing & Clemente, 2013), and signage perception (Crawford et al., 2015; Portella, 2014; Nasar & Hong, 1999), these indicators have been selected as suitable measures to evaluate perceptions of the sign code model images presented in the survey. Stated by Portella (2014) “Aesthetic judgements are based in feelings” and are “linked to physical characteristics of the built environment (p. 18).” In recent research by both Portella (2014) and Crawford, et al., beauty, interest and order were studied as factors to determine user perception of commercial signage. These indicators have been found as measures of preference in other related research. In Coeterier’s (2002) study of laypeople’s perception of historic sites, beauty was studied as a secondary design criteria and results showed interest to enhance positive perception. Both Nasar & Hong (1999) and Gjerde (2011), in their research of urban environmental evaluation studied interest and order to

measure perception. Gjerde's (2011) continues to state that "the two most important formal factors affecting judgement are order and visual interest (p. 155)." Because of the support from the existing body of research, it was concluded that all three indicators, beauty, interest and order, would be valuable tools to measure participant's perception of the sign control models.

Participants

The theoretical population generalizes user groups of signs, including individuals who are and are not familiar with signage or sign controls. To participate in the survey, the sample population was required to be adults who were at least 18 years of age, including a mix of non-local and local Greater Lansing Area residents.

Participants self-identified their user groups from a pre-developed list of stakeholder affiliations. The study group non-designers identified themselves as home, business and rental property owners, students, developers, institutional and government affiliates, and sign manufacturers, which were later combined into a singular group. The study group designers self-identified as planning/design professionals. Additional demographic identifiers such as age, gender, and education have also been used to properly determine if the participant group is comparatively representative of the general population.

The sample population includes participants of all the intended stakeholder groups listed above, where 43% of the respondents were categorized as designers and 54% as non-designers.

A convenience snowball sampling strategy was used to contact hard to reach populations (Lee, 2014b), like planning/design professionals, which were intentionally sought after for this

study. By utilizing the benefits of an online administered web survey, this sampling strategy provides a low cost, time efficient way to gain access to sample populations.

Data Collection

As a systematic non-experimental design, this study employs the use of an online administered web questionnaire using SurveyMonkey.com as the data collection platform. Through survey research, the study collected numeric and textual data for the attitude and opinions of the sample population. Because of the low rate of response found in online web surveys, a snowball effect was used to reach possible participants (Lee, 2014b). This sampling strategy provides a low cost, time efficient way to gain access to specific sample populations, like planning/design professionals.

The survey questionnaire was submitted and received approval by the Michigan State University Institutional Review Board (IRB) of Human Subject Protection Program, IRB #14-159. The online web survey was distributed on July 16, 2014, post IRB approval, and was kept open until August 5, 2014.

To increase the rate of response, email invitations to the online survey were distributed through both the Signage Foundation Inc. and the Michigan State University Land Policy Institute's organizational listservs. Other methods of contact included posting an announcement with a link to the web survey on the Signage Foundation Inc. and the International Sign Association websites as well as the American Society of Landscape Architects, the ASLA Women in Landscape Architecture PPN and the Michigan State University Landscape Architecture Club's LinkedIn and Facebook web pages. Other possible participants were contacted electronically

through the Environmental Design Research Association, Michigan Avenue Development Authority, Michigan Avenue Homeowners Associations, the Michigan State University Center for Community & Economic Development, and the Healthy Home Coalition.

Instruments

The survey was distributed electronically. SurveyMonkey.com was used to access the online questionnaire and to collect raw data. The survey included both open and close ended questions in the form of, multiple choice, interval, semantic differential and opinion based textual questions (see Appendix B for survey questions and layout). The survey was designed by the author as part of a greater research project, partially funded by the Signage Foundation Inc. The sections of the survey used for this thesis include (1) Perceptions of model streetscapes with different sign code applications and (2) Demographics.

Perceptions of model streetscapes with different sign code applications used model streetscape images to measure the perceptions of three different sign regulations. Pairs of SketchUp models representing the same streetscape with either a form-based sign code, zoning sign code, or a no sign code application were presented to participants. Each image was evaluated by participants using five-point semantic differential scales that rate the level of beauty, interest, and order. Additionally, open ended questions about the positive and negative characteristics of the commercial signage allowed respondents to elaborate on their perceptions. Considering order effect, the pairs of models were randomly presented in the survey.

The paired streetscape models for the section Perceptions of model streetscapes with different sign code applications are:

Table 2. Paired Streetscape Models

Paired Streetscape Models	
Node 1, East Lansing	
	Existing Zoning Sign Code Application
	Alternative No Sign Code Application
Node 2, Lansing East Michigan Ave	
	Existing Zoning Sign Code Application
	Form-based Sign Code Application
Node 3, Downtown Lansing	
	Form-based Sign Code Application
	No Sign Code Application

The Demographics section of the survey inquired about participant background using predefined multiple choice answers to indicate age, gender, major stakeholder affiliation, and education.

The Signage Foundation Inc. review board participated in the vetting process and pre-test of the questionnaire. Revisions were made per their expert opinion. These revisions included a link to skip a section of the survey that did not pertain to all survey participants, the elimination of questions that inquired about the function of commercial signage, and the replacement of some dichotomous questions with semantic differentials or Likert scales. The survey was distributed post approval from the Signage Foundation Inc. review board.

Data Analysis

Both the qualitative and quantitative data analysis began after the scheduled August 5, 2014 end date. The raw data was downloaded from the SurveyMonkey website in the formats of IBM-Statistical Package of SPSS and Microsoft Excel. After the data was cleaned, the quantitative data was analyzed through SPSS using One-Way Analysis of Variance (ANOVA) tests. The qualitative data was transcribed into word clouds using the applet Wordle.

Participant socio-demographic statistics was evaluated through quantitative descriptive statistical analysis. The section *Perceptions of model streetscapes with different sign code applications*, was analyzed using both quantitative and qualitative techniques. For the five-point semantic differential scales rating perception, a one-way ANOVA was to examine the differences in perceptions between designers and non-designers in relation to the indicators beauty, interest, and order. Additionally, a one-way ANOVA test will was to find the differences in perception between designers and non-designers for the zoning code, form based code and no code sign applications. This allows for the research to look at both the study group's broad perceptions of the sign code models as well as the differences in perceptions of indicators for each code application. Because the indicators beauty and order are on an inverse scale throughout the survey, where lower scores indicate higher levels of beauty and order, these indicators were transformed in SPSS to reverse their coding in order to achieve a consistency of mean descriptions within the results chapter. The qualitative employed the use of the applet Wordle, which uses an algorithm to measure the frequency of words collected from the open-ended questions. The qualitative data was reserved as supplemental data presented in the discussion chapter.

Chapter 4: Results

Presented in this chapter are the findings and results gathered through the online survey questionnaire used for this thesis. Respondent socio-demographic characteristics and participant ratings of indicators beauty, interest, and order for the no code, zoning code, and form-based code sign models are examined through statistical methods of analysis. The purpose of this chapter is to answer the central research question and associate sub-questions previously stated in the literature review. Results of the data analysis are presented in both a textual and numeric manner.

Participant Profiles

Respondent socio-demographic information is displayed in *Table 3*. A total of 207 participants entered the survey and 196 respondents answered the first question pertaining to stakeholder affiliation. Of the 196 participants who did identify their stakeholder affiliation, approximately 43% were categorized as designers and 54% as non-designers. Between 166 and 149 participants completed ratings of the sign code models, with 128 completing the demographics portion, which was reserved for the end of the survey. Attrition rate increased as the survey continued, where 34% of participants did not complete the survey.

Stakeholder affiliation, age range, gender, and educational attainment comprised the socio-demographic characteristics collected for the survey. Respondents had to be at least 18 years of age to participate. Age groups were similar for the designer and non-designer groups, where, the 50 to 59 age range represented the highest percentage of participants (Designers = 24%, Non-Designers = 29%), followed by the 30 to 39 (Designers = 22%, Non-Designers = 24%)

and the 18 to 29 year old groups (Designers = 22%, Non-Designers = 16%). The other age groups, 40 to 49, 60 to 69, and 70+, represented 31% of the designer population and 29% of the non-designer population.

Overall, there were more women (63%) who participated in the survey than men (37%). As Keusch (2012) noted in his research studying response rates for online surveys, the higher response of women than men is typical of surveys. The designer group had a more even distribution of men (43%) and women (57%), while the non-designer group had a much larger majority women (68%) than men (32%).

The educational attainment of the respondent population was fairly high, where the overall majority of participants held a master's degree (42%) and all participants had at least some college experience. 29% of both the designer and non-designer groups obtained a bachelor's degree. The designer group did have a slightly higher educational attainment, with a larger percentage of participants holding a master's degree (45%) and PhD (20%).

Table 3. Participant Socio-Demographic Characteristics

Socio-Demographic Characteristics			
Characteristic		Designers Frequency (%)	Non-Designers Frequency (%)
Study Group (n=196)	Designer	84 (42.86)	0 (0.00)
	Non-Designer	0 (0.00)	112 (54.11)
Age (n=128)	18-29	12 (22.22)	12 (16.22)
	30-39	12 (22.22)	18 (24.32)
	40-49	7 (12.96)	10 (13.51)
	50-59	13 (24.07)	22 (29.73)
	60-69	10 (18.52)	9 (12.16)
	70+	0 (0.00)	3 (4.05)
	Total	54 (100.00)	74 (100.00)
Gender (n=128)	Male	23 (42.59)	24 (32.43)
	Female	31 (57.41)	50 (67.57)

Table 3. Participant Socio-Demographic Characteristics (cont'd)

	Total	54 (100.00)	74 (100.00)
Education (n=128)	Some College	2 (3.64)	9 (12.33)
	Associate's Degree	1 (1.82)	1 (1.37)
	Bachelor's Degree	16 (29.09)	21 (28.77)
	Master's Degree	25 (45.45)	30 (41.10)
	PhD	11 (20.00)	12 (16.44)
	Total	55 (100.00)	73 (100.00)

Research Question Testing

As stated in the Literature Review chapter, the central research question has been defined as: **Are there differences in perception of on-premise commercial sign regulations between designers and non-designers?** To answer this central question, and the associated sub-questions, One-Way Analysis of Variance (ANOVA) tests have been used to analyze the data. The One-Way ANOVA tests determine if there are significant differences between designers and non-designers for each sign code type and the indicators beauty, interest and order.

Differences in Code Applications

To equate the perceptions of designers and non-designers, a one-way ANOVA test was used to compare the combined mean scores of the indicators beauty, interest, and order for the no code (*Table 4*), zoning code (*Table 6*), and form-based (*Table 8*) sign code models. The results showed statistically significant differences between designers and non-designers for the no code application ($F(1, 164) = 6.211, p = 0.014$) and for the form-based code application ($F(1, 147) = 4.614, p = 0.033$). The zoning code application was not found to be statistically significantly different ($F(1, 161) = 2.057, p = 0.153$). The mean scores displayed in *Table's 5, 7, and 9* are on a

standard scale, where higher scores indicate more beautiful, more interesting, and more ordered ratings, and lower scores indicate less beautiful, less interesting and less ordered ratings. Although the mean scores of the designer and non-designer groups were not identical, they were both consistent in their rating of each code type. For both groups, the form-based code application had the highest aesthetic ranking (Designers M=3.35, Non-Designers M=3.49), with the zoning code application as the middle ranking (Designers M=3.21, Non-Designers M=3.32), and no code applications with the bottom ranking (Designers M=2.60, Non-Designers M=2.82). The mean scores displayed in *Table's 5, 7, and 9* show that non-designers consistently rated all of the sign code applications with better aesthetic scores than the designer group.

Table 4. No-Code Application - One-Way ANOVA

No Code Application - One-Way ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.969	1	1.969	6.211	.014
Within Groups	51.984	164	.317		
Total	53.953	165			
	Indicates Significant Difference				

Table 5. No Code Application Descriptive Statistics - One-Way ANOVA

No Code Application - Descriptive Statistics				
	N	Mean	Std. Deviation	Std. Error
Designers	71	2.6009	.47432	.05629
Non-Designers	95	2.8211	.62088	.06370
Total	166	2.7269	.57183	.04438

Table 6. Zoning Code Application - One-Way ANOVA

Zoning Code Application - One-Way ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.484	1	.484	2.057	.153
Within Groups	37.861	161	.235		
Total	38.345	162			
	Indicates Significant Difference				

Table 7. Zoning Code Application Descriptive Statistics - One-Way ANOVA

Zoning Code Application - Descriptive Statistics				
	N	Mean	Std. Deviation	Std. Error
Designers	70	3.2071	.50476	.06033
Non-Designers	93	3.3172	.46952	.04869
Total	163	3.2699	.48652	.03811

Table 8. Form-Based Code Application - One-Way ANOVA

Form-Based Code Application - One-Way ANOVA					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	.769	1	.769	4.614	.033
Within Groups	24.509	147	.167		
Total	25.279	148			
	Indicates Significant Difference				

Table 9. Form-Based Code Application Descriptive Statistics - One-Way ANOVA

Form-Based Code Application - Descriptive Statistics				
	N	Mean	Std. Deviation	Std. Error
Designers	64	3.3490	.41010	.05126
Non-Designers	85	3.4941	.40699	.04414
Total	149	3.4318	.41328	.03386

Code Applications by Indicator

Using a one-way ANOVA test, each of the sign code applications were analyzed by the indicators beauty, interest, and order to identify any significant differences between the designer and non-designer populations.

No Code Sign Models

The associated sub-question Q1 tested if there is a significant difference in perception of beauty, interest, and order in the **no code** sign models between designers and non-designers.

There are statistically significant differences in the perception of beauty ($F(1, 164) = 9.395$, $p =$

0.003) and order ($F(1, 164) = 4.302, p = 0.040$) for the no code applications between the designer and non-designer groups. There are no statistically significant differences between designers and non-designers for the perception of interest ($F(1, 164) = 0.679, p = 0.411$) for the no code sign models.

Table 10. No Code Application and Indicator - One-Way ANOVA

No Code Application and Indicator - One-Way ANOVA						
Code and Indicator		Sum of Squares	df	Mean Square	F	Sig.
No Code Beauty	Between Groups	3.711	1	3.711	9.395	.003
	Within Groups	64.784	164	.395		
	Total	68.495	165			
No Code Interest	Between Groups	.371	1	.371	.679	.411
	Within Groups	89.637	164	.547		
	Total	90.008	165			
No Code Order	Between Groups	2.801	1	2.801	4.302	.040
	Within Groups	106.777	164	.651		
	Total	109.578	165			
	Indicates Significant Difference					

Zoning Code Sign Models

The associated sub-question Q2 tested if there is a significant difference in perception of beauty, interest, and order in the **zoning code** sign models between designers and non-designers. There are statistically significant differences in the perception of beauty ($F(1, 161) = 3.336, p = 0.070$) for the zoning code applications between the designer and non-designer groups. There are no statistically significant differences between designers and non-designers for the perception of interest ($F(1, 161) = 0.612, p = 0.435$) and order ($F(1, 160) = 0.372, p = 0.543$) for the zoning code sign models.

Table 11. Zoning Code Application and Indicator - One-Way ANOVA

Zoning Code Application and Indicator - One-Way ANOVA						
Code and Indicator		Sum of Squares	df	Mean Square	F	Sig.
Zoning Code Beauty	Between Groups	1.087	1	1.087	3.336	.070
	Within Groups	52.459	161	.326		
	Total	53.546	162			
Zoning Code Interest	Between Groups	.311	1	.311	.612	.435
	Within Groups	81.879	161	.509		
	Total	82.190	162			
Zoning Code Order	Between Groups	.123	1	.123	.372	.543
	Within Groups	52.779	160	.330		
	Total	52.901	161			
	Indicates Significant Difference					

Form-Based Code Sign Models

The associated sub-question Q3 tested if there is a significant difference in perception of beauty, interest, and order in the **form-based code** sign models between designers and non-designers. There are statistically significant differences in the perception of beauty ($F(1, 147) = 6.209, p=.014$) and interest ($F(1, 146) = 4.728, p=.031$) for the no code applications between the designer and non-designer groups. There are no statistically significant differences between designers and non-designers for the perception of order ($F(1, 147) = 0.109, p = 0.742$) for the no code sign models.

Table 12. Form-Based Code Application and Indicator - One-Way ANOVA

Form-Based Code Application and Indicator - One-Way ANOVA						
Code and Indicator		Sum of Squares	df	Mean Square	F	Sig.
Form-Based Code Beauty	Between Groups	1.805	1	1.805	6.209	.014
	Within Groups	42.732	147	.291		
	Total	44.537	148			
Form-Based Code Interest	Between Groups	1.945	1	1.945	4.728	.031
	Within Groups	60.062	146	.411		
	Total	62.007	147			
Form-Based Code Order	Between Groups	.025	1	.025	.109	.742
	Within Groups	34.277	147	.233		
	Total	34.302	148			
	Indicates Significant Difference					

Mean Comparisons

The mean scores displayed in *Table's 13, 14, and 15* are on a standard scale, where higher scores indicate more beautiful, more interesting, and more ordered ratings, and lower scores indicate less beautiful, less interesting and less ordered ratings. Designers rated the form-based code application as the most beautiful (M=3.20) and the most ordered (M=3.77), and the zoning code application as the most interesting (M=3.12). The non-designers rated the form-based code application as the most beautiful (M=3.42), interesting (M=3.31), and ordered (M=3.75). Both the designer and non-designer groups rated the form-based code application as the most beautiful and the most ordered, and the no code application as the least beautiful (Designers M=2.37, Non-Designers M=2.67), least interesting (Designers M=2.77, Non-Designers M=2.86), and least ordered (Designers M=2.67, Non-Designers M=2.93).

Table 13. No Code Application & Indicator - Descriptive Statistics for One-Way ANOVA

No Code Application and Indicator - Descriptive Statistics					
Indicator		N	Mean	Std. Deviation	Std. Error
Beauty	Designer	71	2.3662	.58528	.06946
	Non-Designer	95	2.6684	.65886	.06760
	Total	166	2.5392	.64430	.05001
Interest	Designer	71	2.7676	.69092	.08200
	Non-Designer	95	2.8632	.77337	.07935
	Total	166	2.8223	.73858	.05732
Order	Designer	71	2.6690	.77434	.09190
	Non-Designer	95	2.9316	.83031	.08519
	Total	166	2.8193	.81493	.06325

Table 14. Zoning Code Application & Indicator - Descriptive Statistics for One-Way ANOVA

Zoning Code Application and Indicator - Descriptive Statistics					
Indicator		N	Mean	Std. Deviation	Std. Error
Beauty	Designer	70	3.0286	.60724	.07258
	Non-Designer	93	3.1935	.54190	.05619
	Total	163	3.1227	.57492	.04503
Interest	Designer	70	3.1214	.70421	.08417
	Non-Designer	93	3.2097	.71976	.07464
	Total	163	3.1718	.71228	.05579
Order	Designer	69	3.4928	.62716	.07550
	Non-Designer	93	3.5484	.53194	.05516
	Total	162	3.5247	.57322	.04504

Table 15. Form-Based Code Application & Indicator - Descriptive Statistics for One-Way ANOVA

Form-Based Code Application and Indicator - Descriptive Statistics					
Indicator		N	Mean	Std. Deviation	Std. Error
Beauty	Designer	64	3.1953	.56073	.07009
	Non-Designer	85	3.4176	.52240	.05666
	Total	149	3.3221	.54857	.04494
Interest	Designer	64	3.0781	.63132	.07891
	Non-Designer	84	3.3095	.64893	.07080
	Total	148	3.2095	.64947	.05339
Order	Designer	64	3.7734	.50340	.06292
	Non-Designer	85	3.7471	.46690	.05064
	Total	149	3.7584	.48143	.03944

Chapter 5: Discussion

The aim of the discussion is to interpret the results presented in the previous chapter and draw rational conclusions that would further develop the understanding of the central research question. This chapter discusses the perceptions of the code applications, the assessment of the three indicators beauty, interest and order, and the similarities and differences in communication and expression of these perceptions between the designer and non-designer groups.

On-Premise Commercial Sign Codes

Post analysis results show that there are in fact differences in perception of on-premise commercial sign regulations between designers and non-designers, but there are also many similarities between these groups as well. Significant differences were found in both the no code application ($F(1, 164) = 6.211, p = 0.014$) and the form-based code application ($F(1, 147) = 4.614, p = 0.033$) between the designer and non-designer groups. The three code types used in this study structurally vary the organization of signage, which may explain why only two of the three code types had statistically significant differences. The zoning code application ($F(1, 161) = 2.057, p = 0.153$), which was not found to be perceived differently between the study groups, is the median in structural signage organization. The no code and form-based code applications are on two separate ends of the spectrum, suggesting that the chaos of the no code application and rigid design of the form-based code show greater differences in perception between designers and non-designers. In addition to the structural signage organization of the code types, zoning codes have historically been the most prevalent types of sign regulations in the United States

(Liebermann, 2002). The familiarity of a zoning code could also be a contributing factor to the common perception between designers and non-designers on this signage code application.

Similarities between these two groups become more apparent when analyzing the mean scores of the no code, zoning code and form-based code applications. As noted in the previous chapter, the mean scores for the code applications are on a standard scale, where higher scores indicate more beautiful, more interesting, and more ordered ratings, and lower scores indicate less beautiful, less interesting and less ordered ratings. Even though there are statistically significant differences between the study groups, the mean scores of the code applications show that the no code, zoning code, and form-based code applications were consistently ranked in the same order between designer and non-designer groups. The no code application for designers (Designers $M=2.60$, Non-Designers $M=2.82$) had the lowest mean score, meaning that it was perceived as the least beautiful, interesting and ordered. The zoning code application (Designers $M=3.21$, Non-Designers $M=3.32$) had the median score, followed by the form-based code application (Designers $M=3.35$, Non-Designers $M=3.49$) which had the highest mean score, implying that it was perceived as the most beautiful, interesting and ordered. This indicates that designers and non-designers both perceive similar aesthetics in the sign code models, but participants with design background consistently rated each indicator more harshly than their non-designer counterparts. This concept is explored in greater detail in the sub-section, Perception & Communication, of this chapter.

Beauty, Interest & Order

The familiar proverb, beauty is in the eye of the beholder, expresses the diverse nature of the perception of beauty, a conclusion derived from the analysis of the indicators beauty, interest and order. For all of the code applications, beauty was the only variable to have a statistically significant difference between designers and non-designers. Order and interest were only perceived as significantly different between study groups for a single code application, indicating that these characteristics are more universally understood than beauty. These findings relate to previous research, where Gjerde (2011) specifically identifies order and interest as the primary factors that influence environmental aesthetic perception. Beauty may be the variable in which professional training in planning and design influences perception. Historically, beauty changes based on society, time and culture (Hunt, Fate & Dodds, 2011). Perception of beauty is greatly affected by outside influences (Hunt et al., 2011), and when comparing designers and non-designers, education may be that outside influence defining differences in perception.

Unlike beauty, interest and order were more commonly perceived across the three different code types, each only showing significance in one code type. In several of the previous studies (Crawford et al., 2015; Portella, 2014; Gjerde, 2011; Nasar & Hong, 1999), aesthetic perception was measured using these two variables. It is valuable to note that synonyms for aesthetic include visual, appealing, and beautiful, and that beauty may be a more complex variable than interest and order, comprised of these factors instead of completely separate of them. That being said, this study validates that when rating signsapes, measures of interest and order can be useful tools in developing new sign controls. Because of their more common perception, interest and order are factors that can be assumed to more accurately represented

by designers in their codes. Because of the significant differences between the designer and non-designer groups, beauty becomes a variable that must be given greater attention in early stages of public planning and participation in order to accurately represent the needs and desires of the people.

Perception & Communication

As touched upon earlier in this chapter, the designer and non-designer groups evaluated the model sign codes in a consistent order, but the significant differences in the form-based and no code sign applications could be described by the dissimilarity in strength of rating that was given to the indicators by the study groups. Those with a design background consistently rated each indicator more harshly than their non-designer counterparts. This result correlates with work by Gjerde (2011), who studied perceptions of urban streetscapes by designers and non-designers. Gjerde found both similarities and differences between the study groups, and that designers expressed stronger opinions with overall harsher evaluation of the streetscapes than the non-designer group. In this study, the designer group was more critical than the non-designer group when evaluating the sign code models. This suggests that designer's professional and educational background may provide them with the confidence to make stronger convictions about the sign code models.

Because of the range between the mean scores of the designers and non-designers, it is conceivable that the difference in evaluation could affect communication between these two groups. To study this in greater detail, word clouds have been generated using the open ended positive and negative responses for each code application using the applet Wordle. Wordle uses

an algorithm that takes the frequency of verbs, adjectives, and nouns and reflects them at different scales within a word cloud image (Feinberg, 2014). The more times a word is used, the larger the font used to display that word becomes. The words, sign, signs and signage, have been removed to provide a more accurate image of the language used to describe the model signscapes.

Overall observations from studying the word clouds note the simplicity of the descriptions by the non-designers, who used words like nice and boring, was a contrast to the designers who began to identify principals of design to describe why that sign code had a certain appearance. The non-designer group also used more nouns in their descriptions while the designers tended to evaluate the sign codes with more descriptive words and adjectives. Both groups regularly identified other vertical aspects of the streetscape in relation to the signage, like trees, buildings, the sidewalk, street and lamps. In these instances, the study groups both took the time to more clearly articulate their thoughts through the identification of objects instead of simply stating if the signscape was good or bad.

No Code Sign Models

The no code application word clouds with participant positive and negative responses are displayed below in *Figure 10*. Listed in approximate order from most frequently to least frequently used, the words read, scale, visible, Potbelly (name of a business), and building were the most prevalent in the designer group's positive responses. The positive text most frequently used by the non-designer group includes good, read, sidewalk, easy, looks, and interesting. Designers used the words street, many, sidewalk, pole, awning, and much in their negative responses, while non-designers concentrated on the words street, look, pedestrians, and like.

Visibility and readability were key positive characteristics identified to describe the no code application, and the word “read” was specifically used by both study groups. Other language supporting this includes visible, looks, and easy. The most frequent word used in the negative response was street, relating the negative relationship between the signage and the street. Next to the word “street,” there was little overlap in major words between the designer and non-designer groups. The designers used language like many, and much to refer to the quantity of signs within the signscape, where the non-designers focused the word pedestrians negatively describing the lack of pedestrian orientation of the signage.

Figure 10. No Code Sign Models Positive & Negative Responses

Presented in *Figure 11* are the negative and positive responses for the zoning code sign model. Positive responses for the zoning sign code model from the designer group are trees, street, drivers, better, and visible. The non-designers most frequently used positive words include building, look, window, street, trees, and clean/cleaner. Negative language from the designer group includes street, Green Door (name of a business), less, boring and awning. Non-designers negatively responded more frequently with the words building, mulch, green, see, road, and like.

Regarding the overall positive responses for the zoning code sign models, the words street and trees were frequently mentioned by both groups. Designers again identified visibility, particularly to drivers, as a positive feature, while the non-designers specified the window sign as a point of focus and the street as clean. The Green Door, one of the establishments modeled in one of the zoning sign code models, was a negative focus for both groups. The word “awning” was also found in the negative responses, which correlates with this business which has a large, decorated awning sign spanning across the entire building. The designer group used the word boring to describe the signscape, and non-designers mentioned the words “see” and “read” negatively, referring to the visibility of the signage.



Figure 11. Zoning Code Sign Models Positive & Negative Responses

Form-Based Code Sign Models

Figure 12 displays the positive and negative word clouds for the form-based code sign models. In approximate order from most frequently to least frequently used, scale, pedestrian, trees, nice, ordered, building, sidewalk, and good were the most frequently mentioned words when describing the positive by the designer group. The non-designers used the language nice, looks, like, clean, street, green awnings, lamp, good, and trees to describe their positive

Chapter 6: Conclusion

The purpose of this chapter is to summarize the results of this research into final conclusions. In addition to supporting answers to the central and associated sub-questions, this chapter also explores the implications of the findings, relating them to public participation in planning and the development of more universal sign regulations. Limitations and potential future research related to perception of designers and non-designers of on-premise commercial sign regulations are also discussed in greater detail.

Principal Conclusions

Like much of the previous literature, there are both differences and similarities between the designer and non-designer groups. By studying the survey results from a broad to detailed scale, six principal conclusions were ascertained from this research.

(1) There are significant differences in the perception of on-premise commercial sign regulations between designers and non-designers on signscales represented by the no sign code ($F(1, 164) = 6.211, p = 0.014$) and form-based sign code ($F(1, 147) = 4.614, p = 0.033$) applications, the most and least structurally organized regulations. There was no statistically significant ($F(1, 161) = 2.057, p = 0.153$) difference between the zoning code application, which is likely because of its median structural organization of signage and prevalence of use in current American signscales.

(2) There similarities in perception of the on-premise commercial sign regulations between designers and non-designers of which sign code applications produced the most beautiful, interesting, and ordered streetscape. The form-based code had the best aesthetic score

(Designers M=3.35, Non-Designers M=3.49), the zoning code had the median aesthetic score (Designers M=3.21, Non-Designers M=3.32), and the no code had the least favored aesthetic score (Designers M=2.60, Non-Designers M=2.82). This was consistent between both designer and non-designer groups, regardless of statistically significant differences found in the no code and form-based code applications.

(3) Significant differences between the streetscape models were produced from the degree to which the designers and non-designers ranked the indicators beauty, interest, and order, where designers tended to give lower scores than non-designers, but the order in which the study groups ranked the model streetscapes was consistent for each code.

(4) Beauty was the only indicator to have a statistically significant differences between the designer and non-designer groups for all of the streetscape models. The indicators order and interest were much more commonly rated across the sign models, suggesting that beauty is perceived differently than these two indicators between designers and non-designers.

(5) The mean scores for what signs were ranked as the least beautiful, interesting and ordered were much more harshly rated by the designers than the non-designers, thus producing significant differences in the indicator beauty for all sign code applications, and for the no code and form-based code sign models.

(6) The harshness in evaluation by the designers in comparison to the non-designer group is the difference in perception, and likely occurs due to the designer group looking through the lenses of an expert critical eye, where training allows them to justify their convictions more strongly than the non-designers. Because of the consistency of mean scores, the results suggest that it is not that designers perceive the model sign codes much differently than the non-

designers, but that they are simply much more critical with their evaluations, leading to statistically significant differences in the no-code and form-based model streetscapes.

Implications

Cities today are striving to create an attractive, thriving public realm to further their economic, cultural and social development, where creating quality environments is essential for urban growth and competition (Witter & Crawford, 2013; Pugalish, 2009). Developing sign regulations conducive to creating these high quality urban environments plays an important role in making these cities a reality. This research begins to uncover some of the perceptions that make it possible to develop more universal and justifiable sign codes.

By understanding differences in communication and evaluation of on-premise commercial sign regulations, designers can more effectively coordinate with the public to create well received sign codes. This research shows that there are commonalities and differences in the perceptions of commercial signscapes between designers and non-designers, therefore, suggesting that professionals within the planning and design realm cannot assume they entirely understand the wants and needs of the community for whom they are designing. The perception of beauty, in particular, is an area where these differences in perception are apparent. Because this characteristic is not mutually understood, professionals designing sign regulations should pay closer attention to the input of the public in regards to their perception of beauty.

Because public participation in planning is designed to be a cooperative evolution of ideas between designers and the community (Creighton, 2005), clear communication between designers and laypeople is an important facet of guiding public participation that yields constructive results. This study shows that designers tend to be more critical in their judgements of

commercial sign regulation than non-designers, a weakness that could potentially hinder collaboration between designers and the community who they are designing for. In order to develop better communication, designers should consider listening to the public to build off of their initial ideas prior to presenting too much of their own. In this way, designers will not impose their negative tendencies, allowing the public to first elaborate on their thoughts and present their desires prior to taking in a professional critique.

Commercial sign codes influence the physical characteristics and placement of commercial signs, giving them the ability to impact the visual quality and perception of a streetscape. There was a similarity between groups that showed a distinct pattern of preference for the sign code models, where the form-based code had the highest aesthetic score, followed by the zoning code models, with the no code application having the lowest overall score. One important finding of this research confirms that people like the structure of having a sign code regardless of professional planning or design training, where the level of structural organization was associated with more positive perception of signscape models. Implications of these findings show that regulation for signage is justified by contributing to more positively streetscapes, which aids in the development of an attractive, thriving public realm.

Limitations and Future Research

Little previous research has been conducted on the perception of commercial sign regulation, and existing literature suggests change in perception of signage over time. Because this research is of the first of its kind, it is important to recognize that studies like this are merely a starting point for the study of designers and non-designers on perceptions of sign regulation. This, coupled with the time dimensional quality of this study, suggests that to accurately

represent perceptions of signage over time, this type of research will need to be repeated in the future. Like Berger (2014) notes, in his study *Signs and The Downtown Experience*, perceptions of signage has changed dramatically within the last ten years, so it is uncertain for how long this research will accurately represent perceptions of on-premise commercial sign regulations. To accurately represent perceptions of on-premise commercial sign regulations in the future, this study will need to be repeated to keep up with changing perceptions of signage.

Every attempt was made to create accurate and justifiable signscape models representing the no code, zoning code, and form-based code applications. Based on individual interpretation of the sign codes, there is potential for inaccuracy when creating the sign code models. By using existing streetscapes with a zoning code application, this was circumvented for two of the six streetscape models, but the validity of the no code and form-based code models could fall victim to an unintentional bias. To most accurately represent the considerations when creating the sign code models, the development of the models is very clearly stated in the methods chapter of this text.

A convenience snowball sampling strategy was used in this study to reach a greater number of potential participants and specific sample populations, like planning/design professionals, necessary for this research (Lee, 2014b). It is valuable to note that the use of a convenience sampling strategy may affect the generalizability of findings. For more generalizable results, it would be useful to use a random sampling strategy in potential future research.

Beauty was the only indicator found to be statistically significant between designers and non-designers across the three sign code types. Because of the irregularity demonstrated by beauty in contrast to the other indicators, interest and order, this characteristic could be studied

in greater detail to aid in the understanding of why there are differences in perception of this indicator and if there are other variables that may contribute to the perception of beauty.

APPENDICES

APPENDIX A: Permission of Copyright from the Journal of Current Urban Studies



Figure 13. Permission of Copyright from the Journal of Current Urban Studies

APPENDIX B: Web Survey Pages Used For This Study

* 2. What is your stakeholder affiliation? Please Choose one option that best defines you as a participant.

- ☐ Homeowner
- ☐ Business Owner
- ☐ Rental Property Owner
- ☐ Student
- ☐ Developer
- ☐ Government Affiliation
- ☐ Institution Affiliation
- ☐ Planning/Design Professional
- ☐ Sign Manufacturer

Other (please specify)

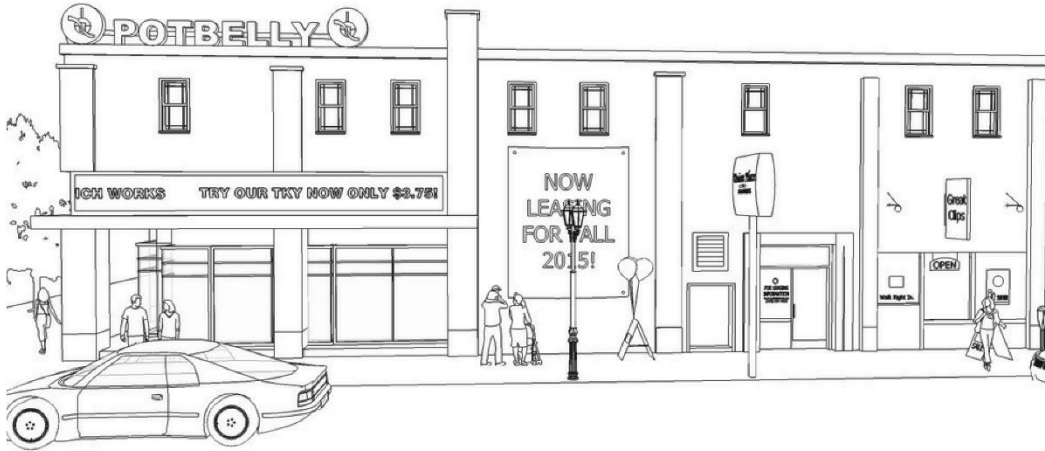
* 3. Please select the statement that most accurately describes your familiarity with the Grand River / Michigan Ave corridor in the Greater Lansing Area. (Downtown East Lansing to Downtown Lansing)

- ☐ I have been to and am familiar with the Grand River / Michigan Ave corridor in the Greater Lansing Area
- ☐ I have never been to and/or I am not familiar with this area

Figure 14. Web Survey Page – Demographics 1

Comparison Location 1

East Lansing- 1



20. Rate the streetscape along each of the following scales

Very Beautiful	Beautiful	Neutral	Ugly	Very Ugly
☐	☐	☐	☐	☐

21. Rate the streetscape along each of the following scales

Very Boring	Boring	Neutral	Interesting	Very Interesting
☐	☐	☐	☐	☐

22. Rate the streetscape along each of the following scales

Very Ordered	Ordered	Neutral	Chaotic	Very Chaotic
☐	☐	☐	☐	☐

23. Please indicate the main positive and negative characteristics of the commercial signs in the East Lansing- 1 image.

Positive	
Negative	

Figure 15. Web Survey Page – East Lansing 1

East Lansing- 2



24. Rate the streetscape along each of the following scales

Very Beautiful	Beautiful	Neutral	Ugly	Very Ugly
☐	☐	☐	☐	☐

25. Rate the streetscape along each of the following scales

Very Boring	Boring	Neutral	Interesting	Very Interesting
☐	☐	☐	☐	☐

26. Rate the streetscape along each of the following scales

Very Ordered	Ordered	Neutral	Chaotic	Very Chaotic
☐	☐	☐	☐	☐

27. Please indicate the main positive and negative characteristics of the commercial signs in the East Lansing- 2 image.

Positive	
Negative	

Figure 16. Web Survey Page – East Lansing 2

Comparison Location 2

East Michigan Ave Downtown- 1



28. Rate the streetscape along each of the following scales

Very Beautiful	Beautiful	Neutral	Ugly	Very Ugly
☐	☐	☐	☐	☐

29. Rate the streetscape along each of the following scales

Very Boring	Boring	Neutral	Interesting	Very Interesting
☐	☐	☐	☐	☐

30. Rate the streetscape along each of the following scales

Very Ordered	Ordered	Neutral	Chaotic	Very Chaotic
☐	☐	☐	☐	☐

31. Please indicate the main positive and negative characteristics of the commercial signs in the East Michigan Ave Downtown- 1 image.

Positive	
Negative	

Figure 17. Web Survey Page – East Michigan Ave Downtown 1

East Michigan Ave Downtown- 2



32. Rate the streetscape along each of the following scales

Very Beautiful	Beautiful	Neutral	Ugly	Very Ugly
☐	☐	☐	☐	☐

33. Rate the streetscape along each of the following scales

Very Boring	Boring	Neutral	Interesting	Very Interesting
☐	☐	☐	☐	☐

34. Rate the streetscape along each of the following scales

Very Ordered	Ordered	Neutral	Chaotic	Very Chaotic
☐	☐	☐	☐	☐

35. Please indicate the main positive and negative characteristics of the commercial signs in the East Michigan Ave Downtown- 2 image.

Positive	
Negative	

Figure 18. Web Survey Page – East Michigan Ave Downtown 2

Comparison Location 4

Downtown Lansing- 1



44. Rate the streetscape along each of the following scales

Very Beautiful	Beautiful	Neutral	Ugly	Very Ugly
☐	☐	☐	☐	☐

45. Rate the streetscape along each of the following scales

Very Boring	Boring	Neutral	Interesting	Very Interesting
☐	☐	☐	☐	☐

46. Rate the streetscape along each of the following scales

Very Ordered	Ordered	Neutral	Chaotic	Very Chaotic
☐	☐	☐	☐	☐

47. Please indicate the main positive and negative characteristics of the commercial signs in the Downtown Lansing-1 image.

Positive	
Negative	

Figure 19. Web Survey Page – Downtown Lansing 1

Downtown Lansing- 2



48. Rate the streetscape along each of the following scales

Very Beautiful	Beautiful	Neutral	Ugly	Very Ugly
☐	☐	☐	☐	☐

49. Rate the streetscape along each of the following scales

Very Boring	Boring	Neutral	Interesting	Very Interesting
☐	☐	☐	☐	☐

50. Rate the streetscape along each of the following scales

Very Ordered	Ordered	Neutral	Chaotic	Very Chaotic
☐	☐	☐	☐	☐

51. Please indicate the main positive and negative characteristics of the commercial signs in the Downtown Lansing- 2 image.

Positive	
Negative	

Figure 20. Web Survey Page – Downtown Lansing 2

Participant Background

In the last section, please provide a little bit of information about yourself.

78. What is your age?

- ☐ 18-29
- ☐ 30-39
- ☐ 40-49
- ☐ 50-59
- ☐ 60-69
- ☐ 70+

79. What is your gender identity?

- ☐ Male
- ☐ Female

80. What is your highest level of education?

- ☐ High school
- ☐ Some College
- ☐ Associate's Degree
- ☐ Bachelor's Degree
- ☐ Master's Degree
- ☐ PhD

Figure 21. Figure 14. Web Survey Page – Demographics 2

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