

INFLUENCE OF NEW URBANIST DESIGN FEATURES ON SENSE OF COMMUNITY:
THE CASE OF CHERRY HILL VILLAGE IN CANTON, MICHIGAN

By

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ABSTRACT

INFLUENCE OF NEW URBANIST DESIGN FEATURES ON SENSE OF COMMUNITY: THE CASE OF CHERRY HILL VILLAGE IN CANTON, MICHIGAN

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This study explored the influence of New Urbanist design features on sense of community in the State of Michigan by employing Cherry Hill Village, a major New Urbanist development in Canton, Michigan, as its case study. Using a quantitative survey method, online surveys were utilized to procure data. A total of 136 surveys were collected for data analysis and analyzed using multiple regression, one-way ANOVA and t-test analyses.

The variables investigated within this study, derived from the theoretical foundations and previous empirical studies of New Urbanism and sense of community, include New Urbanist architectural design features, New Urbanist community design features, walkability, and socio-demographic variables. Utilizing Skjaeveland, Garling, and Maeland's (1996) 14-item Multidimensional Measure of Neighboring to conceptualize sense of community, the findings indicate that specific design features, as well as walkability and some socio-demographic characteristics, have a significant effect on sense of community.

In light of the increasing popularity of New Urbanist developments in the State of Michigan, this study suggests the importance of physical design features in promoting sense of community and gives guidelines for future design.

This thesis is dedicated to my
parents for their unconditional love
and endless support.

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CHAPTER 1

INTRODUCTION

Located primarily outside of main civic areas on large single lots, subsidized housing became increasingly popular post-World War II in the form of government issued loans to returning veterans (Hashas, 2004). These subsidized housing types were developed with a low-density spatial relationship, lacking common shared facilities. As a result of this altered spatial relationship, dependency on the vehicle escalated (Lee & Ahn, 2003). The suburban development has since developed to become an integral part of the American physical and social environment.

The physical traits of the suburban development and resulting social implications have gained increased criticism over the years. Consequently, a new planning design movement labeled New Urbanism emerged in the early 1990s as a counterpoint to these housing developments, aiming to provide a better quality of life through the encouragement of sense of community and neighborly social life (Bookout, 1992; Langdon, 1997). The New Urbanist movement claims that suburban developments promote harmful trends, including but not limited to an increased dependency on the vehicle, resulting naturally in less walkability, as well as insufficient housing variety. Isolation of residents from social interactions and lack of distinct architectural physical relationships among structures are further negative traits typical of suburban developments (Duany & Plater-Zyberk, 1992; Calthorpe, 1993; Katz, 1994; Langdon, 1994). Moreover, residents of suburban developments tend to fall into the same socio-economic statuses, a trait considered by some to have a damaging effect on rich social relations derived from social diversity (Kelbaugh, 1989; Duany & Plater-Zyberk, 1992; Anderson, 2000).

Several social theorists have criticized the weakening of sense of community in the United States, (Keyes, 1973; Sarason, 1974; Yankelovich, 1981; Olson, 1982; Dunham, 1986; Lyon, 1987). Yankelovich (1981) found in national surveys distributed to the American public that almost half of Americans claimed that they are deeply involved in the search for community. One of the main reasons cited for this search was a need to compensate for the negative implications of mass urban society (Wilson & Baldassare, 1996). Suburban developments have been suggested to have major negative consequences on their residents, resulting in a diminishing overall sense of community (McKenzie, 1967; Milgram, 1970; Wirth, 1938). For example, social isolation is suggested to be an effect of too much privacy due to the design of suburban residential environments (Alexander, 1966). On the other hand, sense of community is often referenced as a major asset of the New Urbanist design model (Audirac, 1999; Adler, 1995; Kelbaugh, 1997; Kim & Kaplan, 2004). Sense of community has been related to several positive social effects, including but not limited to increased neighboring and community participation (Chavis & Wandersman, 1990; Unger & Wandersman, 1982). The emphasis of sense of community as a social goal in New Urbanism coupled with the positive social effects related to it make this social goal in particular worth researching.

The physical New Urbanist design model derives inspiration from the American small town, characterized by distinct architectural features, including a mix of residential and commercial properties, a well-defined center and edge, dedicated public and open spaces, and pedestrian-friendly design (Duany & Plater-Zyberk, 1991; Calthorpe, 1993). The claims of New Urbanist developments assert that community interaction can be encouraged through the selection of an appropriate physical design (Duany & Plater-Zyberk, 1992). Walkability, created by physical features such as sidewalks and proper street lighting, will support people in

satisfying their needs without resorting to vehicle dependence, thus increasing their social interactions with other residents. This interaction with neighbors on a consistent basis, aiding in the satisfaction of the individuals' daily needs, is thought to increase sense of community (Kelbaugh, 1989; Duany & Plater-Zyberk, 1992; Lee & Ahn, 2003). So on this basis, the inclusion of workspaces, commercial properties, and retail developments within the residential area becomes an essential part of the New Urbanist development design (Calthorpe, 2001).

The concept of New Urbanism has presently gained an increasing level of research interest (Hashas, 2004; Voisin, 2005; Sukolratanamettee, 2006; Beidler, 2007; Erkul, 2009; Arciniega, 2009). While there have been some studies conducted on sense of community in New Urbanism (Litman, 2004; Song & Knaap, 2003), few studies explored sense of community in New Urbanism in the State of Michigan (Kim, Lee, & Bell, 2008). Furthermore, while the exterior physical design elements of New Urbanism have been studied, there are few current studies that have explored interior design elements and their significance within these developments. This study aims to fill that gap by exploring both interior and exterior physical design elements of a New Urbanist community in the State of Michigan.

The rising of New Urbanism in the State of Michigan is apparent by its increasing use of its principles in several different planning and community development strategies. The economic recession has hit the State of Michigan particularly hard, with an increasing number of deserted residential neighborhoods, foreclosures, vacant business buildings and decaying civic centers. To counteract these negative effects, the state has implemented numerous planning policies including but not limited to Master Plan Projects in several Michigan cities as well as Brownfield Redevelopments (Kim, Lee, & Bell, 2008). Another indication of the emergence of New Urbanism in this state is illustrated through an initiative started by Michigan State University- a

New Urbanism Bus Tour program was created to facilitate the understanding of the main design and planning principles of this movement by faculty and students of the university (Land Policy Institute, 2007 in Kim, Lee, & Bell, 2008). In addition, several communities have been developed under the principles of New Urbanism, including Cherry Hill Village in Canton and Celadon New Town in Grand Rapids. The combination of these efforts indicates a growing interest and implementation of the principles of New Urbanism, making further studies in the actuality of its results compared to its planning goals a significant area of research. Despite some studies being conducted in Michigan (Kim, Lee, & Bell, 2008; Erkul, 2009), little have explored the relationship of the physical exterior as well as the interior design elements of New Urbanism on sense of community.

The social agenda of New Urbanism in particular is a significant area of study as the social claims of this movement are substantial (Talen, 1999). Generally speaking, New Urbanism aims to foster a sense of community through the integration of private residential space with its surrounding public space and through the particular design and placement of public space. However, Krier (1991) asserts that implementing the New Urbanist philosophy is not merely an architectural model, but rather a manufacture of a new social system. Thus, it is theorized within the New Urbanism model that the local environment has a tremendous effect on human behavior; in other words, improved design leads to improved human behavior (Talen, 1999). Various studies have pointed to the positive connection of having a high level of sense of community on various facets of life. Child health, economic growth, and job attainment are just some of the multiple positive connections found to be attributed to healthy levels of sense of community (Harphan, De Siva, & Tuan, 2006; Chou 2006; Rupasingha, Goetz, & Freshwater, 2006; Granovetter, 1973; McDonald & Elder, 2006; Nguyen, Allen, & Godkin, 2006).

Furthermore, Talen (1999) emphasizes further research into the social goals of New Urbanism because despite its innate appeal, the concept of a traditional American neighborhood as a community design model is not a universally held ideal. Past attempts at creating a sense of community through the physical environment, as in the examples of the highly admired designs of Pullman, Illinois or James Rouse's new town of Columbia, Maryland, have not succeeded due to expecting too much from the physical environment on their social goals (Brooks, 1974; Tennenbaum, 1990). Additionally, the trend of gated communities and further social disintegration may indicate a natural preference for "non-territorial forms of association" (Talen, 1999, pg. 1362). This predisposition or natural inclination of the American social life contradicts the holistic community social agenda of New Urbanism. Therefore, further empirical evidence promoting the social agenda of New Urbanism is required to overcome this obstacle (Audirac et al., 1992; Berry, 1976).

The movement of New Urbanism continues to gain increasing support despite various criticisms. Over the last ten years, the Congress of New Urbanism has grown to over 3,100 members in 20 countries and 49 states (CNU, 2010). This increasing popularity, particularly with the rise of New Urbanist developments in the State of Michigan, coupled with the controversial criticism and lack of empirical evidence of the movement presents a case for conducting further research in this area.

The Purpose of the Study

The study's purpose is to empirically investigate whether physical New Urbanist design elements and guidelines have an effect on promoting sense of community in residents of a New Urbanist neighborhood. By employing a case study analysis of a New Urbanist development in

Canton, Michigan and addressing the multi-dimensional sense of community in the neighborhood context according to Skjaeveland, Garling, and Maeland's (1996) definition of neighboring, the study's specific research objectives are:

1. To identify how New Urbanist architectural design features influence sense of community in residents of a New Urbanist neighborhood.
2. To explore how New Urbanist community design features influence sense of community in residents of a New Urbanist neighborhood.
3. To explore how walkability influences sense of community in residents of a New Urbanist neighborhood.
4. To explore how socio-demographic features influence sense of community in residents of a New Urbanist neighborhood.

Significance of the Study

Despite the various criticisms the New Urbanist design movement has faced, its increasing popularity and potential to become an alternative way of living and enhancing quality of life is apparent. Although New Urbanism claims to promote sense of community through its physical features, there is little solid empirical evidence to back up this claim. Therefore, this study can contribute to the empirical body of knowledge on whether New Urbanism promotes a sense of community as it declares by providing evidence on the relationship between physical design features and sense of community. Theoretically, the study is able to contribute to the body of knowledge of sense of community studies by utilizing and testing a specific instrument of measuring sense of community developed based on previous studies.

Practically, the economic decline in the State of Michigan has led several of its cities to implement great efforts in rehabilitating the resulting negative planning issues including but not limited to distressed downtowns, obsolete residential neighborhoods, and abandoned streets (Kim, Lee, & Bell, 2008). These efforts incorporate new community design, as in the case of the New Urbanist community of Cherry Hill Village, illustrating the growing prevalence of New Urbanism as a concept in Michigan (Kim, Lee, & Bell, 2008). Despite the rising of New Urbanism in the State of Michigan, few studies have been conducted in this region. Thus, the findings of this study are expected to reveal valuable information on the actuality of the New Urbanist physical design intentions in this state to improve future developments.

For designers, the results of this research can be utilized to develop design guidelines, which enhance the quality of life in residents of New Urbanist neighborhoods. Designers may also be able to utilize findings in creating better environments that are more equipped to foster sense of community. Furthermore, previous studies have mostly focused on the exterior design elements of New Urbanism. This study incorporated interior design elements and their effect on sense of community as well. By combining both interior and exterior physical design elements, the potential of creating a new physical design model in the future which enhances sense of community appears. The study findings are also anticipated to produce significant contributions to the development of specific housing policy.

Overview of the Following Chapters

From this point, this thesis is organized in the following manner:

Chapter 2, the literature review, consists of three main parts examining the theoretical background and previous empirical studies conducted on New Urbanism and its related social

goals, most specifically the social goal of sense of community. The first section provides an overview of the theories, practice, and principles of New Urbanism. The second section will discuss sense of community and its relevant influential design features. Third, the conceptual model of the study is presented along with the study's research questions.

Chapter 3 presents the research methods of the study. A description of the research design and rationale for utilizing it is given, followed by the criteria used for case selection. Next, the case study is reviewed and analyzed against New Urbanist principles. Finally, additional information including population and sample, instrument, measurement and analysis are presented.

Chapter 4 reports the findings on the influence of New Urbanist design features on sense of community. First, preliminary descriptive analyses including frequencies and percentage distributions are given. Next, the factor analysis and reliability test of the dependent variable (sense of community) is presented. Then, findings from the regression analyses, ANOVA, and t-tests conducted to explore influential features on sense of community are reported.

Chapter 5 offers a discussion of the study's results based on the study's research questions and its theoretical and practical implications. Lastly, the study's limitations and suggestions for future studies are provided.

CHAPTER 2

LITERATURE REVIEW

The following chapter consists of three main sections examining the theoretical background and previous empirical studies conducted on New Urbanism and its related social goals, with an emphasis on the goal of sense of community. The theories, practice, and principles of New Urbanism are reviewed, including an overview of the pertinent design principles and goals of the movement in the first section. Sense of community and its conceptualization will be further elaborated on in the following section, examining its relevant influential architectural design features, community design features, and socio-demographic features. The conceptual framework of the study, based on the theoretical basis of New Urbanism and the phenomenon of sense of community, will be reviewed in the final section.

New Urbanism

Aiming to be a positive design model for community planning, the philosophy of New Urbanism became popularized in the early 1990s as a result of the escalating criticism surrounding conventional suburban developments. Planning with the New Urbanist philosophy in mind entails the development of compact, mixed-use, pedestrian-friendly, and relatively self-contained communities (Arciniega, 2009). To better understand the philosophy of New Urbanism, a review of its theoretical basis, practice and principles is necessary

Theoretical Background of New Urbanism

The New Urbanist philosophy is founded on several related social and urban theories. New Urbanism theory began with the teachings of Leon Krier, an Urbanist who was inspired by

the City Beautiful movement. Krier highly praised historic urban types and favored what he refers to as an authentic urbanism, gaining its principles from the traditional European city. Forms such as squares and streets were considered to be the timeless elements of civic architecture in Krier's mind (Krier, 1979). Streets are not merely an afterthought, but rather an essential element of the public space, functioning on both the public and private levels; an urban form accented with small blocks, well-defined streets, and attractive public squares is preferential in his philosophy (Grant, 2006).

Additionally, the theory of New Urbanism is built upon the work of Kevin Lynch, who identified the traits of good city form as legibility, identity, and sense of place (Lynch, 1981). Lynch describes five target physical elements of the good city form. These elements include paths, landmarks, nodes (intersections), edges (boundaries), and districts or zones. Paths include any channels that a traveler moves through while landmarks indicate major points of reference. Physical objects in a prime location and ease of remembrance are requisites of a landmark. Nodes, simply put, are circulation intersections. Walls, especially exterior, and walkway edges enclosed by guardrails with drop-off points to one or both sides are examples of edges. Distinct areas within the physical environment are referred to as districts or zones. Examples can include a food court at a shopping mall, public areas, and office or work areas (Lynch, 1960). These elements combined create the good city form according to Lynch's theory.

Jane Jacobs is debatably another major contributor to the New Urbanist theory. Although some argument exists on whether Jacobs did directly provide to the theory of New Urbanism, several recent studies have cited her as being a contributing theorist (Cabrera, 2010; Erkul, 2009; Sukolratanamettee, 2006). In Jacobs's (1961) *Death and Life of Great American Cities*, her basic model of what makes a city livable is conceptualized; since several of her model components

coincide with the elements of New Urbanism, she is included as a contributing theorist in this study. According to Jacobs, the urban traits that should be advocated include a dynamic street life, creating an opportunity for people to have increased social interactions, as well as a sense of safety. Sense of safety is created through involved neighborhood surveillance of public space, an occurrence she refers to as “eyes upon the street” (Jacobs, 1961, p. 45). Jacobs asserts that a higher level of personal belonging, attachment, and social cohesiveness is derived from well defined, mixed use, and diverse neighborhoods, elements that cohesively lead to a sense of urban vitality.

New Urbanism is further based on the work of Christopher Alexander, who conceptualized a “pattern language” investigating universal principles of good form and urban development (Alexander, Ishikawa, & Silverstein, 1977). Sociologist William Whyte (1988) is additionally credited with adding to the theoretical foundation of New Urbanism, as his work linked the comprehension of human behavior to improving urban designs. As a whole, these combined theoretical foundations paved the way for future architects to put in place the conceptual theory of New Urbanism into reality. In practice, New Urbanism is often used as an umbrella term for several approaches, including Smart Growth, Traditional Neighborhood Development (TND), and Transit Oriented Design (TOD). Swift (2007) generally defines New Urbanism as “a set of development practices to create more attractive, efficient and livable communities” (p. 1). Despite this definition of New Urbanism, in order to fully understand what the movement promotes based on its theoretical background, each individual approach is reviewed.

Smart Growth. Along with the U.S. Environmental Protection Agency (EPA), a number of non-profit and government organizations came together in 1996 to form the Smart Growth

Network, or SGN (Smart Growth Online, 2011). Unlike the term New Urbanism, the concept of Smart Growth lacks a distinct definition (Arciniega, 2009). The principles of the Smart Growth movement as outlined on the organization’s website (www.smartgrowth.org, maintained by the National Center for Appropriate Technology) are presented in Table 1 on the following page.

Table 1. *Smart Growth Principles**

Principle	Description
Compact Building Design	Design communities in a way which allows more open space to be preserved, making more efficient use of land and resources through building construction. Grow buildings vertically rather than horizontally.
Create Range of Housing Opportunities and Choices	Provide quality housing for people of all income levels and a wider range of housing choices.
Create Walkable Neighborhoods	Build places with multiple destinations within close proximity, where the streets and sidewalks balance all forms of transportation.
Encourage Community and Stakeholder Collaboration	Involve the community early and often in the planning process to vastly improve public support for smart growth and often lead to innovative strategies that fit the unique needs of each community.
Foster Distinctive, Attractive Communities with a Strong Sense of Place	Encourage communities to craft a vision and set standards for development and construction which respond to community values of architectural beauty and distinctiveness, as well as expanded choices in housing and transportation.
Make Development Decisions Predictable, Fair and Cost Effective	State and local governments must make an effort to make development decisions about smart growth more timely, cost-effective, and predictable for developers.
Mix Land Uses	The integration of mixed land uses into communities is a critical component of achieving better places to live.
Preserve Open Space, Farmland, Natural Beauty and Critical Environmental Areas	Term “open space” broadly means natural areas both in and surrounding localities that provide important community space, habitat for plants and animals, recreational opportunities, farm and ranch land (working lands), places of natural beauty and critical environmental areas (e.g. wetlands).
Provide a Variety of Transportation Choices	Implement new approaches to transportation planning, such as better coordinating land use and transportation; increasing the availability of high quality transit service; creating redundancy, resiliency and connectivity within their road networks; and ensuring connectivity between pedestrian, bike, transit, and road facilities.
Strengthen and Direct Development Towards Existing Communities	Direct development towards existing communities already served by infrastructure

* Information Source: www.smartgrowth.org

A review of these principles clearly shows the similarities between them and the concept of New Urbanism. There is some debate as to whether the Smart Growth movement trumps the New Urbanist movement. The main difference between Smart Growth and New Urbanism is that while New Urbanism presents its own set of design principles, Smart Growth is actual legislation initiatives (Arciniega, 2009). While New Urbanism is viewed as an urban design movement, Smart Growth initiatives are presently used to control sprawl in the United States on the legislative level (Arciniega, 2009). Thus, despite the possibility of Smart Growth being stronger in practical implementation due to the strength of the SGN, which is presently comprised of over 40 different organizations, the similarity in its design ideals to those of New Urbanist design elements allow it to be considered as an approach of New Urbanist theory.

Traditional neighborhood development (TND). Florida based architects Andres Duany and Elizabeth Plater-Zyberk were predominantly influenced by Krier's aforementioned theories. Inspired by his American adaptation of the traditional European city, Duany and Plater-Zyberk began creating a model of traditional urban development after hearing Krier speak at a lecture in 1980. Eventually, the pair founded their own architecture and planning firm (DPZ), aspiring to engage in a new approach to housing development. In 1982, DPZ, alongside developer Robert Davis, turned their new philosophy to reality in their first major development, a resort named Seaside located in Florida (Krieger, 1998). Seaside is the first community planned and developed with TND principles and stands as the most iconic to this day.

The TND principles are inspired as the name suggests by traditional neighborhoods, characterized by their compact streets allowing for bicycling and feasible walking distances between commercial and residential properties. Walkability in TND neighborhoods is reinforced through the use of well-landscaped sidewalks and walkways. A distinct characteristic of TND

involves the inclusion of a town center for commercial, civic, and residential uses (Arciniega, 2009). The architectural design of buildings in a TND is inspired from historical or classical architecture; in addition, a variety of mixed-used and several housing types are usually evident in these types of neighborhoods. For example, single-family homes are typically interspersed with condominiums and apartments. Another significant distinct design element of TND is the use of a street facing front porch. The front porch in TND is utilized as a method of transition between public and private spaces, aiming to enhance the social interactions of neighbors within the community. Placing the garage at the rear of the house as opposed to the front is another distinct design element that is revived through the use of TND; this leads to the inclusion of street and lane parking. Streets tend to be narrower, with particular attention being paid to elements that reduce vehicular speed to promote safety. The case study neighborhood for the purposes of this research was designed under TND principles.

Transit oriented design (TOD). While Duany and Plater-Zyberk were developing their TND approach, California based architect Peter Calthorpe was focusing on another aspect of urban planning- the implications of sustainable development on urban form (Calthorpe, 1993). Calthorpe's urban design techniques remained similar to those of Duany and Plater-Zyberk in several ways. However, his focus on the creation of walkable neighborhoods led to the development of the "pedestrian pocket", a concept that has become integral to the New Urbanist theory. Calthorpe recognized the significance of transportation patterns in regional development; thus, he emphasized pedestrian friendly designs as well as viable public transportation (Calthorpe, 1993). The concept of the pedestrian pocket promotes the development of well-organized towns linked together by a regional rapid transit system (Girling & Helphand, 1994). While DPZ's Seaside highlighted architectural features inspired from the Traditional

Neighborhood, the pedestrian pocket focuses more on transportation and access, hence pioneering the approach of Calthorpe's Transit Oriented Design (TOD), a framework which places public transportation or the transit system as the basis of a regional settlement system (Calthorpe, 1993). The concept of the pedestrian pocket aspires to manage regional growth through several design strategies including the creation of a commercial centre providing local employment for residents, and well-designed streets and public spaces to promote walkability (Girling & Helphand, 1994). These design elements of the pedestrian pocket and TOD were combined with the TND principles used in the development of Seaside and eventually formalized into a written document entitled the Ahwahnee Principles.

Formalization of New Urbanism

In 1991, Peter Katz, author of "The new urbanism: toward an architecture of community", urged the Local Government Commission (LGC) of which he was a staff-member, to group key individuals who have been leaders in innovating fresh ideas in urban planning (Corbett & Velasquez, 1994). Thus, the LGC brought Duany and Plater-Zyberk, Calthorpe, Michael Corbett, Stefanos Polyzoides and Elizabeth Moule together. The group was then assigned the task of finding common elements in the new planning approaches- ranging from Neo-traditional planning to sustainable design- and developing an inspired set of new community principles. In addition, they were required to compose a set of regional principles based on how each community should relate to the region. Last but not least, the group was asked to define the implementation of the aforementioned principles in cities and counties as an alternative to suburban sprawl. The culmination of these ideas was gathered and formally documented by attorney Steve Weissman (Corbett & Velasquez, 1994). In the fall of 1991, this draft was presented to approximately 100 local elected officials during a conference held at the Ahwahnee

Hotel in Yosemite National Park; gaining outstanding support, the official manuscript was then accepted and aptly titled the Ahwahnee Principles, becoming the first documented articulation of New Urbanism (Corbett & Velasquez, 1994). This same year, the term Neo-traditional Planning was replaced by the universal term New Urbanism.

Two years after the creation of the Ahwahnee Principles, that same group of innovators gathered to found the Congress for the New Urbanism (CNU), presently the leading organization to promote and support New Urbanist designed communities (Fulton, 1996). Based in Chicago, the CNU's first congress attracted 100 people to the event, showing the growing yet still under-discussed interest of the concept at the time. As previously mentioned, the CNU today is comprised of over 3,100 members in 20 countries and 49 states, demonstrating the continuously growing movement of New Urbanism (CNU, 2010). At the fourth annual Congress in 1996, the CNU established the Charter of New Urbanism, an official publication building upon the principles outlined in the Ahwahnee Principles. In addition to containing an explanatory preface of the CNU's mission and perspective on the modern city, The Charter outlines the principles utilized in building better communities. Presenting them from the interconnected and interdependent scales of the region, the neighborhood, and the block, the Charter acts as a guide for public policy, development practice, urban planning, and design (Calthorpe & Fulton, 2001; CNU, 2010)

Previous Empirical Studies

The increasing interest in New Urbanism as a planning policy has led to a growing body of research. This research can be generally categorized into two groups. The first group deals with the complex issue of walkability and its related subcategories (i.e. travel patterns,

pedestrianism). The second group focuses on the social and psychological doctrines of New Urbanism, including phenomena such as social capital and sense of community.

There are several studies in the first group that test the claim of New Urbanism which states that its distinct physical features can affect travel behavior and lessen vehicle dependence in residents of New Urbanist neighborhoods (Joh et al., 2008; Khattak & Evenson, 2005; Khattak et al., 2005; Krizek, 2003; Nasar, 2003). These studies employed a comparative methodology to analyze differences in New Urbanist neighborhoods and conventional suburban developments in various states, including Ohio, North Carolina, California and Washington. These studies supported the New Urbanist claim, as residents of New Urbanist neighborhoods were found to make significantly less automobile trips, fewer external trips and travel fewer miles compared to their suburban counterparts.

Other researchers also tested new Urbanism's claim that walkability is enhanced in its neighborhoods when compared to suburban developments by analyzing residents' walking patterns (Evenson et al., 2006; Joh et al., 2008; Lund, 2003). The findings of these studies indicate that while there is no statistically significant difference between residents' physical activity in either type of neighborhood, residents of New Urbanist neighborhoods exhibited higher levels of pedestrian activity, walking more for practical purposes. Thus, New Urbanist physical features affecting the streetscape may foster a higher level of pedestrian activity. Additionally, a study conducted by Kim, Lee, and Bell (2008) surveying Michigan residents' opinion on several New Urbanist design principles found that 78.0% Michigan residents rated the importance level of a walkable community higher than the point 5 (neutral point), with an average score of 7.55 out of 10.

In the second group, there are various studies that have produced findings supporting the idea that different physical features of the built environment have a positive effect on social

connections. Levine (1986) found that more use of public space has a positive effect on social interactions. Other physical features that have been found to produce the same effect include use of shopping facilities (Riger, LeBailly, & Gordan, 1981), libraries (Varheim, 2009) and neighborhood facilities such as retail, entertainment, and religious institutions (Ahlbrandt, 1984). Although these studies report findings supporting the claim that physical design features have a positive effect on social capital, none were specifically studies of New Urbanist design principles, setting the present study apart from this previous work. Additionally, there is a lack of studies researching the effect of New Urbanist design principles on sense of community that specifically include interior design elements.

Critiques of New Urbanism

Despite its increasing popularity, New Urbanism as a design model has garnered much critique from several researchers, thus indicating a need for further empirical evidence. One major critique of the New Urbanist ideal is the “communitarian trap” intrinsic to New Urbanist developments (Harvey, 1997). According to Harvey, the ideal New Urbanist development aims to revive a community which has inherent traits of social control and surveillance, asserting that communities that are well founded tend to exclude others (Harvey, 1997). Thus, although New Urbanism preaches diversity alongside sense of community, it may be difficult to achieve them both, as sense of community may very well be a result of homogeneity (Talen, 1999). A study conducted by Burkhardt (1981) concluded that residents tend to avoid heterogeneous social interactions, preferring to socialize in homogenous social groups instead. According to Klein (1978), social comfort is improved through similar demographic characteristics including but not limited to race, age, religion and occupation. Income diversity and stimulated commerce fail to be supported by New Urbanist projects according to Marshall (2004), while Lehrer and Milgrom

(1996) argue that the physical model of New Urbanism has a bias towards a specific consumer market.

In addition, the design focus of New Urbanism is viewed as a negative aspect since the leaders in the field are mostly comprised of architects unfamiliar with planning and social theory, and are thus not as interested in policy development (Brain, 2005; Grant, 2006). New Urbanism is also criticized of being nostalgic purely in form by placing traditional architectural features and urban forms without regard to the connections between spatial forms and socio-economic processes that create these traits (Grant, 2006; Harvey, 1997). Thus, the model of New Urbanism has been criticized of being “artificial” by creating a superficial sense of community and culture through an imitation of traditional architectural styles (Landecker, 1996; Southworth, 1997).

Furthermore, some of the developments created in the name of New Urbanism consume the same amount of land as conventional sprawl does, and would therefore be more accurately be labeled as “New Suburbanist” communities, neighborhoods which are little more than “sprawl with porches” (Pollard, 2001). This critique of the movement is mostly aimed at those developments that merely claim to be New Urbanist in nature, when in reality are comprised of subdivisions with typical oversized “McMansions”, with the addition of porches and white picket fences. Krieger (1998) argues that New Urbanist developments generate homogenous subdivisions that are still largely dependent on the vehicle rather than public transportation.

New Urbanist developments are also criticized with ignoring the realities of suburban life, including but not limited to traffic congestion, urban crime, and environmental pollution (McGrath, 2008). McGrath (2008) utilizes the town of Kentlands in Maryland, a "well-promoted New Urbanism imitator", as an example of this neglect (p.1). In this neighborhood, the narrow streets are not capable of providing adequate parking or easy access for emergency vehicles. In

addition, the location of Kentlands in Maryland farmland means that residents are still heavily dependent on their vehicles for work, shopping, and other activities. Not being flexible enough to changes and suggestions from its residents because of rigid control on its physical features is another criticism (Durack, 2001; Southworth, 1997).

Last but not least, a major critique of New Urbanism is that it is a reincarnation of Modernist environmental determinism, stemming from a belief that a specific type of physical design can cure societal issues (Grant, 2006; Talen, 2003; Talen, 2008). However, despite this New Urbanist assumption, previous research is conflicted, therefore resulting in an inconclusive decision on the relationship between physical neighborhood design and sense of community (Fleming et al., 1985; Gans, 1962; Michelson, 1970; Talen, 2003; Webber, 1963; Wellman & Leighton, 1979). While New Urbanism claims that the physical features of its developments are to be credited for residents' unity, Grant (2006) concluded that is rather more based on homogeneity and self-selection. Brindly (2003) also asserts that sense of community is a result of larger social networks which take time to develop, rather than just physical design features. New Urbanism claims that when its principles are employed, the built environment as a result will create a sense of community; critics point out that this social claim is based heavily on urban planning theory rather than solid empirical support (Plas & Lewis, 1996; Talen, 1999). This concept, which is the focus of the present study, is plagued by lack of solid evidence. Thus, Talen (1999) urges further research into this topic since the social doctrine of New Urbanism is a major component of its theory, but there is no concrete evidence of support on the relationship of physical New Urbanist design features and sense of community. Therefore, the following section will begin to examine the complex phenomenon of "sense of community", exploring its conceptualization and theoretical background. In addition, previous empirical studies conducted

on the influential New Urbanist architectural design features, New Urbanist community design features, and socio-demographic features on sense of community will be reviewed.

Sense of Community

This study focused on exploring sense of community as a result of the physical design of a specific neighborhood in the State of Michigan developed under New Urbanist principles. The following will review the definition of sense of community in this study, as well as previous empirical studies conducted on the relationship between New Urbanism and sense of community and its related influential factors.

Theoretical Background of Sense of Community

Sense of community is an important area of study, as previous research has indicated that healthy levels of social capital (defined in the sense of social interaction and social connections) have a positive connection with various facets of life, including but not limited to child health (Harphan, De Siva, & Tuan, 2006), dental health (Pattussi, Hardy, & Sheiham, 2006), economic growth (Chou, 2006; Rupasingha, Goetz, & Freshwater, 2006), job attainment (Granovetter, 1973; McDonald & Elder, 2006; Nguyen, Allen, & Godkin, 2006) and business success (Stobart, 2005). It is important to note that “sense of community” is a wide term consisting of various definitions and measurements. For example, sense of community can be defined in terms of social interaction and psychological aspects (Talen, 2002). The social interaction aspect of sense of community encompasses social networks and neighborly emotional support. Emotional support can be further categorized into two distinct types: sociability, or casual neighborly interaction, and socio-emotional, closer relationships between neighbors comparable to those relationships between family and friends (Unger & Wandersman, 1985). However, sense of

community can also be defined in other terms. For this reason, it is imperative to review previous studies which have conceptualized sense of community, as well as to define the term and its measurement in relation to this study.

Seymour Sarason initially advocated for the need to create a discipline that has the concept of the psychological sense of community as its center in his 1974 book *The psychological sense of community: Prospects for a community psychology*. Sarason theorized that the key to understanding one of the major pitfalls of society, the negative side of individualism, was grounded in sense of community. Alienation, selfishness, and despair were the negative outcomes of individualism according to Sarason, and developing a sense of community would provide the remedy to that problem (Dalton, Elias, & Wandersman, 2001; Fisher, Sonn, & Bishop, 2002). Therefore, one of the main objectives of his book was to communicate three interrelated conclusions that he derived as a result of his involvement in community mental health. The first states that a lack of sense of community was extremely frequent. Second, that it was a destructive force in living. Last but not least, dealing with its results as well as working on its prevention should be the main focus and concern of community psychology (Fisher et. al, 2002; Sarason, 1974). By 1986, the *Journal of Community Psychology* released two special editions focused on sense of community research, answering Sarason's advocacy. The special editions featured different research teams who have established scales measuring sense of community (Davidson & Cotter, 1986; Doolittle & Macdonald, 1978; Fisher et. al 2002; Glynn, 1981; Riger & Lavrakos, 1981).

McMillan and Chavis (1986) further pushed the establishment of the theoretical conceptualization of sense of community by presenting a model of the psychological sense of community (PSC). In this model (see Figure 1 on the following page), four facets construct the

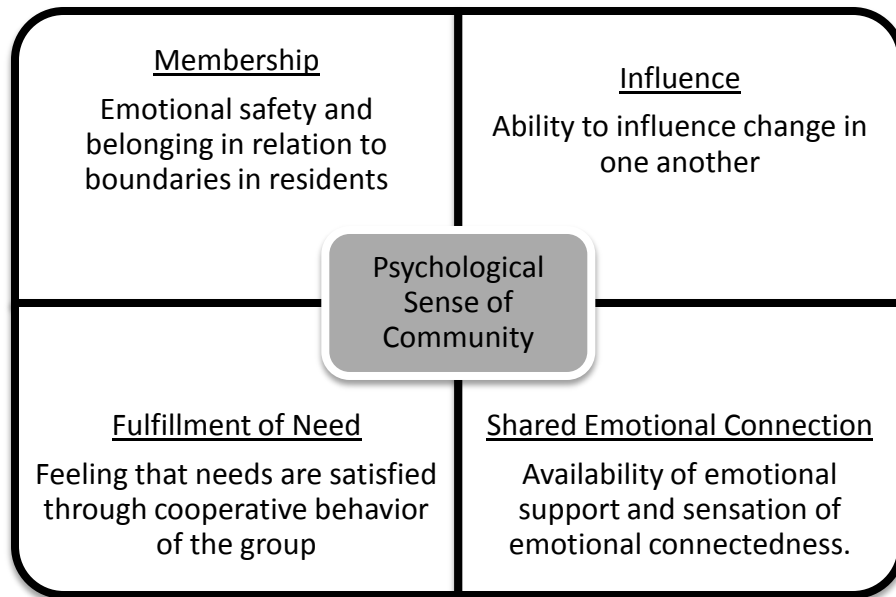


Figure 1. *Psychological Sense of Community*
 Created by author based off of McMillan and Chavis's (1986) PSC

psychological sense of community. The first facet is membership, offering a sense of emotional safety and belonging in relation to boundaries in residents. The second aspect is influence, defined as an ability to influence change in one another. Third is the fulfillment of need, or the emotion of feeling that needs are satisfied through cooperative behavior of the group. Last but not least is shared emotional connection, achieved by the availability of emotional support and sensation of emotional connectedness.

Definition and Measurements

As previously indicated, the sense of community in an individual has been the research interest of several community psychologists and urban researchers (Buckner, 1988; Chavis et al., 1986; Davidson & Cotter, 1986; Glynn, 1981; Nasar & Julian, 1995; Skjaeveland, Garling, & Maeland, 1996). As a result, there are several similar measures of sense of community, each possessing a slight difference mainly due to the varying psychological dimensions of sense of community, as well as its relevant context. The Sense of Community Index (SCI) developed by

Chavis et al. (1986), serves as the basis for several of these instruments, and is thus combined with other items or instruments to develop new measurements (Chavis & Pretty, 1999).

One of the most popular measurements of sense of community is derived from the aforementioned PSC model presented by McMillan and Chavis (1986). Chavis et al. (1986) created this shorter form of the SCI, an instrument consisting of 12 True or False items representing the four facets of the PSC. On the positive side, this instrument has a strong theoretical basis (Chipuer & Pretty, 1999) and has been tested in various studies (Plas & Lewis, 1996; Sonn & Fisher, 1996). That being said, this instrument has been deemed to possess a relatively low level of internal reliability among four subscales, and is thus recommended to be utilized as a one dimensional measure only (Chipuer & Pretty, 1999).

Buckner (1988) is credited with the creation of another instrument measuring neighborhood cohesion. Neighborhood cohesion in this sense is a variable that represents the PSC as well as attraction to neighborhood and social interaction. Buckner (1988) asserts that sense of community is a collective quality among community residents. Therefore, his instrument consists of 18-items measuring neighborhood cohesion (i.e. sense of community) at a collective level. This instrument provides a good level of internal consistency and test-retest stability at the individual-level of analysis, due to its utilization of three scales- attraction-to-neighborhood (3 items), neighboring (6 items), and psychological sense of community (9 items). Nonetheless, the construct validity of this instrument at the neighborhood-level of analysis still requires further testing. Although this instrument hypothetically represents a three-dimensional measurement, the results indicate a one-dimensional solution. In other words, the instrument is valid when analyzing the 18 items as a single dimension (Skjaeveland, Garling, & Maeland, 1996).

Based on Glynn's (1981) instrument, Nasar and Julian (1995) developed a shorter instrument comprised of an 11-item scale. Their instrument reiterates various dimensions of sense of community found by Glynn. These include supportive relationships in the community, similarity and relationship patterns of community residents, individual involvement in the community, and community security. The results of this instrument indicate reliable and valid measures of the PSC at the neighborhood scale. Even so, just as the aforementioned measurements, this instrument does not allow an analysis of a separate dimension of community (Sukolratanamettee, 2006).

Skjaeveland, Garling, and Maeland's 14-item Multidimensional Measure of Neighboring (1996)

Skjaeveland, Garling, and Maeland (1996) present a 14-item Multidimensional Measure of Neighboring (MMN). This instrument employs four-dimensions of sense of community which include Supportive Acts of Neighboring, Neighbor Annoyance, Neighborhood Attachment, and Weak Social Ties. The following is a brief explanation of these four dimensions:

Supportive acts of neighboring. This dimension includes the psychological aspect of community, social interactions that can be observed, and the exchange of help and goods.

Neighbor annoyance. This dimension involves the negative evaluation of neighbors, as well as a sense of safety in the home.

Neighborhood attachment. This dimension covers the concept of place attachment, defined as the establishment of emotional bonds with specific places. According to this definition, Bonaiuto et al. (1999) state that neighborhood attachment is created through both social and psychological processes that occur between the individual and the place, with a consequential outcome of thoughts and feelings about their environment.

Weak social ties. This dimension refers to casual social links among neighbors. Weak social ties are theoretically thought to occur between people with varying interests. In turn, these weak social ties tend to promote social integration in neighborhoods (Granovetter, 1973). Behaviors that constitute weak social ties include casual spontaneous conversations and neighbor greetings.

Tested in low-to-medium-income groups in urban residential areas in the city of Bergen, Norway, the four dimensions of the MMN are concluded to allow the analysis of each distinct dimension independently (Skjaeveland, Garling, & Maeland, 1996). Although further testing across different level incomes and regional cultures is necessary, the MMN is the only instrument from the aforementioned measures of sense of community which allows an analysis of the separate dimensions. Since community psychologists (Skjaeveland, Garling, & Maeland, 1996; Unger & Wandersman, 1985) generally agree that sense of community is a multi-dimensional phenomenon, this instrument is preferred in this study above the others. Since each dimension may be influenced by different factors of analysis, this multidimensional analysis has the ability to allow a separate evaluation of each dimension to determine their relevant influential factors as well as an analysis of the sense of community as a whole. Due to these reasons, this study will define and measure the phenomena of sense of community in terms of Skjaeveland, Garling, and Maeland's (1996) 14-item MMN.

Sense of Community and New Urbanism

Since this study focused on sense of community specifically in a New Urbanist development, in order to derive the relevant influential factors that were measured, a review of previous empirical studies as well as an analysis of the New Urbanist principles related to sense of community was necessary. The analysis of New Urbanism and its social goals is limited in the

literature, thus requiring further research. Nonetheless, Talen (2002) has provided an evaluation of the New Urbanist principles outlined in the Charter of New Urbanism based on three distinct types of social goals: community, social equity, and common good. In Talen's (2002) review of the 27 principles found in the Charter, eight were identified as being related to the social goal of social equity, while the remaining 19 relate to common good. Despite the fact that none of these principles are explicitly related to community, Sukolratanamettee (2006) has identified six principles from Talen's (2002) review that contain descriptive statements related to the perception of community (see Table 2).

Table 2. *New Urbanist Design Principles Related to Sense of Community**

Principle	Description
11	Neighborhood should be compact, pedestrian-friendly, and mixed- use. Districts generally emphasize a special single use, and should follow the principles of neighborhood design when possible. Corridors are regional connectors of neighborhoods and districts; they range from boulevards and rail lines to rivers and parkways.
13	Within neighborhoods, a broad range of housing types and price levels can bring people of diverse ages, races, and incomes into daily interaction, strengthening the personal and civic bonds essential to an authentic community.
16	Concentration of civic, institutional, and commercial activity should be embedded in neighborhoods and districts, not isolated in remote, single-use complexes. Schools should be sized and located to enable children to walk or bicycle to them.
18	A range of parks, from tot lots and village greens to ball fields and community gardens, should be distributed within neighborhoods. Conservation areas and open lands should be used to define and connect different neighborhoods and districts.
23	Street and squares should be safe, comfortable, and interesting to the pedestrian. Properly configured, they encourage walking and enable neighbors to know each other and protect their communities.
25	Civic buildings and public gathering places require important site to reinforce community identity and the culture of democracy. They deserve distinctive form, because their role is different from that of other buildings and places that constitute the fabric of the city.

* Information Source:

<http://ezproxy.msu.edu/login?url=http://search.proquest.com/docview/304931950?accountid=12598>

Each of the above principles is related to the sense of community in a distinct way. Principles 11 and 23 encourage social interactions among neighbors, which also results in the establishment of community bonds. Furthermore, community identity is reinforced through Principles 11 and 25. Principles 13, 16, and 18 provide a venue for sense of community. Intentional design decisions and placement of public spaces provide a setting for spontaneous encounters, establishing community bonds (Langdon, 1994). In addition, they promote a sense of place (Duany & Plater-Zyberk, 1992; Katz, 1994). The New Urbanist design elements derived from these principles are outlined Table 3.

Table 3. New Urbanist Design Elements Related to Sense of Community

New Urbanist Design Element	Traits
Architectural and Site Design	Traditional architectural design Spatial positioning of house (shallow setback) Utilization of porches and balconies Personalized house design Rear-facing garages
Mixed Land Use	Mixture of household types within neighborhood Mixture of residential and commercial land uses
Well-Defined	Identifiable center and edge
Public Space	Availability of parks and civic centers Integrated network of parks and open spaces
Walkability	Pedestrian oriented streets Presence of sidewalks Interconnected street systems
Density	Higher density Compact neighborhood Smaller lot sizes

As the focus of this study is to examine the relationship of not only New Urbanist architectural design features to sense of community, but New Urbanist community design features, walkability and socio-demographic features as well, the following section will explore each New Urbanist element summarized in the table above to identify the theoretical basis linking them to sense of community, subcategorizing them into New Urbanist architectural

design features, New Urbanist community design features, or walkability. In addition, by providing a further review of previous empirical studies, socio-demographic traits will be identified as relevant to this study.

Influential Factors of Sense of Community

The physical environment and its relevant features including architectural design features has been show to have an influence on sense of community along with community design features such as parks and public greens. Walkability is an integral component of New Urbanist design and has been studied as well. Additionally, individual or socio-demographic factors, including items such as length of residency and tenure type, have been identified in the literature to possibly have an effect on sense of community.

New Urbanist Architectural Design Features. New Urbanist neighborhoods aim to increase social interaction and sense of community through the use of architectural and site design that encourages the integration of private residential space with neighboring public space (Duany & Plater-Zyberk, 1992). Conversations between residents and pedestrians are encouraged through careful New Urbanist design elements such as street facing porches and shallow housing setback (Brown & Cropper, 2001). The use of porches in New Urbanist design is encouraged, as their presence theoretically generates pedestrian traffic by projecting the human presence within the house to street passers-by (Duany & Plater-Zyberk, 1992). Houses are typically set closer to the street on smaller lots with rear facing garages accessed through alleyways. Architecturally, custom design or personalization in houses is encouraged to create a sense of individuality, avoiding the look of a “cookie cutter” neighborhood (Talen, 1999).

The concept that physical architectural design features can promote social interactions among residents is supported by several studies. These physical factors can include structural

features of buildings (Gans, 1962), spatial arrangement of houses (Festinger, Schachter, & Back, 1950), and common civic areas (Fleming, Baum, & Singer, 1985). In Festinger et al.'s (1950) study of married student housing at MIT, the spatial arrangement of houses which required the use of common paths increased the level of neighboring among residents. Other studies support the idea that the use of front porches results in higher levels of social interactions and increased local surveillance in neighborhoods (Brown, Burton, & Sweaney, 1998). Personalization of the home has been shown to enhance place identity and neighborliness as well (Werner, Peterson-Lewis, & Brown, 1989).

Although there are no current studies that examine the role of interior design elements on the effect of sense of community in New Urbanist developments specifically, there are several studies which point to the effect of physical interior features on human psychology. In his study, Ziff (2004) explored the use of glass in interior architecture, concluding that the innate physical traits of glass, including but not limited to its transparency, allows a visual connection between two environments. In that sense, he asserts that transparent glass has an additional role in defining private and public boundaries, thus fostering a sense of community (Ziff, 2004). As previously mentioned in TND, this mimics the role of the front porch in transitioning between public and private spaces to increase social interactions between neighbors within a community. Thus, it is conceivable that the inclusion of more glass in an interior space, i.e. via the addition of larger windows, will enhance this relationship.

The floor plan layout of a residence and its effect on social interaction patterns within the home has been studied as well. Evans' (1996) study consisted of exploring the role of interior design elements, in this case the depth of the floor-plan layout, in diminishing the negative associations between residential crowding and psychological health. The results showed that

depth may be a significant architectural feature in regulating household reactions to crowding. The study confirmed previous research indicating that people living under crowded conditions tend to use social withdrawal as a means of coping (Baum & Valins, 1979; Baum et al., 1981; Evans et al., 1989; Evans & Lepore, 1993; Lepore et al, 1990, 1991; Evans 1996). Therefore, the study suggests that by incorporating a floor plan which maximizes spaces, such as an open floor plan concept, hereby reducing crowding, will help regulate social interactions and minimize if not completely reduce the necessity to socially withdraw as a means of coping with crowding living accommodations (Evans, 1996).

Another element that may affect the interior space planning of a residential floor plan involves the addition of outdoor living spaces within the architectural floor plan. In their study of middle-class American families and their patterns of leisure time and household consumption and clutter, Arnold and Lang (2007) reported a significant shift in the use of outdoor spaces, including but not limited to decks, backyards and front lawns. Whereas in the past these outdoor living spaces were purely functional, today they are essential in the satisfaction and sense of well being of families. For example, in the past back yards may have been used solely on a utilitarian basis, acting as a holding place for trash, coal ashes and outhouses, they are now instead seen as spaces for outdoor entertainment, with emphasis placed on their design and structure. Inserting these outdoor living spaces within the residential floor plan provides a center for entertaining, exercise, recreation and other activities (Arnold & Lang, 2007).

Figures 2 and 3 on the following page illustrate the difference in floor plan layout from a New Urbanist home and a typical suburban home created by the same developer for houses in Michigan. The first floor plan (Figure 2), presenting one of the many layouts available at the New Urbanist development Cherry Hill Village in Canton, MI, exhibits several of the unique

features associated with a New Urbanist home. Note that the garage is placed in the rear of the house, with a street facing porch located at the front. This results in a much narrower footprint than the typical suburban floor plan (Figure 3). Conversely, the suburban floor plan has the garage in the front, creating a wider foot print that results in lower density between homes. To further illustrate the interior space planning of a New Urbanist home design, Figure 4 on the following page presents a photograph of the interior of model home in Cherry Hill Village. The figure highlights an open floor plan concept with the kitchen open to the living room.

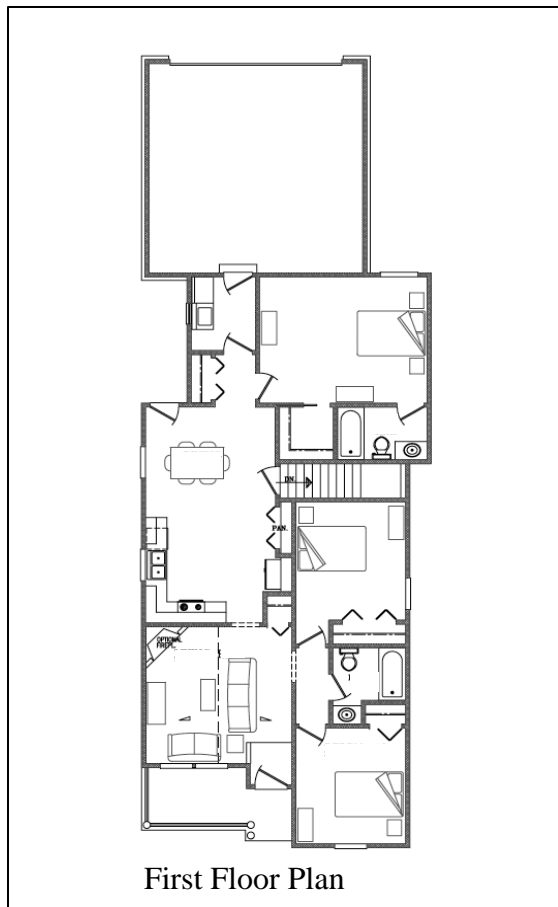


Figure 2. *Typical New Urbanist Floor Plan*
Courtesy of Livonia Builders, retrieved
from: <http://www.michbuilder.com/maple/>

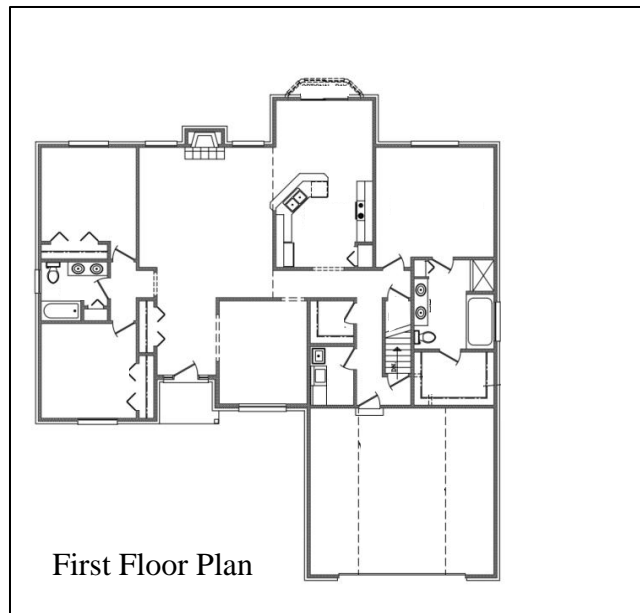


Figure 3. *Typical Suburban Floor Plan*
Courtesy of Livonia Builders, retrieved from:
<http://www.michbuilder.com/brookshire/>



Figure 4. *Interior of Model Home in CHV**

Courtesy of Carlson Productions LLC, retrieved from: <http://carlsonpro.com/>

*For interpretation of the references to color in this and all other figures, the reader is referred to the electronic version of this thesis.

New Urbanist Community Design Features. While the previously discussed architectural design features rely heavily on design elements of the home itself; the community level of the neighborhood also has relevant influential design features on sense of community. On the community level, town centers possess a high density to encourage commercial practicality and consequently an invigorated public “realm”; sense of community becomes an outcome of this new “realm” (Talen, 1999). Furthermore, in contrast to lower density suburban developments, New Urbanist theory asserts that compact, high-density design increases the potential of chance social encounter, producing an increased sense of community. Residentially, houses are placed on smaller lots to increase density.

The New Urbanist neighborhood also relies on having a clear center and defined edge. The center, typically a public space such as a park or square, is located near or in the middle of the neighborhood. The edge of the neighborhood is largely dependent on its context. Boulevards

or parkways usually define urban neighborhoods, while naturally reserved land or green belts define a village setting (Sukolratanametee, 2006). New Urbanist theory asserts that the combination of a clear and defined center and edge will enhance the community's social identity (CNU, 2010). Expert urban design combined with a well-defined center and edge results in a distinctive value of place. This in turn creates sense of community by increasing social identity and a sense of security (Brindley, 2003; Grant, 2006).

It is also important to note that the use of public spaces to promote sense of community is significant in New Urbanism as well. Public spaces may include parks, civic centers, and open spaces. These spaces can serve as symbols of public pride and sense of place, which promote the perception of community (Talen, 1999). Duany and Plater-Zyberk (1992) theorize that public spaces are key elements in promoting sense of place, simply through creating sense of space through proper design and placement. Furthermore, these spaces provide a venue for occasional encounters, strengthening community bonds and strengthening its spirit (Langdon, 1994). The availability of these spaces in a neighborhood thus may enhance social interactions within the community.

In addition, shared values and needs among residents to create social bonds have been shown to increase residents' sense of community (Hunter, 1975). Klein (1978) found that residents tend to have a higher level of social participation and obligation in smaller size groupings, as smaller settings lead to more opportunities for participation. Residents' degree of attraction to the neighborhood is related to high neighborhood cohesion in Buckner's (1988) study. Residential satisfaction toward the environment is found in another study to be correlated with a higher level of sense of community (Lund, 2002). Other influential factors that are not exclusively rooted in physical design i.e. also possessing an environmental basis but still are

relevant to social interactions have been identified by additional studies. These include feelings of safety (Newman, 1972), greater use of public space (Levine, 1986), and increased use of local facilities for shopping (Riger & Lavrakas, 1981).

Mixed land use is another New Urbanist design element that has been related to sense of community. Jacobs (1961) proposed the first theory relating mixed-land use with social interaction and sense of community. A New Urbanist neighborhood will supply a mixture of commercial and residential properties, including activities such as shopping and work as well as different housing types. This mixture provides an opportunity for pedestrians to linger, increasing the odds of “repetitive chance encounters” that are theorized to develop and strengthen community bonds (Achimore, 1993, p.34). Different housing types yield different demographic and income levels, thus promoting random personal contact of different people, theoretically resulting in a tighter sense of community (Talen, 1999).

Walkability. A significant component of New Urbanist neighborhood design is the creation of walkability through distinct physical features to lessen vehicle dependency. In addition to the previously discussed design features, walkability is promoted through the careful planning of streets, which possess an explicit social purpose in New Urbanism (Talen, 1999). Streets in New Urbanist theory are viewed as public spaces, providing a physical location for chance encounters, leading to social integration and sense of community (Calthorpe, 1993). In designing New Urbanist streets, the pedestrian is the main focus. Thus, streets are typically tree-lined, narrow and interconnected. Sense of safety is imperative, and a degree of surveillance is necessary for pedestrians to feel safe using streets and sidewalks (Jacobs, 1961). Therefore, streets that encourage lower driving speed limits and are well lit fit into New Urbanist theory. The mixture of residential and commercial properties can encourage residents to walk rather than

drive to make purchases or go to public places. This mixture of land uses enhances the walkability of a neighborhood that will in turn increase social integration, forming the bonds of “authentic community” (Audirac & Shermyen, 1994, p. 163).

Socio-demographic Features. Social ties of residents have been found to be impacted by residents' social and demographic characteristics, the number of residents in the neighborhood, and their subjective perception of their environment (Verbrugge & Taylor, 1980). Other studies in the literature have identified further life stage and socio-demographic features as influential factors on sense of community. These features include length of residency (Buckner, 1988; Chavis et al., 1986; Glynn, 1981; Skjaeveland, Garling, & Maeland, 1996) and homeownership (Davidson & Cotter, 1986; McMillan & Chavis, 1986). Number of children was also explored as an influential feature on sense of community (Buckner, 1988; Keller, 1968; Nasar & Julian, 1995; Riger & Lavrakas, 1981; Skjaeveland, Garling, & Maeland, 1996).

Riger and Lavrakas (1981) utilized the factors of length of residency, homeownership, and expected length of residency as indicators for “physical rootedness”, a term indicating the level of settlement a person has in his/her neighborhood. The study’s findings concluded that physical rootedness and social bonding are influential factors on residential community attachment.

The features of marital and parenthood status as well as age and gender were examined in Campbell and Lee’s (1992) study in relation to sense of community and neighborhood networks. This study found that residents with higher “familistic statuses” (i.e. married, more children) tend to have a higher level of neighborhood attachment and local social interaction. Therefore, they concluded that married people and families will therefore have higher social networks than their single childless counterparts. Women in this study were found to have larger

neighborhood networks than men. In addition, women were found to be more emotional and thus possess a higher responsibility in maintaining these networks. The study also found that age and neighborhood networks have a negative curvilinear relationship between each other. In other words, middle-aged adults possess a higher level of neighbor networks than their older or younger counterparts. Aging is deemed to be associated with a lower level of attachment and less social interactions.

Conceptual Framework

The conceptual framework for this study is derived from the theoretical foundations of New Urbanism and sense of community along with the relevant previous empirical studies. The conceptual model for this study is presented in Figure 5.

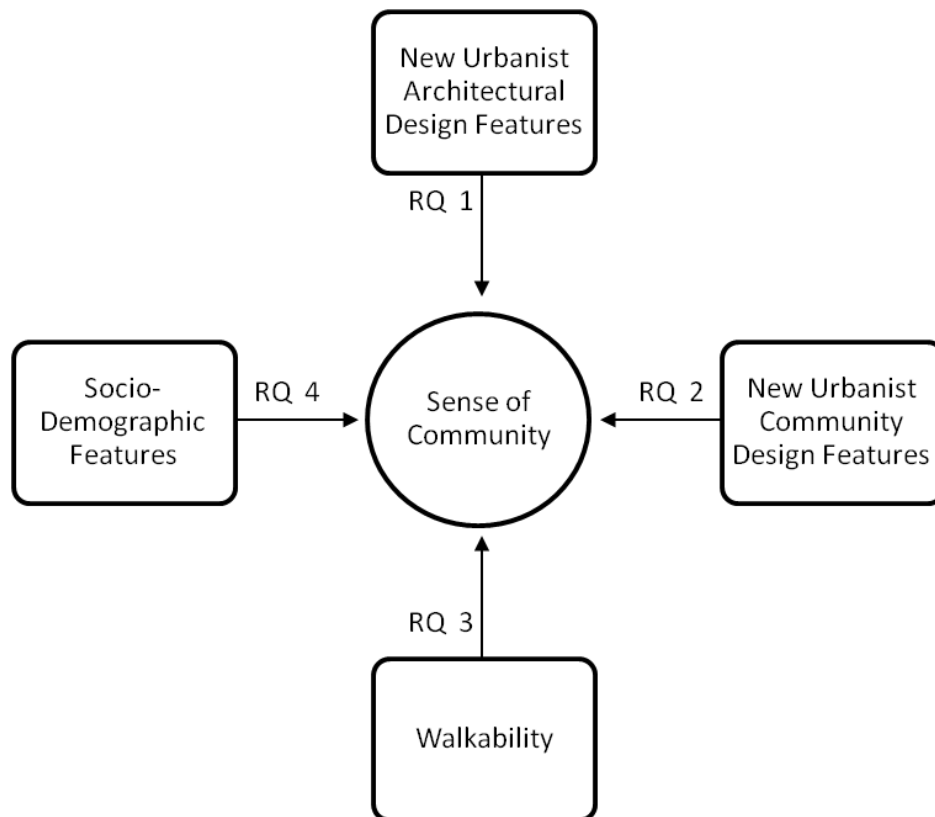


Figure 5. *Conceptual Model of the Study*

The independent variables are divided into four categories: (1) New Urbanist architectural design features, (2) New Urbanist community design features, (3) walkability, and 4) socio-demographic features. Specific independent variables derived from the previous empirical studies are categorized underneath these four divisions, and are further elaborated on in Chapter 3. The final dependant variable of sense of community is conceptualized by utilizing Skjaeveland, Garling, and Maeland's (1996) MMN. Based on the previous model and the research objectives defined in this study, the specific research questions to be tested are as follows:

- RQ 1. How do New Urbanist architectural design features influence sense of community in residents of a New Urbanist neighborhood?
- RQ 2. How do New Urbanist community design features influence sense of community in residents of a New Urbanist neighborhood?
- RQ 3. How does walkability influence sense of community in residents of a New Urbanist neighborhood?
- RQ 4. How do socio-demographic features influence sense of community in residents of a New Urbanist neighborhood?

CHAPTER 3

RESEARCH METHODS

The following chapter will examine the research methods used during this study. A description and rationale for utilizing the research design of case study as methodology is presented, along with the criteria for case selection. The case study will be reviewed and analyzed against New Urbanist principles. Further research methods including the population, sample, data collection instrument, measurement and analysis will be described as well.

Research Design and Rationale

The general goal of this study is to investigate the relationship of relevant New Urbanist features on the sense of community of residents living in a New Urbanist neighborhood. To accomplish this, four main research questions were developed. In answering these research questions, a survey method was chosen to be appropriate over other types of research methods such as in-depth interviews or observation. While interviews or observations offer more detailed information focusing on a smaller number of subjects, this study attempts to obtain broader findings of residents' sense of community in relation to New Urbanist design elements in their neighborhood.

Additionally, the study utilized a case study methodology to administer the survey by focusing on one specifically selected case of New Urbanist neighborhood. Case study as methodology is becoming exceedingly popular in fields such as urban planning, and is thus an appropriate choice for this type of investigation (Campbell, 2003). The strengths of case study as a research design are multiple. These advantages include the ability to focus on case(s) in their

real-life perspective, ability to explain relationships, potential to generalize and develop theory, and use of various sources of evidence and data (Groat & Wang, 2002; Yin, 2003).

There has been much debate over the validity of case study as methodology. One major critique against using case study as a research method is that it does not allow for scientific generalization. However, Yin (2003) contends that "scientific facts are rarely based on single experiments; they are usually based on multiple sets of experiments, which have replicated the same phenomenon under different conditions" (p. 10). External validity, which tests whether a study's findings are generalizable beyond the immediate case study, is a major barrier in conducting case studies (Yin, 2003). However, in the present case study, analytic generalization rather than statistical generalization can be claimed by employing an existing theory as a framework, collecting the empirical results of the case study, and extending the results to other situations such as other New Urbanist neighborhoods in the United States.

The present case study used a survey method in the following manners:

1. Focusing on a particular case study in Canton, Michigan in its real-life context, without any external control from the researcher.
2. Exploring the relationships present between New Urbanist design features and residents' sense of community.
3. Testing New Urbanist theory on the link of physical design to community experience.

Criteria for Case Selection

The case selected for this study is Cherry Hill Village (CHV) in Canton, Michigan. CHV, touted as Michigan's first TND neighborhood, was included in a list of pedestrian-friendly

neighborhoods in the Southeast Michigan area prepared by the Southeast Michigan Council of Governments (SEMCOG, 2010; Erkul, 2009). The criteria used to select this case study include:

1. Neighborhood location: CHV is reasonably located, enabling multiple site visits for documentation and data collection/survey distribution purposes.
2. Neighborhood type: CHV is a New Urbanist Greenfield development within the metropolitan area of a major city (Detroit).
3. Neighborhood accessibility: CHV does not possess any gates or walls restricting access to the researcher.
4. Overall design principles: CHV claims to incorporate the New Urbanist features discussed in Chapter 2.

The Site for the Case Study

The following section provides a detailed explanation of the selected site for the case study, Cherry Hill Village, Canton, Michigan, including its urban context, design intentions and development. In addition, its physical design attributes will be evaluated against New Urbanist principles.

Urban Context

Established in 1834, Canton Township lies within Wayne County in Southeast Michigan (see Figure 6 on the following page). The Township is located approximately 35 miles west of Detroit, bordered on the east by the city of Dearborn Heights, on the west by the city of Ann Arbor, and on the north by the city of Plymouth (Canton Township, 2009). Canton's history revolved mainly around farming prior to the 1960s. However, the increasing popularity of suburban living in the 1970s and emphasis on sprawl from the civic center led to exponential



Figure 6. *Google Map of Canton, MI (2012)*
 Source: <http://maps.google.com/>

growth of the Detroit metropolitan area according to the Canton Downtown Development Authority (CDDA) (2008). Today, Canton is deemed as one of the most rapidly growing communities in Michigan. Its population increased from a modest 5,313 residents in 1960 to 86,548 by 2015 according to the estimates obtained from Census Data and the Southeast Michigan Council of Governments (SEMCOG, 2011).

Canton's downtown district, located near Canton Center Road on the west, is comprised of properties running along both the north and south sides of Ford Road east of I-275 (Erkul, 2009). The district encompasses over 400 commercial properties, including but not limited to retail, financial institutions, restaurants, motels, sports and entertainment venues, apartment and condominium complexes (CDDA, 2008).

Distinct qualities of Canton's inhabitants that offer planning challenges for its future include its gradually aging population and decreasing average household size. These trends, obtained through Census data and the SEMCOG estimates, are consistent with the national movement. SEMCOG (2011) estimates that while only 13% of Canton households accommodate senior citizens over the age of 65 in 2000, this number is projected to increase to 36% by 2035. As for average household size, estimates anticipate a decrease from 2.77 in 2000 to 2.55 in 2035

(SEMCOG, 2011). Since 60% of the existing housing available in Canton is comprised of single-family homes, there is a distinct need for more appropriate planning for future growth (Erkul, 2009). Despite this, the number of housing units is steadily increasing, going from 28,430 in the year 2000 to 35,115 in 2010. Thus, the tasks that appear from these trends are: 1) to develop a variety of home sizes to accommodate the changing population, and 2) encourage urban growth towards the western boundaries of the township i.e. where natural elements are situated, consequently preserving both the rural and natural quality of the area.

To provide a solution to these issues, Canton Township executed a Planned Development District (PDD) alternative for residential areas in the late 1990s. This PDD aimed to "provide a variety of housing types, maintenance of open space, and creative design solutions for new and infill development" (CDDA, 2008). Located on the western side of Canton is the Cherry Hill Village Development area, a major PDD whose initiative is to encourage a high quality mixed-used development aiming to create a distinctive community (CDDA, 2008). The Cherry Hill Village Development area is composed of four distinctive neighborhood units neighboring the retail center on Cherry Hill Road. This study used Cherry Hill Village as its case study, which is part of the PDD (see Figure 7 on the following page). Figure 7 presents the concept plan for Cherry Hill Village. The research area for the present study is highlighted within the concept plan to indicate the neighborhood boundary used in this study.

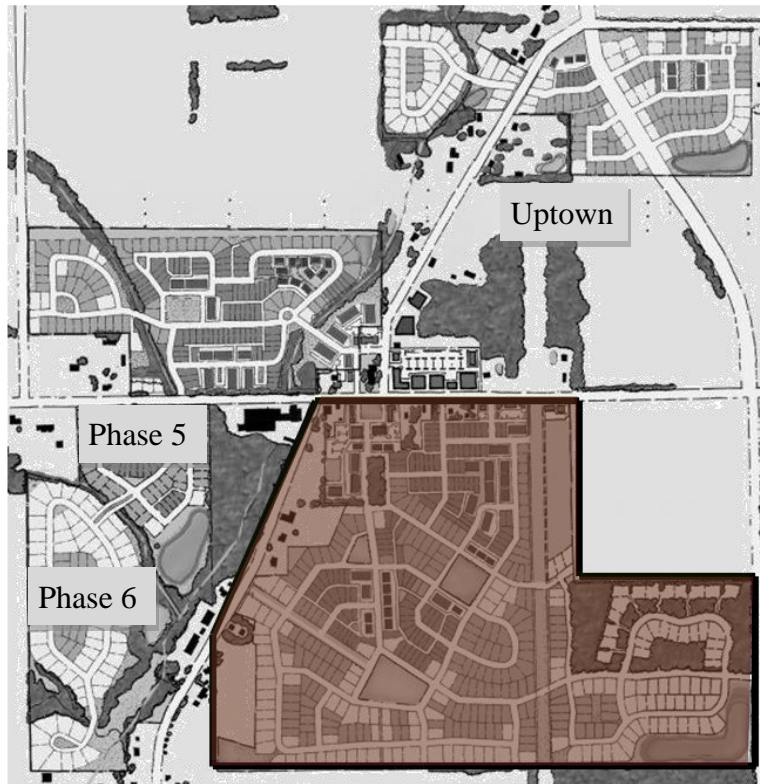


Figure 7. *Concept Plan of Cherry Hill Village Development*

Design and Development of Cherry Hill Village

Cherry Hill Village, situated at the intersection of Ridge Road and Cherry Hill Road, was one of two rural communities that housed the main population of Canton prior to the 20th century. The area contained a one-room schoolhouse, as well as an inn designed for people traveling between Ann Arbor and Detroit (CDDA, 2008). The community became the last one of Henry Ford's 19 "village industries" in 1944; these small rural "village industries" served as alternative accommodation to house small numbers of workers responsible for producing component parts for Ford vehicles manufactured in the Rouge Plant in Dearborn, Michigan (Segal, 2005). Presently, Cherry Hill boasts the first church erected in the area, built in 1934 on Ridge Road, as well as the 1876-built Cherry Hill school. Both these developments are designated as local and state historic sites and are open to the public (CHS, 2010). In addition to

these sites, the area is surrounded by large acres of farmland, a result of its agricultural history. The demand for urban growth in the area consequently included these farmlands as part of the Cherry Hill Village Development district plan; the plan is comprised of several Greenfield developments bordering the historic junction and properties of the Cherry Hill Area.

As previously mentioned, westward development was encouraged, and thus the Cherry Hill Village PDD anticipated creating a new traditionally inspired town, possessing a lively cultural and village center as well as numerous living and employment options for over 10,000 Canton residents in 5-10 years (CDDA, 2008). As a result, the design and development of the Cherry Hill Village area began.

Developed by one of the major builders of the region, Biltmore Properties Corporation, Cherry Hill Village (CHV) is a Greenfield neighborhood project aiming to be fully built on 338 acres of land. Biltmore conceptualized CHV in the mid-1990s, backing up their idea with deep research into the principles of New Urbanist design. Following this research, architecture firm Looney Ricks Kiss Architects, specialists in traditional neighborhood design, were consequently hired to create the master plan for the area (Lydon, 2006). In 2000, the plan for CHV was awarded an Outstanding Planning Project Award from the Michigan Society of Planning. The project proposes several phases to accommodate a diverse set of residential neighborhoods. To date, the first two phases of CHV are complete with homes fully occupied. Phase three is almost complete with most homes sold out; the fourth phase of the construction project gained final engineering approval in June 2010, adding thirty-three (33) new homes to the area as well as a pocket park located along one of the main streets. Developments for phase 5 and possibly phase 6 are scheduled to go underway within approximately the next year. Furthermore, the community has a defined civic center housing a performing arts theater, retail stores and civic

institutions. Three of the major leading New Urbanist design offices in the state took part in either the design or consultation on the design of CHV; despite slight differences in their design approaches, they all aimed to create a TND community. Table 4 presents the project profile of Cherry Hill Village according to the official Cherry Hill Village website.

Table 4. *Project Profile of Cherry Hill Village**

Element	Description
Project Type	Traditional Neighborhood Development Mixed use (residential, commercial retail and cultural center)
Building Types	Single family homes Condominiums
Location	Canton Township, Michigan
Developer	Originally David Biltmore Properties Corporation along with Looney Ricks Kiss Architects, currently Livonia Builders
Project Size	338 acres (concept plan/all phases) 163 acres (phases 1-4)
Households	Approximately 677 to date

*Information Source: <http://mychv.com/>

Design Intentions of Cherry Hill Village

The design intent of the CHV PDD is to resemble a small town, possessing mixed land-uses with a commercial core and various housing types in four different neighborhoods. CHV is marketed to prospective residents as a TND neighborhood, a point stressed heavily in the marketing materials produced by its developers (Biltmore, 1999). The New Urbanist features promoted by the marketing materials are as follows:

Traditional neighborhood design. CHV is marketed to possess an overall similarity to traditional US towns, employing the design principles of TND (see Figure 8 on the following page).



Figure 8. *Concept Sketch from CHV Marketing Materials*
Source: <http://mychv.com/>

Streetscape and walkability. CHV is designed with an interconnected hierarchical organization of its streets. In addition, pedestrian-friendly sidewalks, pathways, and bicycle trails are included in the design. Houses are located within close proximity to the village center. Hidden rear facing garages and side alleys improve the walkability factor of the streetscape. The architectural details in the various housing types provide the streetscape with a vibrant aesthetic appeal contrasted to the uniformity of the typical suburban neighborhood. Parks and common gathering spaces are centrally located, with neighborhoods surrounding the commercial hub of the development.

Diverse home styles. The houses in CHV represent several distinct residential unit styles. Larger homes are placed on the outskirts of the neighborhoods, with smaller homes situated closer to the city center. Each residential unit type is defined in accordance to lot size, as well as

spatial relationship between dwelling, building, lot, garage and street. The architectural diversity of the various home styles adds to the visual appeal of the streetscape (see Figure 9).



Figure 9. *Diverse Home Styles in CHV*
Photographs taken by author

Civic center. The main civic center is centrally located at the crossroads of Cherry Hill Road and Ridge Road. This junction possesses a variety of commercial properties, including but not limited to restaurants, retail stores, salons, and the CHV Theatre (see Figure 10). The village square, inspired in design by the historic schoolhouse, connects the CHV community to the civic center, aiming to be the vibrant core of social, civic and special events in the area. Recreational activity is encouraged through the prevalence of trails running through the community, as well as centrally located parks within the CHV community.

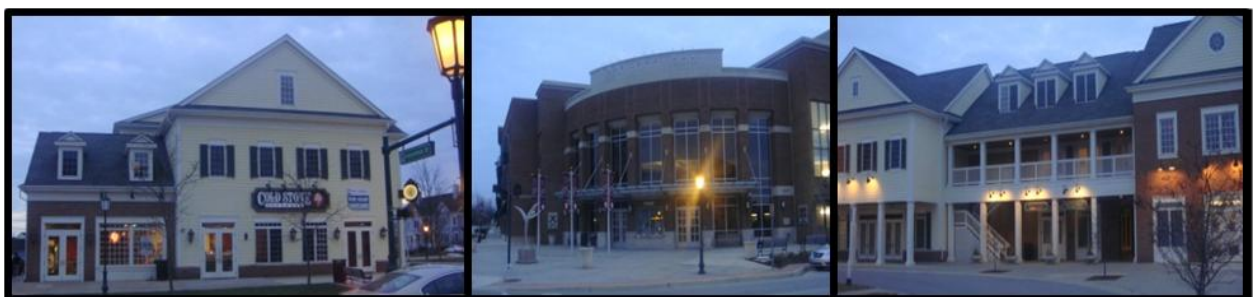


Figure 10. *Commercial Properties in CHV's Civic Center*
Photographs taken by author

Evaluation of CHV Physical Design in Relation to New Urbanist Principles

The previous section provided an overview of the design intentions of CHV as endorsed by various marketing materials created by its developers. This section will evaluate the architectural and community design features of CHV against the New Urbanist principles identified in Chapter 2. Each New Urbanist design element is evaluated based on the design intentions and features of CHV, as well as the actual design outcomes.

Architectural Design Features. Under the New Urbanist element of architectural and site design, CHV gains its inspiration from the area's local history, climate, natural environment and building practice. Architecturally, many design features of CHV homes show strong inspirations from traditional forms of neighborhood development in the US. Such features include street facing porches, variety of home colors, and rear facing garages as illustrated by the top row in Figure 11. Additional features consist of white picket fences, the inclusion of outdoor living spaces and houses located closer to the street with a shallow setback to bridge public and private spaces (see bottom row in Figure 11). These details lend CHV a definite identity.



Figure 11. *New Urbanist Architectural Design Features in CHV*
Photographs taken by author

Community Design Features. The New Urbanist design elements which fall under the category of community design features include mixed land-use, well-defined, density and public spaces. In addition, the concept of walkability requires certain design features to be included to facilitate it, and is thus classified under this category. The design element of mixed land-use is partially fulfilled in CHV. Though its design intent was to provide a vibrant city center, the declining economy had a negative effect on this goal. Therefore, there is a distinct lack of variety in retail stores and businesses, with residents still vehicle-dependent for specific purchase needs.

Despite that, CHV does provide a variety of housing types to encourage diversity (of population) by attracting residents of different demographic statuses. Figure 12 illustrates the variety of home types in CHV, including single-family homes and condominiums. Additionally, Table 5 on the following page presents the residential units available at CHV, from largest to smallest, as labeled and described in accordance to the CHV Homeowner's Association (2010).



Figure 12. *Single-family Homes and Condominiums in CHV*
Photographs taken by author

Though not explicitly addressed in the marketing materials, CHV does employ a well-defined civic center, its most public space on one of the most integrated streets of Canton. This in turn increases accessibility to the commercial and socially vibrant public space to the larger Canton community. However, the edge of the neighborhood is not as well defined, with parks not defined by buildings but rather aligned with homes; these homes do not provide a clear sense

of enclosure. The civic center is more defined than the parks, but still limited, as only one side of the road is aligned with physical buildings. That being said, as opposed to the low-density subdivisions typical of the Canton area, CHV aims to provide a more compact neighborhood with smaller lot sizes and a higher density.

Table 5. *Residential Units in CHV**

Unit Type		Description
Single-Family Home	Estate Home	7,500 SF minimum lot size, 75'-80' wide, 120'+ deep (typical), multiple outdoor living spaces, side entry, set back or rear motor court yard entry to garage
	Village Home	5,000 SF lot size, 55'-65' wide, 120' deep (typical), side entry, set back or rear lane entry to garage
	Cottage Home	3,000 SF lot size, 40'-45' wide, 100'-120' deep (typical), rear lane garage entry (per plan)
Condominium		First or second level living, every home has an attached garage, rear lane garage entry (per plan)

*Information Source: <http://mychv.com/traditional-neighborhood-development/>

Walkability. CHV addresses walkability as a New Urbanist design element by paying careful attention to the pedestrian. Well-designed sidewalks, aesthetically appealing tree-lined streetscapes, hidden garages, shallow setbacks, and porches enhance walkability (see Figure 13). In addition, all houses are located within a 10-minute walking distance to retail stores and parks.



Figure 13. *Walkability in CHV*
Photographs taken by author

As a side note, CHV does not attempt to employ any design traits of TOD, which is quite apparent in its lack of public transit.

In Kim, Lee, and Bell's (2008) study, the walkability of CHV was also evaluated. The findings of that study indicate that the connectivity of the sidewalks in CHV were excellent, with sidewalks measuring approximately 3.2 feet wide. Although the connectivity of the sidewalks were deemed more than sufficient, they were not marked on the roads. The upper area of CHV, possessing the commercial civic center and public spaces, is separated from the lower area (mainly housing single-family homes and condominiums) by a main road. Pedestrian signals and the straight road design help enhance the safety for pedestrians alongside this main road. Additionally, the relatively narrow roadways tend to reduce the speed of travelling vehicles, enhancing the safety of walking in CHV (Kim, Lee, & Bell, 2008).

The previous evaluation of New Urbanist principles against the design intentions and actual outcomes of CHV support its use as a case study for this research. The following section reviews the survey research method including the sample of the study as well as data collection procedures, instrumentation and measurement.

Survey Method

Population and Sample

The target population for the present study was current residents of CHV. Since the main purpose of the study is to investigate the relationship between New Urbanist design elements and sense of community for residents in a New Urbanist development, a purposive sampling technique was employed to target this specific group.

Data Collection Procedures

Quantitative data was collected from study participants using a standardized online survey method. Prior to data collection, a description of the study as well as the data collection instrument were submitted to the Institutional Review Board (IRB) of Michigan State University on March 17, 2011 for review and approved on April 1, 2011 (see Appendix A). Upon approval, the study then utilized a revised version of the Dillman Total Design Survey Method for data collection (Dillman, 1978). The Dillman Total Design Survey Method was revised by applying some of its suggestions to an online survey in order to enhance response rates, chiefly in the form of reminders sent to urge residents to participate in the survey. Online surveys often yield quicker response rate and are more cost-effective than their paper counterparts, and were thus selected as an appropriated data collection procedure for this study (Hewson et. al, 2003; Porter & Whitcomb, 2003).

SurveyMonkey, a web-based survey software and questionnaire tool, was used to collect responses from participants. Residents were notified of the survey in their weekly online community newsletter, as well as on the CHV official website and related social media network. Due to privacy concerns, the researcher worked with a member from the CHV Homeowner's Association to act as a representative for recruiting participants and implementing the survey. A total of 516 surveys were sent out to residents between the dates of April 17, 2011 and May 13, 2011. 157 residents responded to the survey. However, only fully completed surveys were included in the data analysis, for a total of 136 completed surveys. Overall, the response rate was approximately 26%.

Adhering to the guidelines set forth by the IRB, participants were informed by the researcher of the entirely voluntary nature of participating the survey, as well as the complete

confidentiality of responses. Additionally, participants were made aware that their anonymity would be fully protected and that their consent is given upon completion of the online survey. The e-mail introduced the researcher and research project and provided a link to connect to the online survey. Once at the survey website, a cover letter clearly describing the purpose of the study, the reasons why the respondents' opinions were wanted and the merits of the study was provided. According to the Dillman method, a reminder postcard should be sent to participants one week after the initial mail-out, followed by another reminder at the three weeks and seven weeks points (Dillman, 1978). A revised version of this was conducted in the form of sending out a follow-up e-mail and reminders on CHV's official website and social media site approximately one and three weeks after the initial notice.

Instrument

Prior to the survey being administered, a pilot test of the survey instrument was conducted to determine ease of completion, readability and clarity. Based on the feedback gained from the pilot study, the survey questionnaires were revised to clear up any ambiguity. The questionnaire of the present study was developed in three stages. First and foremost, the measured variables were identified based on the case study overview and review of previous studies in Chapter 2. Next, various survey instruments employed in relevant research studies were reviewed. The review yielded two studies that were utilized to develop the survey for this study. Erkul's (2009) cross-cultural analysis of New Urbanist neighborhoods in the US and Turkey study utilized a survey based on four previous surveys, including a questionnaire implemented to measure and compare sense of community in a New Urbanist and a conventional neighborhood (Kim & Kaplan, 2004), the Detroit Area Study survey instrument measuring quality of life in the Detroit metro area, an abridged version of Putnam's (1993) survey

instrument measuring levels of social capital, and a short version of the World Values Survey instrument. Sukolratanamettee (2006) employed an instrument utilizing Skjaeveland, Garling, and Maeland's (1996) MMN in a comparative study exploring pedestrian-oriented design; this is related to the instrument utilized in this study as the MMN is used to compute the sense of community score of respondents. Lastly, combining these previous studies' instruments and relevant research into three sections produced the final survey instrument. The first two sections cover the New Urbanist variables and include the MMN. The final section revealed socio-demographic information. The survey questionnaire is presented in Appendix B.

Measurement

The independent variables are derived from previous empirical studies and are divided into four categories: (1) New Urbanist (NU) architectural design features, (2) New Urbanist (NU) community design features, (3) walkability, and (4) socio-demographic features. The dependent variable in this study is the overall sense of community. The following section explains how each of these variables was measured.

NU Architectural Design Features. The variables within this category are measured by asking respondents to rate the nine variables within this group in promoting sense of community within CHV on a 5-point scale: (5) Extremely Important, (4) Very Important, (3) Important, (2) Somewhat Important or (1) Not Important. The scale utilized within these questions is derived from the previous studies indicated in the creation of the instrument. The nine variables include traditional architecture, outdoor living space, street facing porches, variety of colors, white picket fences, custom design, rear-facing garages, large windows, and open floor plan.

NU Community Design Features. Variables within this category include high density, parks and public greens, short house setback, and mixture of housing types. Respondents were

asked to rate how important the variables were in promoting their sense of community in CHV on a 5-point scale: (5) Extremely Important, (4) Very Important, (3) Important, (2) Somewhat Important or (1) Not Important.

Walkability. Walkability is measured in this study in two ways. The first is by asking residents on whether they need a car to get around the neighborhood, with the option of answering either yes or no. The second is by frequency of walking occurrence per week either 1) to go to public places, 2) to make a purchase, and 3) for pleasure/exercise on a 4-point scale: (1) Less than once a week, (2) Few times a week, (3) Once a day, or (4) Several times a day.

Socio-Demographic Features. The variables measured within this group include respondent gender and age, marital status, level of education, household income, race, housing unit type, housing tenure, length of residency and number of children. Respondent's gender, marital status, level of education, race, housing unit type, and housing tenure are categorical variables. Respondent's age, household income, length of residency and number of children are continuous variables. Respondents are asked to specify their age, gender, marital status, number of children and length of residency in years and months. Level of education is measured by selecting the highest level of education completed. Household income is approximate gross income before tax deductions from all sources in the previous year, by selecting categories of less than \$20,000 a year to over \$100,000. Housing unit type is determined by selecting either single-family home or condominium. Housing tenure is measured by selection of the categories of rent or own, with an option to specify other.

Sense of Community. The dependent variable within this study is the overall sense of community score as indicated by Skjaeveland, Garling, and Maeland's (1996) level of neighboring (see Table 6 on the following page). The level of neighboring (i.e. sense of

community) is measured using the 14-item Multidimensional Measure of Neighboring (MMN, see Table 6). The 14 items are categorized into four subscales. Items 1-4 and 6-12 are to be measured based on a 5-point scale: (1) Strongly Disagree, (2) Disagree, (3) Not Sure, (4) Agree, and (5) Strongly Agree. Items 5, 13, and 14 are measured by the quantity of contacts recorded ranging from none to 6 and over. The sense of community items presented in the MMN are assigned a score of 5 for the most positive answer choice and a score assignment of 1 for the least positive answer choice. In other words, an answer choice of Strongly Agree would yield a score of 5, while an answer choice of Strongly Disagree would yield a score of 1. Negative response questions were scored conversely, with a score of 1 being assigned to the Strongly Agree answer choice and a score of 5 being assigned to the Strongly Disagree answer choice. The reverse coded items include items 7, 8, 9, 11 and 12 (see Table 6 on the following page). The total score obtained from the level of neighboring measures the final level of sense of community.

Table 6. *Skjaeveland, Garling, and Maeland's (1996) Multidimensional Measure of Neighboring (MMN)*

Factor	Item
Supportive Acts of Neighboring	1. If I need a little company, I can stop by a neighbor I know. 2. If I have a personal crisis, I have a neighbor I can talk to. 3. I have made new friends by living here. 4. If I don't have something I need for my cooking, I can borrow it from a neighbor. 5. How many neighbors do you visit now and then? 6. How often do you help your neighbors with small things, or they help you?
Neighbor Annoyance	7. Noise, which my neighbors make, can occasionally be a big problem.* 8. How often are you irritated with some of your neighbors?*
Neighborhood Attachment	9. In this house I never feel quite safe.* 10. I feel strongly attached to this residence. 11. I don't feel at home in this neighborhood.* 12. I would have better contacts with friends, family, etc., if I live in another part of town. *
Weak Social Ties	13. How many of your closest neighbors do you typically stop and chat with when you run into them? 14. How many of your neighbors who live near you do you say hello to when you meet them?

* Denotes items with reverse scoring.

Quantitative Data Analysis

Data collected from the distributed surveys was initially analyzed by obtaining preliminary statistics through the use of statistical software, specifically IBM Statistical Package of the Social Sciences (SPSS) V. 20. Descriptive statistics were gathered to determine the distributional characteristics of each variable including the mean, standard deviation, frequencies and percentage distributions. The MMN utilized in this research was analyzed using the principle-component analysis method, a data reduction technique used to identify statistical explanatory factors of measure variations. Reliability tests were run on the derived factors as well as on the overall sense of community measure to test internal consistency. Further analysis included multiple regression analysis, along with an examination of the correlations among

variables, to determine whether, if any, of the independent variables have an effect on the dependent variable. Additionally, one-way ANOVA and t-tests were conducted to explore further relationships. The conceptual model of the study assumes that the independent variables will have a direct positive effect on sense of community. The null hypotheses of the study as well as the applied statistic method in data analysis are presented in Table 7.

Table 7. Null Hypotheses and Applied Statistical Methods

Null Hypothesis		Applied Statistical Method
NH 1	The New Urbanist architectural design features have no direct influence on sense of community in residents of a New Urbanist neighborhood	Pearson Correlations, Multiple Regression
NH 2	The New Urbanist community design features have no direct influence on sense of community in residents of a New Urbanist neighborhood.	Pearson Correlations, Multiple Regression
NH 3	Walkability has no direct influence on sense of community in residents of a New Urbanist neighborhood among residents' walking occurrence per week for pleasure/exercise, to make a purchase, and to go to public places.	One-way ANOVA
NH 4	Socio-demographic features have no direct influence on sense of community in residents of a New Urbanist neighborhood.	Independent Samples T- Test, One-way ANOVA

CHAPTER 4

RESULTS

This chapter presents the findings on the relationship of the perceived importance of NU architectural design features, perceived importance of NU community design features, walkability and respondent socio-demographic features on CHV's residents' sense of community based off of the survey results. The chapter begins with a preliminary analysis of the study's variables. Next, the factor analysis of the sense of community items is given. Lastly, findings from the regression analyses, one-way ANOVA and t-tests conducted are provided.

Preliminary Analyses

Independent variables were included under the categories of NU architectural design features, NU community design features, walkability, and socio-demographic characteristics. An overview of the study participants is initially presented in this section, followed by an examination of each independent variable through descriptive statistics to obtain basic traits of the data.

Respondent Socio-Demographic Characteristics

Table 8 on the following page presents the frequencies and percentage distributions for the socio-demographic characteristics of the sample: respondent gender and age, marital status, level of education, household income, race, housing unit type, housing tenure, length of residency and number of children are included.

Table 8. *Percentage Distribution of Socio-Demographic Characteristics*

Socio-Demographic Characteristics		Frequency	%
Respondent Gender	Male	52	38.5
	Female	83	61.5
	Total	135	100
Respondent Age	20s	14	10.8
	30s	52	40
	40s	39	30
	50s	13	10
	60+	12	9.2
	Total	130	100
Marital Status	Never Married	4	3
	Married	122	90.4
	Divorced	6	4.4
	Separated	1	0.7
	Widowed	2	1.5
	Total	135	100
Level of Education	Completed grade school	1	0.7
	Completed high school	16	11.9
	Completed college	65	48.1
	A graduate degree	53	39.3
	Total	135	100
Household Income	Up to \$59,999	6	4.4
	\$60,000 to \$79,999	16	11.9
	\$80,000 to \$99,999	18	13.3
	\$100,000 and over	71	52.6
	Prefer not to answer	24	17.8
	Total	135	100
Race	Caucasian	121	93.1
	African-American	2	1.5
	Asian	3	2.3
	Prefer not to answer	4	3.1
	Total	130	100
Housing Unit Type	Single-family home	117	86.7
	Condominium	18	13.3
	Total	135	100
Housing Tenure	Own	129	95.6
	Rent	5	3.7
	Total	134	100
Length of Residency	Less than 1 year	5	3.8
	1-3 years	41	31.3
	4-6 years	45	34.3
	7 or more years	40	30.6
	Total	131	100

Table 8. (*cont'd*)

Number of Children	0	41	30.4
	1-2	69	51.1
	3-4	25	18.5
	Total	135	100

The dominant gender in the survey respondents were female (female: $n=83$, 61.5%, male: $n=52$, 38.5%). The average age of survey respondents was 40.95, ranging from 23-71 years old. The majority of respondents were between 30-49 years old, with 40% of participants in their 30s ($n=52$), and 30% in their 40s ($n=39$). The marital status of the majority of the sample was married ($n=122$, 90.4%). Almost half the sample ($n=65$, 48.1%) have completed college, with 39.3% ($n=53$) possessing a graduate degree, compared to only 24.5% of the population in Michigan possessing a Bachelor's degree or higher (U.S. Census Bureau, 2009). Over half of the sample ($n=71$, 52.6%) reported average annual household income levels of \$100,000 and over, more than double the state average of \$45,254 (U.S. Census Bureau, 2009). Additionally, 18 participants (13.3%) reported their income as \$80,000-\$99,999, 16 (11.9%) reported their income as \$60,000 to \$79,999, and only 6 (4.4%) reported their income as up to \$59,999. However, 24 respondents (17.8%) preferred not to answer this question. In terms of race, the majority of respondents ($n=121$, 93.1%) were Caucasian. The majority of respondents live in single-family homes ($n=117$, 86.7%), with the remaining 18 (13.3%) living in condominiums as their housing type. Furthermore, the majority of respondents own their homes ($n=129$, 95.6%), with only 5 (3.7%) currently renting. A minority of the respondents ($n=5$, 3.8%) have been living in CHV for less than a year. Slightly under a third of the sample have been living in CHV for 1-3 years ($n=41$, 31.3%), while 30.6% ($n=40$) have resided there for over 7 years. Over half the sample ($n=69$, 51.1%) had 1-2 children living with them, and 30.4% ($n=41$) did not have any children currently living with them.

Perceived Importance of New Urbanist Architectural Design Features in Promoting SOC

Table 9 describes the frequency and percentage distribution of residents' perceptions on the importance of NU architectural design features in promoting their sense of community. These variables include perceptions on 1) traditional architecture, 2) outdoor living space, 3) street facing porches, 4) variety of colors, 5) white picket fences, 6) custom design, 7) rear facing garages, 8) large windows, and 9) open floor plan.

Table 9. *Percentage Distribution of Perceived Importance of NU Architectural Design Features in Promoting SOC*

Variables	Scale	Frequency	%	Mean	SD
Traditional Architecture	1 Not Important	6	4.4	3.593	1.095
	2 Somewhat Important	16	11.9		
	3 Important	35	25.9		
	4 Very Important	48	35.6		
	5 Extremely Important	30	22.2		
Outdoor Living Spaces	1 Not Important	8	5.9	3.370	1.164
	2 Somewhat Important	25	18.5		
	3 Important	37	27.4		
	4 Very Important	39	28.9		
	5 Extremely Important	26	19.3		
Street Facing Porches	1 Not Important	7	5.2	3.740	1.146
	2 Somewhat Important	13	9.6		
	3 Important	29	21.5		
	4 Very Important	45	33.3		
	5 Extremely Important	41	30.4		
Variety of Colors	1 Not Important	12	8.9	3.385	1.240
	2 Somewhat Important	22	16.3		
	3 Important	32	23.7		
	4 Very Important	40	29.6		
	5 Extremely Important	29	21.5		
White Picket Fences	1 Not Important	34	25.2	2.570	1.296
	2 Somewhat Important	39	28.9		
	3 Important	26	19.3		
	4 Very Important	23	17.0		
	5 Extremely Important	13	9.6		
Custom Design	1 Not Important	6	4.4	3.822	1.184
	2 Somewhat Important	16	11.9		
	3 Important	24	17.8		
	4 Very Important	39	28.9		
	5 Extremely Important	50	37.0		

Table 9. (*cont'd*)

Rear Facing Garages	1 Not Important	23	17.0	3.141	1.436
	2 Somewhat Important	27	20.0		
	3 Important	27	20.0		
	4 Very Important	24	17.8		
	5 Extremely Important	34	25.2		
Large Windows	1 Not Important	11	8.1	3.185	1.134
	2 Somewhat Important	24	17.8		
	3 Important	48	35.6		
	4 Very Important	33	24.4		
	5 Extremely Important	19	14.1		
Open Floor Plan	1 Not Important	25	18.5	3.044	1.376
	2 Somewhat Important	24	17.8		
	3 Important	31	23.0		
	4 Very Important	30	22.2		
	5 Extremely Important	25	18.5		

N= 135

The results indicated that respondents generally deemed all nine variables to be important in the promotion of their sense of community. Regarding traditional architecture, 35 (25.9%) evaluated it to be important, with over half the respondents rating it as being very important ($n=48$, 35.6%) or extremely important ($n=30$, 22.2%). Outdoor living spaces were rated as important by 27.4% ($n=37$), very important by 28.9% ($n=39$) and extremely important by 19.3% ($n=26$). Over 60% of respondents rated street facing porches as very important ($n=45$, 33.3%) or extremely important ($n=41$, 30.4%).

Having a variety of colors was considered important in the promotion of their sense of community by 32 respondents (23.7%), with just over half of the sample rating it as very important ($n=40$, 29.6%) and extremely important ($n=29$, 21.5%). A majority of the respondents (65.9%) evaluated custom design to be very important ($n=39$, 28.9%) and extremely important ($n=50$, 37%) in promoting their sense of community. One-fifth ($n=27$, 20%) of the sample rated rear facing garages as somewhat important and one-fifth ($n=27$, 20%) rated it as important in promoting sense of community. Additionally, 24 (17.8%) rated this feature as very important and

34 (25.2%) rated it as extremely important in promoting their sense of community. The perceived importance of large windows in the promotion of sense of community were considered to be important by 35.6% of respondents ($n=48$), with 33 (24.4%) rating this feature as very important and 19 (14.1%) as extremely important. Lastly, over one-fifth of respondents (23%) rated having an open floor plan in promoting their sense of community as important, while approximately 40% rated it as very important ($n=30$, 22.2%) and extremely important ($n=25$, 18.5%).

Of the nine NU Architectural design features, custom design was reported as most important in promoting residents' sense of community, with a mean of 3.822, followed by street facing porches with a mean of 3.740 and traditional architecture with a mean of 3.593. Though still being perceived as important in promoting sense of community, having an open floor plan ($M=3.044$) and white picket fences ($M=2.57$) had the lowest ratings of all the variables.

Perceived Importance of New Urbanist Community Design Features in Promoting SOC

Table 10 on the following page presents frequency and percentage distribution of residents' perceptions on the importance of NU community design features in promoting their sense of community. The four attributes include 1) high density, 2) parks and public greens, 3) short house setback, and 4) mixture of housing types.

Generally, the NU community design variables rated lower than the NU architectural design variables. High density was rated as not important in promoting sense of community by approximately one-quarter ($n=34$, 25.2%) of the sample, with only 20 respondents (14.8%) rating this feature as very important and 4(3.0%) as extremely important. A majority of the respondents (80.8%) however rated parks and public greens as very important ($n=53$, 39.3%) and extremely important ($n=56$, 41.5%) in promoting sense of community. Having a short house

setback was viewed as not important in promoting sense of community by 27.4% ($n=37$) of respondents, with just over one-fifth (23.7%) rating it as important and very important ($n=28$, 20.7%). Having a mixture of housing types was rated as not important in promoting sense of community by 37% of respondents ($n=50$), somewhat important by 24 (17.8%), and important by 31(23%). Slightly over one-fifth (22.2%) of respondents rated having a mixture of housing types as very important ($n=20$, 14.8%) and extremely important ($n=10$, 7.4%) in promoting sense of community.

Out of the four NU community design variables, parks and public greens were evaluated as the most important in promoting sense of community, with a mean of 4.178. The lowest rating was for the importance of having a mixture of housing types in promoting sense of community, with a mean of 2.378.

Table 10. *Percentage Distribution of Perceived Importance of NU Community Design Features in Promoting SOC*

Variables	Scale	Frequency	%	Mean	SD
High Density	1 Not Important	34	25.2	2.467	1.112
	2 Somewhat Important	32	23.7		
	3 Important	45	33.3		
	4 Very Important	20	14.8		
	5 Extremely Important	4	3.0		
Parks & Public Greens	1 Not Important	1	0.7	4.178	.854
	2 Somewhat Important	4	3.0		
	3 Important	21	15.6		
	4 Very Important	53	39.3		
	5 Extremely Important	56	41.5		
Short House Setback	1 Not Important	37	27.4	2.689	1.346
	2 Somewhat Important	24	17.8		
	3 Important	32	23.7		
	4 Very Important	28	20.7		
	5 Extremely Important	14	10.4		

Table 10. (cont'd)

Mixture of Housing Types	1 Not Important	50	37.0	2.378	1.315
	2 Somewhat Important	24	17.8		
	3 Important	31	23.0		
	4 Very Important	20	14.8		
	5 Extremely Important	10	7.4		

N= 135

Walkability

Respondents were asked if they were dependent on their vehicle to get around the neighborhood as one measure of walkability. Percentage and frequency distributions are presented in Table 11 on the following page.

Table 11. *Percentage Distribution of Vehicle Dependency*

Variable	Scale	Frequency	%
Vehicle Dependent	No	115	85.2
	Yes	20	14.8
	Total	135	100

The results indicate that the majority of respondents ($n=115$, 85.2%) did not need their car to get around the neighborhood. Due to this, this variable was not used in further analyses.

Additionally, frequency and percentage distributions were obtained for the frequency of walking occurrences per week by residents either 1) to go to public places, 2) to make a purchase, and 3) for pleasure/exercise and are presented in Table 12.

Table 12. *Percentage Distribution of Walking Occurrence*

Variables	Scale	Frequency	%
For Pleasure/Exercise	1 Less than Once a Week	24	17.8
	2 Few Times a Week	75	55.6
	3 Once a Day	31	23.0
	4 Several Times a Day	5	3.7
	Total	135	100
To Make a Purchase	1 Less than Once a Week	127	97.7
	2 Few Times a Week	3	2.3
	Total	130	100

Table 12. (*cont'd*)

To Go to Public Places	1 Less than Once a Week	50	37.0
	2 Few Times a Week	69	51.1
	3 Once a Day	15	11.1
	4 Several Times a Day	1	.7
Total		135	100

Over one-fifth ($n=31$, 23%) of respondents walked once a day for pleasure/exercise, and over half ($n=75$, 55.6%) walked a few times a week. The majority of respondents ($n=127$, 97.7%) walked less than once a week to make a purchase. Slightly over half ($n=69$, 51.1%) walked a few times a week to go to public spaces, while 50 (37%) walked less than once a week. Overall, walking for pleasure/exercise was the most frequent among respondents.

Sense of Community

The dependent variable in this study is Sense of Community (SOC) as indicated by the overall Level of Neighboring score computed from Skjaeveland et al.'s (1996) 14-item Multidimensional Measure of Neighboring (MMN).

Factor Analysis and Reliability Test

Factor analysis, a method used to reduce a large number of interrelated variables to reveal a smaller number of latent or hidden dimensions, was utilized to obtain the relevant factors responsible for statistically explaining variations of measures from Skjaeveland et al.'s (1996) 14-item MMN. Specifically, the data-reduction technique used in the present study is principal-component analysis, which analyzes the total variance of the variables (Tinsley & Tinsley, 1987). The initial factor extraction yielded three factors with eigenvalues greater than 1.00. The first factor accounted for 44.63% of the variance, followed by the second and third factors explaining 13.55% and 7.9% respectively.

After the initial factor extraction, factors were rotated using the Varimax with Kaiser Normalization procedure, arguably considered the best of the orthogonal rotation procedures (Tinsley & Tinsley, 1987). This was done in order to determine the factor loadings for each variable and give more meaning to the different factors. Next, reliability analysis using Cronbach's alpha was conducted to test the internal consistency of the three rationally derived SOC factors. Table 13 on the following page presents the results of the rotated factor analysis as well as the results of the reliability test.

Items 1-6 of the MMN indicated high positive loading on the first factor, ranging from 0.834-0.716. The second factor included items 11 and 12, each indicating high loadings of .811 and .720 respectively. Additionally, item 10 had high positive loading on the second factor (.701) as well. The third factor included items 7-8, which indicated high positive loadings, .641 and .726 respectively, as well as items 13-14, showing high positive loadings of .657 and .653 respectively. Item 9 did not show high loading on any of the factors, and thus was eliminated from the sense of community items.

Although the MMN indicates four separate dimensions of neighboring (Supportive Acts of Neighboring, Neighbor Annoyance, Neighborhood Attachment, and Weak Social Ties), the principal component analysis revealed only three factors underlying the measures. Based on the factor loadings, the first factor, Supportive Acts of Neighboring (SAN), and the second factor, Neighborhood Attachment (NA), remained the same. However, the remaining two factors were regrouped into one factor, Lack of Neighbor Annoyance (renamed to better reflect the reverse scoring) and Weak Social Ties (LNA&WST). All three individual factors indicated a high degree of internal consistency among the items on the scale, with coefficient alpha levels ranging from

.895 to .722. The coefficient for the first factor was .895; the means of the individual items ranged from 2.75 to 4.05.

Table 13. *Results of Factor Analysis and Reliability Test*

	Component			Mean	SD	Cronbach's Alpha
	1	2	3			
Supportive Acts of Neighboring				3.485	5.437	.895
Item 1. If I need a little company, I can stop by a neighbor I know.	.834					
Item 2. If I have a personal crisis, I have a neighbor I can talk to.	.833					
Item 3. I have made new friends by living here.	.773					
Item 6. I often ask help from my neighbors with small things, or they help me.	.739					
Item 5. How many neighbors do you visit now and then?	.734					
Item 4. If I don't have something I need for my cooking, I can borrow it from a neighbor.	.716					
Neighborhood Attachment				4.132	2.778	.866
Item 11. I don't feel at home in this neighborhood.		.811				
Item 12. I would have better contacts with friends, family, etc., if I lived in another part of town.		.720				
Item 10. I feel strongly attached to this residence		.701				
Lack of Neighbor Annoyance and Weak Social Ties				3.558	2.850	.722
Item 8. I am often irritated with my neighbors.			.726			
Item 13. How many of your closest neighbors do you typically stop and chat with when you run into them?			.657			
Item 14. How many of your neighbors who live near you do you say hello to when you meet them?			.653			
Item 7. Noise, which my neighbors make, can occasionally be a big problem.			.641			

Extraction Method: Principal Component Analysis

Rotation Method: Varimax with Kaiser Normalization.

The second factor resulted in a coefficient alpha of .866, with the means of the individual items ranging from 3.85 to 4.37. The means of the individual items in the third factor ($\alpha=.722$) ranged from 3.07 to 3. Since the alpha levels are considered above the acceptable level, they were retained to calculate the overall SOC variable.

In preparation for further analyses, the Sense of Community (SOC) was measured from summated scale by assembling the 13 items resulting from the principal component analysis of the MMN within the three derived factors. Since the main purpose of this study is to explore the effects of the independent variables on sense of community as a whole, reliability analysis using Cronbach's alpha was also conducted on the overall SOC factor. Results of this analysis are presented in Table 14. The SOC variable, measured from summated scale, resulted in a coefficient alpha of .901, indicating a very high level of internal consistency. The mean SOC score was 3.655, indicating an average level of sense of community among survey respondents.

Table 14. *Results of Reliability Analysis for Sense of Community*

Variable	Minimum	Maximum	Mean	SD	Cronbach's Alpha
Sense of Community	1.54	4.77	3.655	.716	.901

N=133

Determinants of Sense of Community

In order to investigate the relative direct effects of the perceived importance of NU architectural design features, perceived importance of NU community design features, walkability and respondent socio-demographic characteristics on sense of community, further analyses were conducted including multiple regression, one-way ANOVA and t-test.

Effects of NU Architectural Design Features on Sense of Community

Correlations among Variables. In the proposed conceptual model of the study, it was assumed that the perceived importance of NU architectural design features would have an effect

on SOC. Table 15 on the following page displays correlation coefficients among the nine variables within this category (i.e. traditional architecture, outdoor living space, street facing porches, variety of colors, white picket fences, custom design, rear facing garages, large windows, and open floor plan) and sense of community.

Correlation coefficients ranged from .022 to .631. Among the NU architectural design variables, six showed significant correlations with SOC. Out of these six, street facing porches ($r = .301, p < .01$), had the highest correlation with SOC, followed by variety of colors ($r = .229, p < .01$). The remaining variables included traditional architecture ($r = .204, p < .01$), custom designs ($r = .186, p < .05$), rear facing garages ($r = .147, p < .05$), and open floor plan ($r = .178, p < .05$). Almost all the variables were significantly correlated with each other, except for rear facing garages and outdoor living spaces. Since high correlations among independent variables could indicate a possible multicollinearity problem, the variance inflation factor (VIF) for each variable was examined. VIF values were all below the acceptable level of 5, ranging from 1.619 and 2.583, with tolerance levels ranging from .387 and .618. Thus, multicollinearity is not an issue in this model and further analyses were conducted.

Table 15. *Pearson Correlations*

		1	2	3	4	5	6	7	8	9	10
1	Traditional Architecture	1									
2	Outdoor Living Spaces	.195**	1								
3	Street Facing Porches	.410**	.351**	1							
4	Variety of Colors	.586**	.250**	.378**	1						
5	White Picket Fences	.460**	.240**	.361**	.551**	1					
6	Custom Designs	.485*	.483**	.403**	.631**	.419**	1				
7	Rear Facing Garages	.376**	.022	.461**	.573**	.479**	.420**	1			
8	Large Windows	.398**	.436**	.480**	.404**	.439**	.523**	.491**	1		
9	Open Floor Plan	.312**	.510**	.302**	.356**	.353**	.432**	.219**	.630**	1	
10	Sense of Community	.204**	.048	.301**	.229**	-.024	.186*	.147*	.126	.178*	1

*p<.05, **p<.01

Dependent Variable: Sense of Community

Multiple Regression Analysis. Results of the multiple regression analysis of NU architectural design features on SOC are presented in Table 16 on the following page. The overall regression model was statistically significant, $F(9,123) = 3.227, p < .01$. The R^2 value of .191 ($R^2_{adj} = .132$) indicates that the predictors within this model account for about 19% variance in sense of community scores. Of the nine variables within this model, two were found to have a significant positive effect on SOC. These included street facing porches ($\beta = .327, t(132) = 3.166, p < .01$) and open floor plan ($\beta = .178, t(132) = 2.065, p < .05$). White picket fences ($\beta = -.294, t(132) = -2.812, p < .01$) were found to have a significant negative effect on SOC. This indicates that the perceived importance of these physical NU architectural design features have a positive effect on respondents' sense of community, with the exception of white picket fences which has a negative effect. The perceived importance of white picket fences did not show a high correlation with sense of community, which makes sense considering the results indicating a significant negative effect on the overall sense of community.

Table 16. *Results of Multiple Regression Analysis of NU Architectural Design Features and SOC*

Independent Variable	Sense of Community	
	Beta	t
Traditional Architecture	.067	.623
Outdoor Living Spaces	-.154	-1.400
Street Facing Porches	.327**	3.166
Variety of Colors	.211	1.621
White Picket Fences	-.294**	-2.812
Custom Designs	.058	.476
Rear Facing Garages	-.030	-.247
Large Windows	-.091	-.714
Open Floor Plan	.178*	2.065
R^2	.191	
Adjusted R^2	.132	
$F(9,123)$	3.227**	

* $p < .05$, ** $p < .01$

Dependent Variable: Sense of Community

Effects of NU Community Design Features on Sense of Community

Correlations among Variables. In the proposed conceptual model of the study, it was assumed that the perceived importance of NU community design features would have an effect on SOC. Table 17 presents the correlation coefficients among the four NU community design variables: high density, parks & public greens, short house setback, and mixture of housing types, and sense of community.

Table 17. *Pearson Correlations*

	1	2	3	4	5
High Density	1				
Parks & Public Greens	.223**	1			
Short House Setback	.637**	.273**	1		
Mixture of Housing Types	.163*	.166*	.183*	1	
Sense of Community	.269**	.301**	.143	.034	1

* $p < .05$, ** $p < .01$

Dependent Variable: Sense of Community

Correlation coefficients ranged from .034 to .637. Among the NU community design features, high density ($r = .269$, $p < .01$) and parks and public greens ($r = .301$, $p < .01$) indicated significant correlations with SOC. Additionally, all the variables were significantly correlated among themselves. Due to the high correlations among the independent variables, the VIF values for each variable were examined to assess a potential problem of multicollinearity. VIF values ranged from 1.053 and 1.748 with tolerance levels ranging from .572 and .949, eliminating the problem of multicollinearity and allowing for further analysis.

Multiple Regression Analysis. Results of the multiple regression analysis examining the effects of the NU Community design features on SOC are presented in Table 18. Overall, the regression model was found to be significant, $F(4,128) = 5.286$, $p < .01$. Based on the R^2 value of .142 ($R^2_{adj} = .115$), the model indicates that these predictors account for approximately 14% of

the variance in SOC scores. High density ($\beta = -.281$, $t(132) = 2.634$, $p < .01$) and parks and public greens ($\beta = -.273$, $t(132) = 3.178$, $p < .01$) were both found to have a statistically significant effect on SOC; these variables were also the only ones to have a statistically significant correlation with SOC. This indicates that the perceived importance of having high density as well as parks and public greens had a positive effect on residents' sense of community.

Table 18. *Results of Multiple Regression Analysis of NU Community Design Features and SOC*

Independent Variable	Sense of Community	
	Beta	t
High Density	.281**	2.634
Parks & Public Greens	.273**	3.178
Short House Setback	-.104	-.959
Mixture of Housing Types	-.038	-.456
R ²	.142	
Adjusted R ²	.115	
F (4,128)	5.286**	

* $p < .05$, ** $p < .01$

Dependent Variable: Sense of Community

Effects of Walkability on Sense of Community

The conceptual model of this study assumed that walkability would have an effect on sense of community. One-way ANOVA (analysis of variance) was conducted to determine if walking occurrence per week 1) for pleasure/exercise or 2) to go to public places had an effect on residents' sense of community levels. Tables 19 on the following page presents the results of the one-way ANOVA testing.

Since the majority of respondents ($n=127$, 97.7%) walked less than once a week to make a purchase, this variable was dropped from the ANOVA analysis. Additionally, due to the small sub-sample size of walking several times a day to go to public spaces ($n=1$, .7%), this group was excluded from the analysis as well.

Table 19. Results of One-way ANOVA of Walking Occurrence to go to Public Places on SOC

			F	Sig.
Between Groups			7.709	.001**
Post Hoc Tests (Tukey)			Mean Difference	Sig.
Less than Once a Week	Few Times a Week	-.497	.128	.000**
	Once a Day	-.390	.201	.132
Few Times a Week	Less than Once a Week	.497	.128	.000**
	Once a Day	.107	.194	.848
Once a Day	Less than Once a Week	.390	.201	.132
	Few Times a Week	-.107	.194	.848

*p<.05, **p<.01

The results indicate that there is no significant difference in average sense of community levels based on the walking frequency per week for pleasure/exercise. However, the results show that the sense of community of CHV residents varied depending on the walking frequency per week to go to public places, $F(2, 129) = 7.709$, $p < .01$. Tukey's post hoc procedure indicated that those who walked a few times a week ($M = 3.845$, $SD = .542$) had significantly higher SOC levels than those who walked less than once a week ($M = 3.349$, $SD = .770$). This means that residents who walked more frequently per week to go to public spaces tend to have higher levels of sense of community than those who walk less than once a week.

Effects of Respondent Socio-Demographic Features on Sense of Community

The proposed conceptual model of the study assumed that resident socio-demographic characteristics would have an effect on SOC. T-tests were conducted to see if there is a difference in the average SOC levels between those with differences in gender, housing unit type, and presence of children. Since the majority of the sample were married ($n = 122$, 90.4%) and Caucasian ($n = 121$, 93.1%), these variables were dropped from this testing. Additionally, the majority of respondents ($n = 118$, 87.4%) have at least a college degree and more than half have a yearly income of \$100,000 and over ($n = 71$, 52.6%), thus removing level of education and household income as a variable in determining effects of socio-demographic features on sense of

community. Furthermore, the majority of respondents own their homes ($n=129$, 95.6%), with only 5 (3.7%) currently renting, consequently removing this variable from further analyses. The results from the t-tests are represented in Table 20.

Table 20. *Results of Independent Samples T- Test of Socio-Demographic Features on SOC*

					Levene's Test for Equality of Variances		t
Variable		N	Mean	SD	F	Sig.	
Respondent Gender	Male	50	3.735	.701	.733	.393	1.008
	Female	83	3.606	.725			
	Total	133					
Housing Unit Type	Single-family home	115	3.742	.693	.252	.616	3.713**
	Condominium	18	3.098	.622			
	Total	133					
Presence of Children	Yes	93	3.697	.695	.954	.330	1.045
	No	40	3.556	.763			
	Total	133					

* $p<.05$, ** $p<.01$

The results from the t-test indicate that there is no significant difference between the average sense of community levels of males ($n=50$, $M=3.735$, $SD=.701$) and females ($n=83$, $M=3.606$, $SD=.725$). However, the findings did reveal that those who live in single family homes ($n=115$, $M=3.742$, $SD=.693$) have significantly higher sense of community levels than those who live in condominiums ($n=18$, $M=3.098$, $SD=.622$), $t=3.713$, $p<.01$. The presence of children did not seem to have an effect on residents' sense of community.

One-way ANOVA was performed to determine differences in average SOC levels based on respondent age and length of residency as well. Table 21 shows the results of the one-way ANOVA of respondent age on sense of community.

Table 21. *Results of One-way ANOVA of Respondent Age on SOC*

			F	Sig.
Between Groups			2.923	.024*
Post Hoc Tests (Tukey)		Mean Difference	Std. Error	Sig.
20s	30s	.288	.213	.661
	40s	.207	.220	.880
	50s	.852	.269	.016*
	60+	.232	.281	.922
30s	20s	-.288	.213	.661
	40s	-.080	.146	.982
	50s	.565	.213	.068
	60+	-.055	.228	.999
40s	20s	-.207	.220	.880
	30s	.804	.146	.982
	50s	.645	.220	.032*
	60+	.025	.234	1.000
50s	20s	-.852	.269	.016*
	30s	-.565	.213	.068
	40s	-.645	.220	.032*
	60+	-.620	.281	.185
60+	20s	-.232	.281	.922
	30s	.055	.228	.999
	40s	-.025	.234	1.000
	50s	.620	.281	.185

*p<.05, **p<.01

The results from the one-way ANOVA testing indicate that there is no significant difference in average sense of community levels based on length of residency. On the other hand, the results signify that the sense of community of CHV residents varied depending on their age group, $F(38, 89) = 2.923$, $p < .05$. Tukey's post hoc procedure indicated that those in their 20s ($M = 3.953$, $SD = .773$) had significantly higher SOC levels than those in their 50s ($M = 3.056$, $SD = .836$). Additionally, results of the ANOVA point out that those in their 40s ($M = 3.746$, $SD = .693$) seem to exhibit significantly higher levels of SOC than those in their 50s as well.

CHAPTER 5

DISCUSSION AND CONCLUSION

The following chapter presents a discussion on the findings from the survey, as well as the research questions outlined in Chapter 2. Following that, some derived conclusions are discussed, along with theoretical and practical implications of the study. Lastly, study limitations and suggestions for future research are provided in the final section.

Discussion

This section provides a discussion of the findings from the survey on the effect of New Urbanist architectural and community design features, as well as walkability and respondent socio-demographic characteristics on sense of community. Based on the theoretical backgrounds of New Urbanism and sense of community, combined with previous empirical studies, the basic conceptual model of this study assumed that New Urbanist architectural and community design features along with walkability and resident socio-demographic characteristics will be related to SOC. Supported by the descriptive statistics, regression analyses, ANOVA and t-tests obtained from the survey results, major findings about the features influencing sense of community in residents of a NU neighborhood, alongside the study's research questions, are summarized as follows:

RQ 1. How do New Urbanist architectural design features, if any, influence sense of community in residents of a New Urbanist neighborhood?

The New Urbanist architectural design features explored in this study included 1) traditional architecture, 2) outdoor living space 3) street facing porches, 4) variety of colors, 5)

white picket fences, 6) custom design, 7) rear facing garages, 8) large windows, and 9) open floor plan. Survey respondents generally considered all the NU architectural design variables to be important in the promotion of their sense of community. However, among the nine NU architectural design features examined in this study, two were found to have a significant positive effect on the sense of community in residents of CHV: facing porches and an open floor plan. The results show that these variables are likely to have a positive effect on residents' sense of community. Meanwhile, white picket fences were found to have a significant negative effect on the sense of community in residents of CHV, indicating that this variable is likely to have a negative effect on residents' sense of community.

Duany and Plater-Zyberk (1992) claimed that the presence of street facing porches not only creates more walking traffic by projecting the human presence within the home to pedestrians, but acts as a bridging element between public and private spaces. This study's findings support previous studies which have indicated that street facing porches have been found to encourage conversations between residents and pedestrians, resulting in higher levels of social interactions, and consequently fostering a higher sense of community (Brown, Burton, & Sweaney, 1998; Brown & Cropper, 2001).

The significance of having an open floor plan in the promotion of CHV residents' sense of community was an interesting outcome of the study's results. Previous studies have shown that a floor plan which maximizes space, as in an open floor plan concept, can help regulate social interactions by reducing crowding (Evans, 1996). Therefore, it makes sense that having an open floor plan would positively enhance sense of community by increasing social interactions. The availability of an open floor plan can allow for more entertaining and gathering possibilities, thus fostering more social connections.

Since CHV was developed under TND principles, the inclusion of white picket fences was used with the intention of enhancing the landscaping of sidewalks and walkways within the neighborhood. In a qualitative study of residents of Seaside, FL, researchers revealed that certain architectural design features, including fences, were associated with feelings of friendliness, neighborliness, and belonging (Plas & Lewis, 1996). However, the inclusion of white picket fences does not allow for any personalization of the home, which has been found to enhance place identity and neighborliness (Werner, Peterson-Lewis, & Brown, 1989). Furthermore, design elements such as white picket fences have been criticized of being “artificial” by creating a superficial sense of community and culture through an imitation of traditional architectural styles (Landecker, 1996; Southworth, 1997). This study supports those previous findings.

RQ 2. How do New Urbanist community design features, if any, influence sense of community in residents of a New Urbanist neighborhood?

Four variables were studied for the New Urbanist community design features, including 1) high density, 2) parks and public greens, 3) short house setback, and 4) mixture of housing types. The results indicate that the perceived importance of parks and public greens (rated as the most important among all 4 variables), as well as the perceived importance of high density, has a significant effect on respondents’ sense of community. This indicates that the availability of parks and public greens for people to visit seems to enhance their sense of community. Additionally, the spatial arrangement of houses, being much closer in New Urbanist developments, thanks to the narrower house foot print, improved the overall sense of community as well. These findings mirror those of another study exploring residents’ attachment to New Urbanist versus conventional suburban developments, in which the physical features perceived as most important in the New Urbanist neighborhood included “arrangement of houses in

relation to others” (i.e. high density) and “parks and playgrounds” within the top three variables (Hashas, 2004).

The perceived importance of parks and public greens and its subsequent effect on sense of community was not a surprising outcome since a major principle of New Urbanism promotes the distribution of a wide range of parks and public greens within a neighborhood. Duany and Plater-Zyberk (1992) theorize that the addition of public spaces, including parks and public greens, creates a sense of place. Public spaces serving to create a sense of place theoretically encourage the perception of community (Talen, 1999). Previous empirical studies have indicated that parks and public greens may provide an opportunity for occasional encounters, which ultimately work to strengthen community bonds (Langdon, 1994).

As for high density, which refers to the spatial arrangement of houses to each other, New Urbanist theory claims that compact, high-density design helps to increase the potential chance of casual social encounters, encouraging a higher sense of community. This is in stark contrast to typical suburban developments which confine people to their own private areas due to a low density spatial relationship, thus theoretically creating a sense of isolation from the community (Duany & Plater-Zyberk, 1992; Katz, 1994). Although some previous studies argue that there is no need for high-density compact design because low-density is a preference for residential living, this study’s findings support the New Urbanist theory of compact design instead (Gordon & Richardson, 1997).

One interesting outcome of these findings is that having a mixture of housings types did not have a significant effect on sense of community and was actually perceived to be the least important of community design variables. The theory of New Urbanism states that a variety of housing types and price levels can bring a diverse set of people together, increasing daily

interactions and consequently strengthening their community bonds. Thus, it was assumed that having a mixture of housing types would have had a positive effect on sense of community. However, Talen (1999) found that sense of community may actually be a result of homogeneity, therefore making it difficult to achieve both diversity and sense of community simultaneously. Additionally, in a study exploring the influence of New Urbanist design traits on residential satisfaction, social mix was found to have a negative correlation with residential satisfaction. This study's findings seem to support that notion.

RQ3. How, if any, influence does walkability have on sense of community in residents of a New Urbanist neighborhood?

Walkability in this study was measured by whether respondents felt that they needed a vehicle to get around the neighborhood as well as by the walking occurrence frequency per week to either 1) to go to public places, 2) to make a purchase, and 3) for pleasure/exercise. The findings indicate that the majority of respondents did not their car to get around the neighborhood. Overall, walking for pleasure/exercise was done most frequently by respondents. However, the vast majority of respondents indicated that they walked less than once a week to make a purchase. Despite that, over half of the respondents walked a few times a week to go to public spaces. The results showed that those who walked to go to public places a few times a week had significantly higher sense of community levels than those who only walked less than once a week.

There have been several previous empirical studies conducted that test the New Urbanist claim that distinct physical features can lessen vehicle dependence in residents of New Urbanist neighborhoods (Joh et al., 2008; Khattak & Evenson, 2005; Khattak et al., 2005; Krizek, 2003; Nasar, 2003). Mainly employing a comparative methodology to explore the difference in vehicle

dependency in New Urbanist neighborhoods versus conventional suburban developments, these studies supported the New Urbanist theory since residents of New Urbanist neighborhoods were found to make significantly less automobile trips and travel less miles compared to their suburban counterparts. Although this study did not use a comparative methodology, the findings indicate that the vast majority of respondents did not use their vehicle to get around the neighborhood and support the findings of these previous empirical studies.

Walking a few times a week to go to public places leading to higher sense of community compared to walking less than once a week was an expected result, as previous studies have indicated that different physical features of the built environment, including the use of shopping facilities and neighborhood facilities such as retail, entertainment, and religious institutions have a positive effect on social interactions (Riger, LeBailly, & Gordan, 1981; Ahlbrandt, 1984). Levine (1986) also found that social interactions increased the more an individual made use of public space, and this study's findings support that claim. The inclusion of a performing arts theater, restaurants and civic institutions within the design of CHV seems to have positively impacted the frequency of walking to go to public places and ultimately effecting respondents' sense of community.

On the other hand, the study did also indicate that the majority of respondents walked less than once a week to make a purchase. Although CHV aimed in its conceptual design to create a lively town center surrounded with different shopping and dining options to meet residents' daily needs, the actual outcome is different. Due to the financial downturn in the State of Michigan and the resulting recession of the economy, the construction of several retail components in the CHV plan were not executed (Erkul, 2009). This consequently led to an absence of retail stores, making it difficult for residents to walk more frequently to make a purchase.

RQ 4. How do socio-demographic features, if any, influence sense of community in residents of a New Urbanist neighborhood?

The influence of socio-demographic characteristics within this study included the examination of 1) respondent gender, 2) respondent age, 3) marital status, 4) level of education, 5) household income, 6) race, 7) housing unit type, 8) housing tenure, 9) length of residency and 10) number of children. The study showed that the majority of respondents owned their homes as opposed to renting, were married, Caucasian, possessing at least a college degree and had a yearly household income of \$100,000 and over. Additionally, it was found that there was no difference in average sense of community levels between males and females. Length of residency and the presence of children did not seem to have a significant effect on sense of community levels either. On the other hand, the results indicate that respondents in their 20s displayed a significantly higher sense of community level compared to those in their 50s. Moreover, the results also suggest that those in their 40s had significantly higher sense of community levels compared to those in their 50s as well. Additionally, the findings revealed that those who live in condominiums had significantly lower sense of community levels than those who lived in single-family homes.

New Urbanism theory claims that socio-economically homogenous developments, typical of suburban neighborhoods, have a negative effect on sense of community since rich social relations are theoretically derived from social diversity (Anderson, 2000; Duany & Plater-Zyberk, 1992; Kelbaugh, 1989). Therefore, New Urbanist neighborhoods should employ a wide range of housing types at different price points to accommodate people of diverse ages, races, and incomes into daily interaction. However, this study's findings indicate that although the intent of CHV was to promote this diversity, the actual outcome is different. It seems that the

demographics most represented in CHV were married, Caucasian, college educated individuals with a yearly household income more than double the state average of \$45,254 (U.S. Census Bureau, 2009). These findings support previous empirical studies which claim that income diversity is not advanced by New Urbanist projects (Marshall, 2004). Lehrer and Milgrom (1996) argued that the New Urbanist physical design model presents a bias towards a specific consumer market. Additionally, despite the New Urbanist claim that its physical developments are to be credited for high levels of sense of community, Grant (2006) found that residents' unity is more based on homogeneity and self-selection. This study found that residents living in single-family homes displayed much higher sense of community levels than those in condominiums. Based on previous studies, this could be due to the income level difference between those living in condominiums and those living in single-family homes.

In addition to housing type, the present study's findings also indicated a significant effect on sense of community based on age. However, parenthood status, gender and length of residency did not show a significant effect on sense of community as opposed to the results of previous empirical studies. Campbell and Lee's (1992) study of sense of community and neighborhood networks explored several socio-demographic variables including but not limited to age, parenthood status, and gender. The results of their study concluded that residents with higher "familistic statuses", such as with children, tend to have a higher level of sense of community than their childless counterparts. Furthermore, the study found that women tend to have larger neighborhood networks than men. This study did not support those findings. Riger and Lavrakas (1981) study indicated that length of residency could be an indicator for "physical rootedness", or the level of settlement a person has in his/her community, thus assuming the

longer the length of residency the higher the level of sense of community. Despite that, this study's results did not find any significant effect of length of residency on sense of community. On the other hand though, Campbell and Lee's (1992) study did indicate that age could have an effect on sense of community, claiming that aging seems to be associated with a lower level of attachment and consequently less social interactions. Since this study found that respondents in their 20s and 40s displayed a significantly higher sense of community level than respondents in their 50s, the results support those previous findings.

Conclusion

The analysis of the survey questionnaire allowed the derivation of several conclusions in regards to each of the study's 4 research objectives.

The first objective was to identify how New Urbanist architectural design features influence sense of community in residents of a New Urbanist neighborhood. The study concluded that while generally all the New Urbanist architectural design features were perceived to be important in the promotion of residents' sense of community, the perceived importance of street facing porches and an open floor plan are most likely to have a significant positive effect on residents' sense of community, while the perceived importance of white picket fences are most likely to have a significant negative effect on residents' sense of community.

The second objective of the study was to explore how New Urbanist community design features influence sense of community in residents of a New Urbanist neighborhood. The study concludes that the perceived importance of parks and public greens and the perceived importance of high density both have a significant positive effect on residents' sense of community.

Additionally, having a mixture of housing types was perceived to be the least important feature in influencing the sense of community in residents of CHV.

Third, the influence of walkability on sense of community in residents of a New Urbanist neighborhood was explored. The study concluded that the increase of walkability to go to public places had a significant positive influence on residents' sense of community. Additionally, the lack of walkability to make a purchase was evident due to the absence of retail shops within the neighborhood.

Lastly, the study aimed to explore how socio-demographic features influence sense of community in residents of a New Urbanist neighborhood. The study has several significant results on the effect of socio-demographic features on sense of community. Findings indicate that age and housing type had a significant positive influence on sense of community. It was also concluded that the overall sense of community of CHV residents could be due to lack of diversity, confirming previous studies that indicated sense of community could actually be a result of homogeneity rather than diversity (Talen, 1999).

Implications

Several theoretical as well as practical implications can be gained from the results of the present study. The following will review some suggestions for researchers and practitioners alike.

Theoretical Implications

Several theoretical implications are derived as a result of this study. Sense of community has been the research interest of various community psychologists and urban researchers (Buckner, 1988; Chavis et al., 1986; Davidson & Cotter, 1986; Glynn, 1981; Nasar & Julian,

1995; Skjaeveland, Garling, & Maeland, 1996). Skjaeveland, Garling, and Maeland's (1996) 14-item MMN was utilized within this study to measure sense of community. As opposed to the four dimensions presented by the MMN, only three factors underlying the measures were identified in this study.

Additionally, there are several studies that explored the influence of physical features on travel behavior and other New Urbanist social goals in various states other than Michigan (Joh et al., 2008; Khattak & Evenson, 2005; Khattak et al., 2005; Krizek, 2003; Nasar, 2003). The rise of New Urbanism in the State of Michigan is apparent through the emergence of several programs and new developments employing traditional neighborhood design (Kim, Lee, & Bell, 2008). And the present study's findings add to the body of knowledge concerning New Urbanist developments in this state to further improve housing policy and design.

Furthermore, this study's findings contribute to New Urbanist research by employing not only exterior but interior design elements as well. The perceived importance of an open floor plan was found to have a significant effect on sense of community. Floor plan layout and its effect on social interaction patterns has been studied previously but not in the New Urbanist context (Evans, 1996). The perceived importance of physical design features was also supported by this study. However, this study also recognized the effect of socio-demographic features on sense of community as well.

Practical Implications

The increasing popularity of New Urbanist design in the State of Michigan requires more studies exploring the actual effects of New Urbanist physical design features on sense of community. Designers, architects, planners and housing policy makers need to understand the actual outcomes of New Urbanist physical design features in order to create more socially viable

communities. The results of the present study identified several important design features in positively influencing sense of community which can be utilized as potential design guidelines for future residential developments. Based on the outcome of the survey questionnaire, several suggestions can be provided for future design considerations.

The findings of this study indicate that the perceived importance of having street facing porches positively influences residents' sense of community. The inclusion of street facing porches within the home can thus enhance social interactions, therefore encouraging designers to place emphasis on this area of the home. Additionally, in the State of Michigan, street facing porches may not be utilized year round due to the harsh winter climates. This could be another practical consideration for designers when considering the inclusion of a street facing porch. Making sure that the street facing porch is well lit and comfortably designed will encourage residents to utilize it more.

This study also found that the perceived importance of white picket fences had a negative effect on residents' sense of community. Therefore, designers and architects should take into consideration traditional architectural elements such as a white picket fence as a way of enhancing feelings of nostalgia and neighborliness while still finding a way to personalize the home. Considering different styles of white picket fences can maintain that traditional look while still avoiding a cookie cutter appearance. Additionally, different styles and colors of fences should be applied.

An important practical implication of this study is targeted towards interior designers. Designers are encouraged to consider creating residences with an open floor plan concept, as this study revealed that residents' sense of community was positively influenced by having an open

floor plan. By opening up the kitchen area to the living room, designers can encourage social gatherings and entertaining which can ultimately lead to higher levels of social interactions.

Additionally, the perceived importance of parks and public greens had a positive influence on residents' sense of community. Therefore, designers, architects, and planners are encouraged to develop parks within the neighborhood to increase social interactions. This study suggests locating several parks and public greens within walking distance to facilitate use of these spaces.

Another design feature that was identified as being significant in positively influencing the sense of community in residents of CHV was having a high number of households within a small area, or high density. Due to this finding, this study suggests that designers and architects consider building vertically as opposed to horizontally. The narrower foot print may sometimes result in smaller rooms, and therefore designers are urged to consider space maximizing interior design features, such as high ceilings and specific color considerations, to avoid the perception of crowding. Maintaining an open floor plan concept as previously discussed can also help accommodate the narrow footprint of the house.

The walkability of the neighborhood cannot be overlooked. The study found that the majority of respondents walked less than once a week to make a purchase. In order to facilitate this activity, community designers are suggested to include more retail stores within the neighborhood to accommodate residents' daily needs. On the other hand, the results showed that over half of the respondents walked a few times a week to go to public spaces (including but not limited to restaurants, theaters, and salons). Therefore, it is suggested that community designers include a variety of public spaces within walking distance in the neighborhood to encourage sense of community.

Study Limitations

Although this study contributed to the body of knowledge of New Urbanist research, there are several limitations.

Limited Generalization of Findings

Since only one New Urbanist neighborhood was selected for this survey, careful consideration should be given when applying the conclusions of this study to the general population. Additionally, the survey respondents demonstrated a narrow demographic profile. The majority of the residents in CHV were married, Caucasian, college educated with high yearly household incomes. Other marital statuses, races, education and income levels are underrepresented in this population. Therefore, this sample may not be representative of general New Urbanist residents.

Low Construct Validity of Some Variables

Although most of the variables and measures were derived from previous studies, the construct validity of some of the variables in this study was relatively low. Although these variables, specifically regarding the interior design features, were derived from previous empirical studies, they have not been measured in the quantitative manner as was conducted within this study. Therefore, there is a limitation in the use of these variables.

Limitation in Questionnaire Interpretation

Although every attempt was made to make the survey understood in one way, different interpretations may affect the findings of this study. The present study relied on self-reported data, which may lead to some biases in responses and is therefore considered a limitation of the study.

Despite these limitations, it is hoped that this study will provide some insight on the actuality of New Urbanist design in the State of Michigan. The following section presents suggestions for future studies.

Future Research

Since the amount of studies conducted in the State of Michigan regarding New Urbanist design are limited despite the escalating popularity of this design model, several suggestions for future research are made in this section.

First, another approach that can be taken in immediate future research involves the further analysis of the influence of design features on sense of community by expanding Skjaeveland, Garling, and Maeland's (1996) 14-item MMN. Since this study measured sense of community using a summated scale by assembling items from the three rationally derived factors of the MMN, further exploration into the effect of the variables to each separate factor could be worthwhile. Additionally, this study employed a quantitative data collection method. The inclusion of qualitative methods such as interviews with residents may reveal more significant and meaningful findings.

Second, the context of this study could be expanded for future studies. A comparative study methodology with other New Urbanist developments in Michigan could be useful. Additionally, this study could be extended to other areas in the United States to strengthen the external validity of the study.

Third, although walkability was measured in this study by walking occurrence and vehicle dependency within the neighborhood, future studies can include the effect of specific

physical design features in enhancing walkability. Additionally, vehicle dependency outside of the neighborhood could be included as another variable.

Fourth, an interesting outcome of the study was the identification of an interior design element as having a significant effect on sense of community. The inclusion of other interior design elements in further studies within the New Urbanist context would be worth studying. In addition to physical interior design elements, issues of crowding and its effect on sense of community could be explored.

Lastly, New Urbanism presents several social goals not limited to sense of community. Therefore, it would be desirable to explore the effects of the New Urbanist physical design model on other social phenomena such as residential attachment. These investigations could lead to a more significant understanding of the effect New Urbanist physical design features have on the perceptions of residents, thereby allowing designers to implement guidelines which enhance the quality of life within a community.

APPENDICES

APPENDIX A: IRB APPROVAL DOCUMENT

**MICHIGAN STATE
UNIVERSITY**

Initial IRB Application Determination ***Exempt***

April 1, 2011

To: Eunsil Lee
203B Human Ecology
Michigan State University
East Lansing, MI 48824
Re: **IRB# x11-292** Category: Exempt 1-2
Approval Date: April 1, 2011

Title: EXPLORING SENSE OF COMMUNITY IN NEW URBANIST NEIGHBORHOODS: A
CASE STUDY OF CHERRY HILL VILLAGE IN CANTON, MICHIGAN

The Institutional Review Board has completed their review of your project. I am pleased to advise you that **your project has been deemed as exempt** in accordance with federal regulations.

The IRB has found that your research project meets the criteria for exempt status and the criteria for the protection of human subjects in exempt research. **Under our exempt policy the Principal Investigator assumes the responsibilities for the protection of human subjects** in this project as outlined in the assurance letter and exempt educational material. The IRB office has received your signed assurance for exempt research. A copy of this signed agreement is appended for your information and records.

Renewals: Exempt protocols do not need to be renewed. If the project is completed, please submit an *Application for Permanent Closure*.

Revisions: Exempt protocols do not require revisions. However, if changes are made to a protocol that may no longer meet the exempt criteria, a new initial application will be required.

Problems: If issues should arise during the conduct of the research, such as unanticipated problems, adverse events, or any problem that may increase the risk to the human subjects and change the category of review, notify the IRB office promptly. Any complaints from participants regarding the risk and benefits of the project must be reported to the IRB.

Follow-up: If your exempt project is not completed and closed after three years, the IRB office will contact you regarding the status of the project and to verify that no changes have occurred that may affect exempt status.

Please use the IRB number listed above on any forms submitted which relate to this project, or on any correspondence with the IRB office.

Good luck in your research. If we can be of further assistance, please contact us at 517-355-2180 or via email at IRB@msu.edu. Thank you for your cooperation.

Sincerely,



Harry McGee, MPH
SIRB Chair

APPENDIX B: SURVEY INSTRUMENT

How do you feel about living in Cherry Hill Village?

Welcome!

Dear Cherry Hill Village Resident,

We want to know your opinion regarding “sense of community” in your neighborhood, the feeling that you belong to your community. You are being asked to participate in a survey as part of a Master’s Thesis research conducted by Shahad Alzaidan at the School of Planning, Design, and Construction at Michigan State University. Cherry Hill Village claims to be a Traditional Neighborhood Development but little is known about the quality of social life of the community. By participating in this survey, you will be providing essential feedback to the improvement of neighborhood design and planning in general and quality of living in your neighborhood in particular.

Your participation in this survey is very important. This survey will take approximately 15 minutes to complete. Please note you must be 18 years or older to participate.

Thank you in advance for taking the time to complete this survey!

Sincerely,

Shahad Alzaidan
Master Candidate
School of Planning, Design and Construction
201L Human Ecology
Michigan State University
East Lansing, MI 48824

How do you feel about living in Cherry Hill Village?



This study is intended for research purposes only. Your responses will not be associated with you in any way and will remain strictly confidential. Your identity will not be linked to the data you provide. All data collected will be stored in a secure location, being accessed only by the researcher. There are no anticipated risks associated with participation. You consent to voluntarily participate in this study by completing this survey. Findings will be published in the Master's Thesis and may be published or presented at professional meetings, but the identities of all research participants will remain anonymous.

How do you feel about living in Cherry Hill Village?

Your Neighbors

These questions refer to your neighbors in Cherry Hill Village.

1. How many neighbors do you visit now and then?

- ☐ None
- ☐ 1-2 neighbors
- ☐ 3-5 neighbors
- ☐ 6 and over neighbors

2. How many of your closest neighbors do you typically stop and chat with when you run into them?

- ☐ None
- ☐ 1-2 neighbors
- ☐ 3-5 neighbors
- ☐ 6 and over neighbors

3. How many of your neighbors who live near you do you say hello to when you meet them?

- ☐ None
- ☐ 1-2 neighbors
- ☐ 3-5 neighbors
- ☐ 6 and over neighbors

How do you feel about living in Cherry Hill Village?

2. Please check only one answer for each item based on “1 = Strongly Disagree” through “5 = Strongly Agree”.

	1 Strongly Disagree	2 Disagree	3 Neither Agree Nor Disagree	4 Agree	5 Strongly Agree
If I need a little company, I can stop by a neighbor I know.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I have a personal crisis, I have a neighbor I can talk to.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have made new friends by living here.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
If I don't have something I need for my cooking, I can borrow it from a neighbor.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel strongly attached to this residence.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I never feel quite safe in my current house.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Noise, which my neighbors make, can occasionally be a big problem.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I don't feel at home in this neighborhood.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I would have better contacts with friends, family, etc., if I lived in another part of town.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How do you feel about living in Cherry Hill Village?

Walking in Cherry Hill Village

These questions refer to your own neighborhood. Please answer all questions in this part.

1. Do you need a car to get around in this neighborhood?

- ☐ No
☐ Yes

2. How often do you typically walk in Cherry Hill Village?

	Less than Once a Week	Few times a Week	Daily	Several times a Day
For pleasure/exercise	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To make a purchase	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
To go to public places (parks, squares, clubhouse etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How do you feel about living in Cherry Hill Village?

Physical Features of Cherry Hill Village

These questions refer to your own neighborhood. Please rate the level of importance for each item based on "1 = Not Important" through "5 = Extremely Important".

1. How important to you are these physical features in promoting your sense of community within Cherry Hill Village?

	1 Not Important	2 Somewhat Important	3 Important	4 Very Important	5 Extremely Important
Having a high number of households in a small area	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parks and public greens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Short distance between your house and the sidewalk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Traditional architectural style of houses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mixture of housing types, such as single family homes and condominiums	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Houses designed with high-end finishes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inclusion of outdoor living spaces, such as a deck or large backyard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Street facing porches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pitched roofs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Variety of home colors in the neighborhood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
White picket fences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Custom designed homes, not cookie-cutter style	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rear facing garages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Large windows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How do you feel about living in Cherry Hill Village?

Open floorplan: kitchen open to
the living room

How do you feel about living in Cherry Hill Village?

Living in Cherry Hill Village

These questions refer to your own neighborhood. Please answer all questions in this part.

1. Please rate your satisfaction regarding the following questions based on "1= Very Dissatisfied" through "5= Very Satisfied".

	1 Very Dissatisfied	2 Dissatisfied	3 Somewhat Dissatisfied	4 Satisfied	5 Very Satisfied
In general, how satisfied or dissatisfied are you with your current home?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
In general, how satisfied or dissatisfied are you with your current neighborhood?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. Please rate your level of agreement or disagreement regarding the following statements based on "1= Strongly Disagree" through "5= Strongly Agree".

	1 Strongly Disagree	2 Somewhat Disagree	3 Neither Agree Nor Disagree	4 Somewhat Agree	5 Strongly Agree
If I move again, I'd like to live in my current home	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel the house I am currently living in is really 'my home'	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel my current neighborhood is really "my neighborhood"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How do you feel about living in Cherry Hill Village?

3. Please rate your quality of life in your current home based on "1= Excellent" through "5= Poor"

	1 Excellent	2 Good	3 Satisfactory	4 Fair	5 Poor
Overall my physical well-being is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall my mental/emotional state is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall my ability to handle stress is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall my enjoyment of life is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Overall my quality of life is	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How do you feel about living in Cherry Hill Village?

Living in Cherry Hil Village

Please answer all questions in this part.

1. Do you rent or own your place of residence?

- ☐ Own
☐ Rent
☐ Other (please specify)

2. How long have you been living in this neighborhood?

Years

Months

3. How long do you expect to live in this neighborhood?

Years

Months

4. What type of housing unit do you live in?

- ☐ Single-family home
☐ Condominium
Other (please specify)

5. How many bedrooms are there in your home?

Bedrooms

6. How many persons are there in your household including you?

Persons

How do you feel about living in Cherry Hill Village?

Satisfaction with Cherry Hill Village

These questions refer to your own neighborhood. Please rate your satisfaction regarding the following question based on "1= Very Dissatisfied" through "5= Very Satisfied".

1. How satisfied are you with the following physical features in Cherry Hill Village?

	1 Very Dissatisfied	2 Dissatisfied	3 Somewhat Dissatisfied	4 Satisfied	5 Very Satisfied
Having a high number of households in a small area	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Parks and public greens	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Short distance between your house and the sidewalk	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Traditional architectural style of houses	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Mixture of housing types, such as single family homes and condominiums	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Houses designed with high-end finishes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inclusion of outdoor living spaces, such as a deck or large backyard	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Street facing porches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Pitched roofs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Variety of home colors in the neighborhood	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
White picket fences	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Custom designed homes, not cookie-cutter style	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rear facing garages	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Large windows	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

How do you feel about living in Cherry Hill Village?

Open floorplan: kitchen open to
the living room

How do you feel about living in Cherry Hill Village?

About You

Please answer all questions in this part.

1. Your gender:

- ☐ Male
☐ Female

2. What is your age?

Years

3. What is your marital status?

- ☐ Never married
☐ Married
☐ Divorced
☐ Separated
☐ Widowed

Other (please specify)

4. Please write the number of children living with you in your current home. (If none, write "0")

Children

5. Are you presently:

- ☐ Employed
☐ Unemployed
☐ Retired
☐ Full-time homemaker

Other (please specify)

How do you feel about living in Cherry Hill Village?

6. Where is the location of your work place? (If retired, describe the location of the occupation before retirement.)

- ☐ Within Cherry Hill Village
- ☐ Canton and its vicinities
- ☐ Other city in Michigan
- ☐ Other state
- ☐ Other country
- ☐ Not Applicable

7. What is the highest level of education you have completed?

- ☐ No formal education
- ☐ Completed grade school
- ☐ Completed high school
- ☐ Completed college
- ☐ A graduate degree

Other (please specify)

8. What was your approximate household income before tax from all sources, in 2010?

- ☐ Less than \$20,000
- ☐ \$20,000 to \$39,999
- ☐ \$40,000 to \$59,999
- ☐ \$60,000 to \$79,999
- ☐ \$80,000 to \$99,999
- ☐ \$100,000 and over
- ☐ Prefer not to answer

How do you feel about living in Cherry Hill Village?

9. What is your race?

- ☐ Caucasian
- ☐ African-American
- ☐ Asian
- ☐ Native Hawaiian or other Pacific Islander
- ☐ American Indian or Alaska Native
- ☐ Prefer not to answer

Other (please specify)

How do you feel about living in Cherry Hill Village?

Your Opinion

1. In your opinion, what are the positive aspects of living in Cherry Hill Village? (Answer not required)

2. In your opinion, what are the negative aspects of living in Cherry Hill Village? (Answer not required)

3. Please make any additional comments regarding any related issues that you have been asked in this questionnaire. (Answer not required)

Thank you for completing this survey!

Please direct any questions about this study to Shahad Alzaidan at alzaidan@msu.edu, phone (616) 635-9292. If you have any questions or concerns regarding your rights as a study participant, or are dissatisfied with any aspect of this study, you may contact – anonymously, if you wish: Eunsil Lee, Ph.D., Michigan State University's Assistant Professor at the School of Planning, Design, and Construction at Michigan State University by phone: (517) 432-3249, e-mail: leeunsil@msu.edu, or regular mail: 201L Human Ecology, East Lansing, MI 48824.

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