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The Role of the Landscape in the Socialization of Cohousing Communities: A Study in Western Massachusetts

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The role of the landscape in the socialization of cohousing communities:
A study in Western Massachusetts

A Thesis Presented

by

EMILIE MARQUES JORDAO

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The role of the landscape in the socialization of cohousing communities:
A study in rural Western Massachusetts

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DEDICATION

To my caring and supportive parents, Elizabeth and Marco, who have always provided unconditional love and encouragement in all areas of my life.

To my sisters, Stefanie and Beatrice, who continue to be my safe-harbor, best friends and with whom I share my biggest achievements and defeats.

To my loving partner, Brendan, whose ability to inspire and encourage my steps through life continues to awe me each and every day.

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I would like to express my deepest gratitude to everyone who have helped me through the process of conceptualizing, gathering information and writing this thesis. I am thankful for their guidance, constructive feedback and advice during this long process.

I express my warm thanks to Carey Clouse, who has encouraged me from the beginning and helped me explore the full potential of my project. To Mark Hamin, who has been one of the most important mentors from day one of my Master's degree, and has brought an important planning perspective to the project. I would also like to thank Aviva Galaski, whose incredible practical knowledge and willingness to join my committee ensured a compelling thesis work.

Also, this project would not have been possible without visiting cohousing communities across the Pioneer Valley of Western Massachusetts. For kindly welcoming me, guiding me through and providing information about their communities, I thank David Entin, Bruce Coldham, Richart Keller, Kevin Moore, Laura Fitch and John Porcino. Important exchanges with Angela Sanguinetti have added meaning and depth to this project, and for that I will always be thankful.

The cohousing community, both in practice and in research, has been incredibly welcoming and supportive of my project. This spirit of camaraderie reiterates my beliefs on the importance of collaboration, both in the sciences and in design, in order to achieve results that best benefit those around us.

Thank you.

ABSTRACT

THE ROLE OF THE LANDSCAPE IN THE SOCIALIZATION OF COHOUSING COMMUNITIES: A STUDY IN WESTERN MASSACHUSETTS

MAY 2016

EMILIE MARQUES JORDAO, B.S., CENTRAL MICHIGAN UNIVERSITY

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Directed by: Professor Carey Clouse

The cohousing movement started in the United States in the 1990's and since then has spread to over 160 communities throughout the country. This type of community is characterized by small dwelling units, high housing density, shared facilities such as a common house, shared commons and grouped parking. These are pedestrian-oriented communities with car circulation restricted to the outskirts of the neighborhood. Cohousing settlements have the goal of promoting social interaction and sustainable living through design, programming, and shared ideals. Many design characteristics, such as house proximity, density, building height and size, the location of parking, the availability of common spaces, and size of private spaces influence social interaction in the community. However, design is not solely responsible for promoting socialization. Other variables such as programming and personal ideologies also need to be taken into consideration when analyzing social interaction within cohousing communities. With regard to sustainability, cohousing is a valid option compared to traditional housing types because it encourages resource sharing, promotes a mixed-use and mixed-income environment, and strengthens social networks. Cohousing communities can thrive in a variety of shapes, sizes and settings, and have varying degrees of outdoor spaces and

availability. This study considers how outdoor spaces affect socialization behavior among residents in cohousing and aims to provide recommendations for shaping outdoor spaces in such settings. Methods include a literature review, an analysis of case studies, spatial analysis, on-site observations, informal conversations and referencing previously conducted surveys.

Key words: cohousing, community, social interaction, outdoor spaces, landscape.

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CHAPTER 1

INTRODUCTION

A cohousing community is typically composed of private houses as well as shared outdoor spaces and facilities. These communities are designed to foster social interactions between residents and are often maintained and managed by residents as well (Marcus, 2000). In contrast to typical American suburban neighborhoods, cohousing communities have “low-rise attached housing clustered on the site, a centrally located separate common house, and parking at the periphery of the site” (Marcus, 2000). Scholars such as Adams (1992) debunked the “happy suburbanite” concept wherein people in suburbs felt happier because of lower population density, crime and higher population stabilization. Cohousing communities offer an alternative to low-density neighborhoods with a lack of social interaction, by enhancing social networks.

The cohousing movement started in northern Europe in the 1970’s, and was brought to the U.S. in the 1990’s (Fromm, 2000; Williams, 2008). In both parts of the world, cohousing started as a grass-roots initiative, but while it developed in both social and private sectors in Europe, it was limited to the private sector in the U.S. (Williams, 2008). In northern Europe, governments have recognized the social and environmental advantages of cohousing communities, so top-down approaches are usually observed in the development of this type of housing (Williams, 2008). In the U.S., the cohousing movement is still largely a resident-led process and, thus highly dependent upon public demand (Williams, 2008). When developing a

cohousing community, residents invest considerable time, financial and management responsibilities (Williams, 2008).

In his book *Senior Cohousing*, Charles Durrett (2009) lists six components of cohousing: 1) participatory process; 2) deliberate neighborhood design; 3) extensive common facilities; 4) complete resident management; 5) non-hierarchical structure and 6) separate income sources. Forming groups are typically composed of individuals and families interested in establishing a new cohousing community for themselves. They are involved in all stages of establishing cohousing, including the design process, permitting and acquiring construction funds (ibid). Therefore, future residents interact and collaborate long before the cohousing is built, which indicates that community starts forming in the first stages of planning cohousing (ibid). As described above, the design of a cohousing neighborhood is planned to maximize community interaction and collaboration. Shared facilities, such as common houses, gardens and parking play a major role in sustaining community interactions. Many different planned and unplanned activities occur in shared areas, and usually the residents are responsible for maintaining these spaces as a group.

Another important component of cohousing living is the non-hierarchical structure for decision-making (ibid). Residents in cohousing usually take up tasks related to their interests, time availability and knowledge. Decisions are made collectively and tasks are shared amongst members, so no one person is completely in charge of practices impacting the whole community (ibid). Finally, residents in cohousing usually maintain separate income sources. In comparison to a commune structure, in cohousing there is no “shared income, no shared religious or political

beliefs, and homes are privately owned” (Chapin, 2011). According to Durrett (2009), tethering a primary income source to the community as a whole can change neighbor dynamics and fundamentally is beyond the scope of cohousing.

According to the Cohousing Association of the United States’ map, edited by Godwin (2015), there are 161 established communities, with 135 completed and 26 in the construction phase. An additional 22 projects have secured building sites and 99 are in the initial stages of group formation and planning (Figures 1 and 2). As demonstrated by the map, there are many cohousing communities clustered along the east and west coasts of the U.S. and most of them are located near large cities or near university towns (Margolis & Entin, 2011). According to the 2011 National Survey of Cohousing Residents, cohousing communities “reported their location as suburban or small town (44%), urban (39%) and rural (17%)” (Margolis & Entin, 2011).

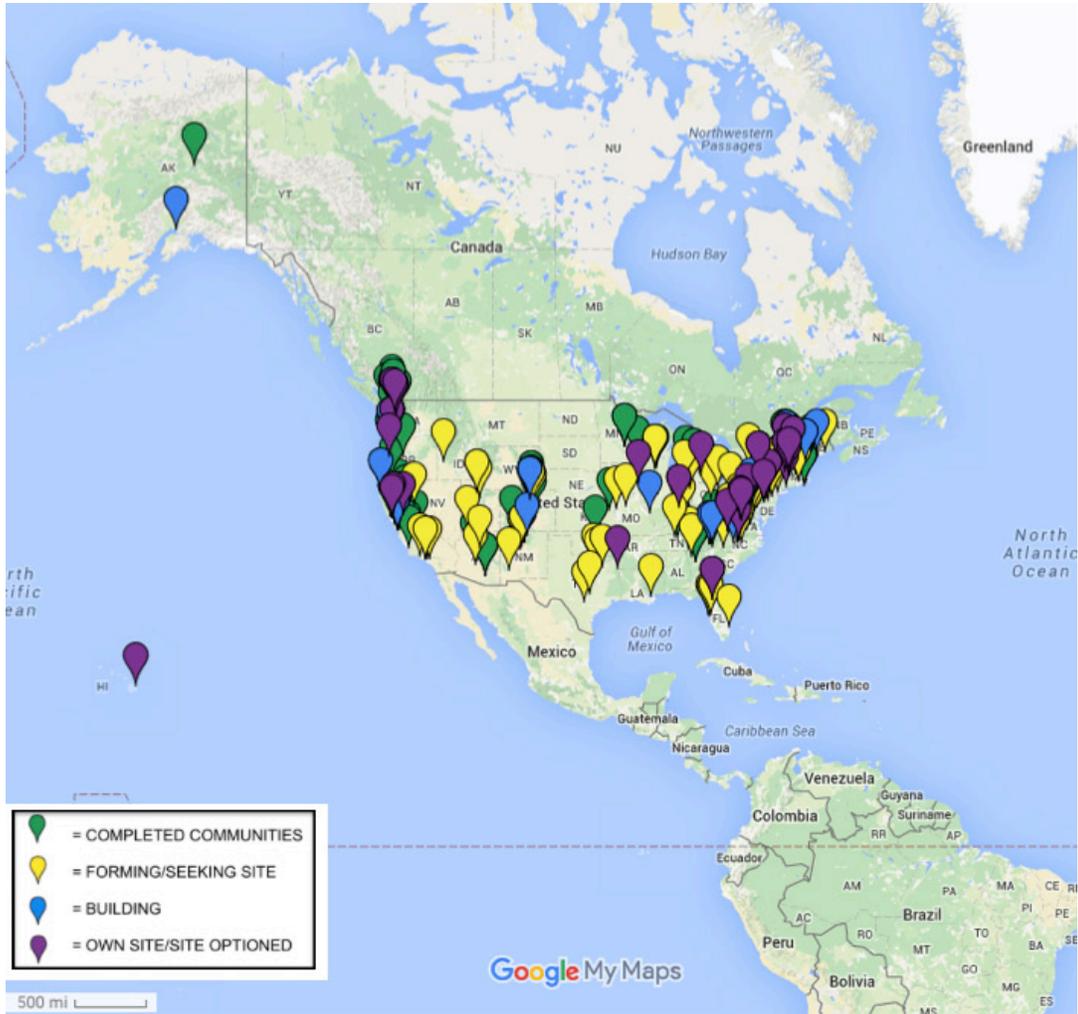


Figure 1. Distribution of cohousing communities in the United States (Godwin, 2015)



Figure 2. Distribution of cohousing communities in the lower 48 states (Godwin, 2015)

Despite the difficulties of establishing cohousing communities in the U.S., living in such a setting can be an environmentally and socially friendly alternative to living in a traditional subdivision (Fromm, 2000; Williams 2008). Williams (2005) states that certain design characteristics of cohousing communities, such as proximity of houses, density of neighborhood, and availability of community spaces encourage socialization between neighbors. In another study, Williams (2008) analyzes different data published on cohousing around the world. He argues that the strong community ties and high-density characteristic of such developments enhance resource sharing, as well as efficient use of land and energy.

This study strives to answer the research question: what is the role of outdoor spaces in the socialization of cohousing communities? More specifically, I

intended to address the following questions: 1) Where, in the landscape, and how often do residents interact?; and 2) What are the main outdoor activities that bring residents together?

Through a literature review, site observations and the raw data provided by cohousing experts, the goal of this study is to propose design guidelines that will help forming groups and facilitators to identify the most important landscape features and outdoor programming for their communities.

CHAPTER 2

LITERATURE REVIEW

2.1 Cohousing Design Characteristics

According to Williams (2005), a senior lecturer in Sustainable Urbanism at University College London and long-term environmental sustainability researcher, design plays a crucial role in the socialization of a community. Some of the main characteristics identified by the author that affect social interaction are: 1) proximity, 2) density, 3) size 4) location of parking, 5) availability of communal spaces, 6) building height and 7) size of private spaces. Cohousing can be considered a “pocket neighborhood,” which Chapin (2011) defines as a community containing clustered groups of houses organized around shared space (i.e. courtyard, pedestrian streets, etc.). These neighborhoods allow people to meet due to the proximity of the houses, the availability of common spaces and sharing similar of actions, such as retrieving mail from the common house, which increase levels of interaction between community members (Festinger et al., 1950). McCamant & Durrett (2011) have found that a distance of 25-40 feet is “a good distance from front door to front door” that allows for interaction in between neighbors while still providing privacy.

Additionally, the density of a neighborhood also impacts social engagement (Coleman, 1990). Cohousing usually adopts high-density development strategies in order to locate houses near each other as well as to preserve open space, if located

in rural or small town settings (McCamant & Durrett, 2011). However, this density is also typically balanced with other development, privacy and open space goals.

If the development is too densely settled, people may feel less in control over their neighborhood environment and withdraw from social interactions as a consequence. Having semi-private spaces between the private (houses) and public areas (common garden and common house), as well as a building layout with active areas (i.e. living room) overlooking public spaces, tends to increase the residents' ability to survey the public areas, extends their perception and allows for more inter-neighbor interactions (Birchall, 1988).

Newman (1996) also explores this subject, calling it the "defensibility of spaces." According to the author, defensible spaces are areas in which the physical layout allows for control and preservation by the residents. Especially in low-income areas, defensible spaces can help reduce crime, bring a community together and enhance the sense of ownership of the area by the residents. The goal of defensible spaces is to get people to and from their homes without the fear of harassment.

The article "Alternatives to Fear – Review of Oscar Newman's Defensible Space" (Newman, 1982) points out that crime itself is not reduced directly because of the spatial arrangement. Instead, the layout facilitates resident's engagement within the spaces and the community, putting more "eyes on the street" and, therefore, helping to reduce crime. Newman describes four elements of physical design that enhance the defensibility of spaces: (1) definition of territories by the residents, reflecting their areas of influence; (2) positioning windows so that

residents can have access to the activities outside their homes; (3) creating building exteriors that are stigma-free (low income housing created by the government tends to have the same exterior look); and (4) locating house developments in friendly neighborhoods (ibid).

McCamant and Durrett (2011) advise that in non-urban areas, six to fifteen households per acre creates a density that allows people to feel part of a neighborhood while allowing for shared landscape facilities. Urban communities could have as many sixty households per acre, by incorporating high-rise buildings each with a cohousing community per floor. The authors mention that this high-density accounts for other benefits such as making living more affordable, saving energy and resources and helping to conserve open land (ibid). Rural cohousing has the benefit of better access to land; however, the authors advise against adopting a low-density development approach, instead suggesting that groups maintain a concentration of dwelling units that approximates village development. In this sense, the benefits of cohousing will be retained while also preserving open land (ibid).

The size of a neighborhood also impacts socialization according to Fromm (1991), a researcher and consultant in innovative communities. In large area neighborhoods, people will be less likely to interact with their neighbors. Therefore, people will choose to interact with others in places where interaction is possible, such as their work or school. On the other hand, residents that live in very small neighborhoods might experience a lack of privacy and choose to withdraw socially (Williams, 2005). McCamant and Durrett (2011) define three general sizes for

cohousing communities: 1) small cohousing developments (8 to 15 households); 2) medium cohousing developments (16 to 25 households) and 3) large cohousing developments (26 to 35 households). They note that small cohousing developments are more easily organized and established, because they are less likely to suffer from opposition within the broader neighborhood. However, some costs of development are fixed, and having a small community will account for greater financial investment per household. Also, there will need to be more personal involvement (such as time to maintain grounds, cook community meals, etc.), and interviews with residents showed that many would prefer to have a larger number of households in their community (ibid).

Medium cohousing developments are considered the ideal size by McCamant & Durrett (2011). Residents report that medium sized communities allow them to have a higher number of common facilities that can be easily managed by all. They also report that while residents can know everyone in the community, they don't necessarily have to have high affinity with all. Large cohousing developments make it easier to have a more diversified community, with larger and higher number of common facilities at affordable rates. However, larger communities may attract increased neighborhood opposition and in these cases it is advisable to have experienced developers work with the forming group (ibid). The authors also note that all communities they studied in Denmark and Netherlands that had more than 34 households were divided into smaller clusters to preserve a sense of community (ibid).

Another important design factor in cohousing communities is that parking is generally located on the periphery of the neighborhood and connected to houses via shared paths. This arrangement increases the chances of neighbors seeing and interacting with each other while accessing their homes via shared paths (Williams, 2005). McCamant and Durrett (2011) suggest that a limited number of paths lead from individual dwellings to parking areas in order to increase neighbor-to-neighbor contact. They advise that each community have 1.5 parking spaces per residence, and that these areas be composed of environmentally friendly materials such as gravel. They also discourage activities such as bicycling and skateboarding, as a means of increasing overall safety in the community (McCamant & Durrett, 2011).

Another benefit of limiting vehicular circulation within the core of the neighborhood is that it increases what Appleyard and Lintell (1982) call the “livability of the street.” The authors define Livable Streets as places where social interaction between people occurs as well as where there is the presence of territorial extent and environmental awareness (ibid). Also, livable streets either completely lack or have low levels of noise, stress and pollution. Vehicular traffic is described as being a critical factor influencing the livability of streets (ibid). It introduces traffic hazards to an area, creating the risk of accidents, as well as increasing levels of noise and pollution. The authors found that neighbors are also less likely to interact with each other in streets with high levels of traffic. The presence of vehicles can influence the demographics of an area as well. It was noted in their study that families with young children, and wealthy people were less likely

to live on streets that experienced a high car volume. The elderly and those with financial difficulties were unable to move and, therefore, found themselves “stuck” on such streets, which characterizes a scenario of social vulnerability. Additionally, Appleyard and Lintell (1982) found that people tend to rent instead of owning houses in such streets. At the same time, the opposite holds true. The authors found that streets with low car traffic had a more active community. Neighbors knew each other and considered the street as part of their home territory. They also knew physical details about their street, which indicates a high environmental awareness of the area.

The presence of communal areas, both indoors and outdoors, encourages social interactions within a neighborhood. One of the main aspects of cohousing is the presence of shared community buildings, or a common house (Chapin, 2011; McCamant & Durrett, 2011). In the common house, residents gather periodically to share meals, meetings and perform other activities such as childcare and laundry. In order to be easily accessible and visible to residents, the common house is usually centrally located within the community (ibid). The design, size and types of amenities available in the common house vary significantly depending on the community size, needs and budget (ibid).. In the landscape, centrally located common spaces such as lawn, gardens, and barbecue areas are easily surveyed by the residents, which increases their sense of safety and allow for people to communicate and perform activities together (McCamant & Durrett, 1994). Other outdoor community spaces can include a sauna, tool and garden sheds.

Additionally, people living in multi-story buildings demonstrate lower levels of interest in engaging in activities occurring outside of their units (Abu-Gazze 1999). Abu-Gazze (1999) conducted a study in neighborhoods of Abu-Naiser, Jordan relating design with the social life of the community. He surveyed 400 residents within six neighborhoods and concluded that residents in multi-story buildings find it too inconvenient to join activities happening outside of their units such as small gatherings, barbecues and sporting activities (ibid). Along these lines, Williams (2005) suggest that building heights be limited to one or two stories to maximize social interaction between residents.

Finally, with fewer private spaces than usual suburban communities, cohousing residents tend to spend more time in common areas as long as those are provided (Marcus & Dovey, 1991). Therefore, smaller front and back yards, along with the smaller residential units as found in cohousing communities, have a positive effect on the socialization of the neighborhood. However, McCamant and Durrett (2011) recommend designing for a balance between privacy and community spaces. Semi-private spaces such as landscaping and porches allow for transition zones between community spaces (such as shared paths) and private dwellings.

2.2 Cohousing and Sustainability

Cohousing is a sustainable option to traditional housing types (Marcus & Dovey, 1990; McCamant & Durrett, 2011; Williams, 2008). Williams (2008) states that the cohousing model “does appear to fulfill some sustainability objectives:

strong social networks and social cohesion, pro-environmental behavior and a greater sense of well-being amongst residents.” Strong social networks and cohesion allow for residents to share resources (such as car-sharing, lawn mowers, laundry facilities, etc.), and the high-density characteristic of these neighborhoods allows for lower use of land for the purposes of housing (Williams, 2008).

According to McCamant & Durrett (2011), “sustainability is the natural order of cohousing.” They argue that cohousing achieves environmental, social and economic sustainability. As discussed above, the social sustainability component arises due to the presence of strong social networks and cohesion (McCamant & Durrett, 2011; Williams, 2008). Environmentally, cohousing achieves sustainability when establishing car-free, pedestrian-friendly environments, strives to place the community close to services, and promotes energy conservation through green buildings and renewable energy sources (McCamant & Durrett, 2011). Economically, cohousing contributes to mixed-use, mixed-income and intergenerational communities, and unlike traditional suburbs, they are more likely to thrive when faced with economic pressures (ibid).

On the other hand, certain arguments suggest that participation in a cohousing community doesn’t necessarily mean people will be living more environmentally responsible lifestyles (Lietart, 2010). Lietart states that this is highly dependent on individual lifestyle choices. It also doesn’t mean that a certain community will have high levels of socialization because they live in a cohousing setting. Socialization between residents varies highly from community to community, with some limiting to a couple of communal meals per week and only

CHAPTER 1

INTRODUCTION

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The cohousing movement started in northern Europe in the 1970's, and was brought to the U.S. in the 1990's (Fromm, 2000; Williams, 2008). In both parts of the world, cohousing started as a grass-roots initiative, but while it developed in both social and private sectors in Europe, it was limited to the private sector in the U.S. (Williams, 2008). In northern Europe, governments have recognized the social and environmental advantages of cohousing communities, so top-down approaches are usually observed in the development of this type of housing (Williams, 2008). In the U.S., the cohousing movement is still largely a resident-led process and, thus highly dependent upon public demand (Williams, 2008). When developing a

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In his book *Senior Cohousing*, Charles Durrett (2009) lists six components of cohousing: 1) participatory process; 2) deliberate neighborhood design; 3) extensive common facilities; 4) complete resident management; 5) non-hierarchical structure and 6) separate income sources. Forming groups are typically composed of individuals and families interested in establishing a new cohousing community for themselves. They are involved in all stages of establishing cohousing, including the design process, permitting and acquiring construction funds (ibid). Therefore, future residents interact and collaborate long before the cohousing is built, which indicates that community starts forming in the first stages of planning cohousing (ibid). As described above, the design of a cohousing neighborhood is planned to maximize community interaction and collaboration. Shared facilities, such as common houses, gardens and parking play a major role in sustaining community interactions. Many different planned and unplanned activities occur in shared areas, and usually the residents are responsible for maintaining these spaces as a group.

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beliefs, and homes are privately owned” (Chapin, 2011). According to Durrett (2009), tethering a primary income source to the community as a whole can change neighbor dynamics and fundamentally is beyond the scope of cohousing.

According to the Cohousing Association of the United States’ map, edited by Godwin (2015), there are 161 established communities, with 135 completed and 26 in the construction phase. An additional 22 projects have secured building sites and 99 are in the initial stages of group formation and planning (Figures 1 and 2). As demonstrated by the map, there are many cohousing communities clustered along the east and west coasts of the U.S. and most of them are located near large cities or near university towns (Margolis & Entin, 2011). According to the 2011 National Survey of Cohousing Residents, cohousing communities “reported their location as suburban or small town (44%), urban (39%) and rural (17%)” (Margolis & Entin, 2011).

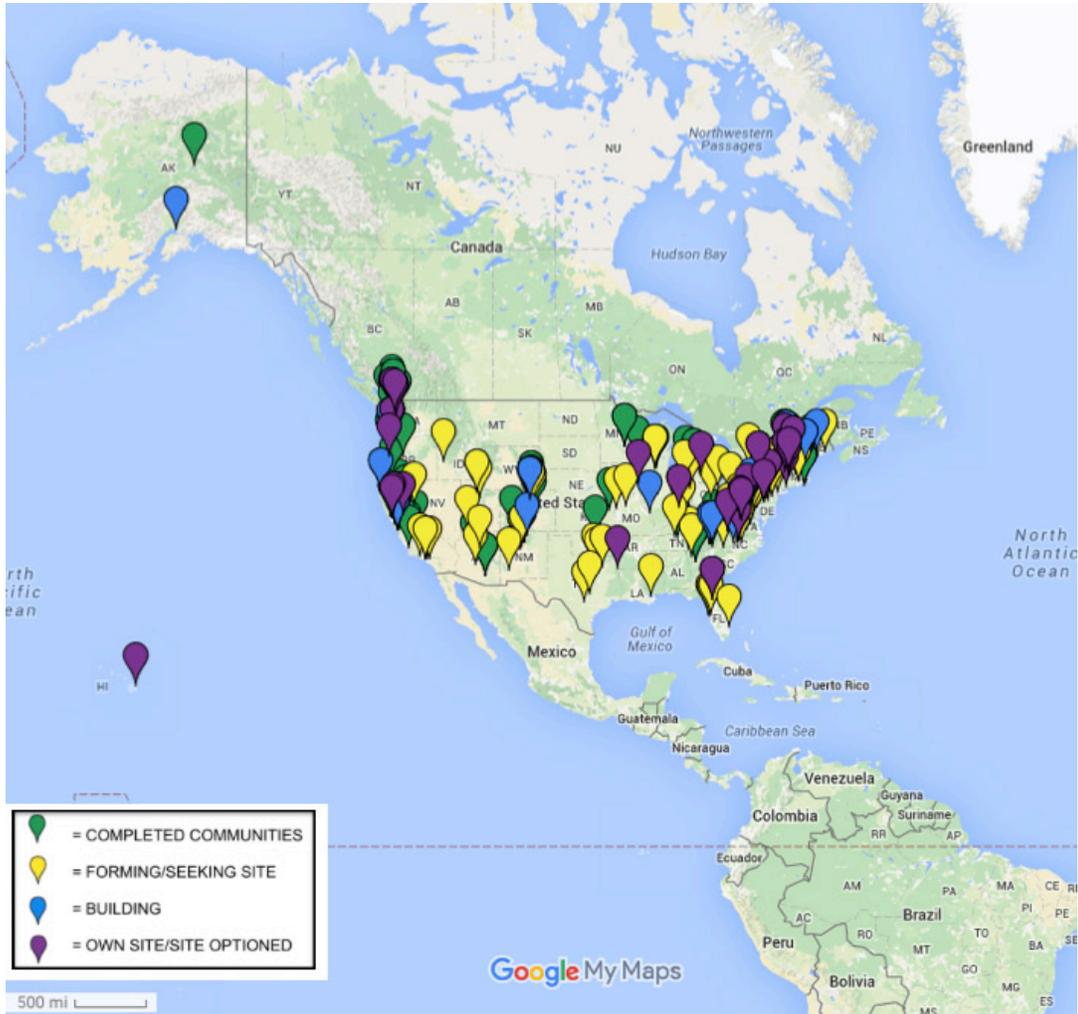


Figure 1. Distribution of cohousing communities in the United States (Godwin, 2015)



Figure 2. Distribution of cohousing communities in the lower 48 states (Godwin, 2015)

Despite the difficulties of establishing cohousing communities in the U.S., living in such a setting can be an environmentally and socially friendly alternative to living in a traditional subdivision (Fromm, 2000; Williams 2008). Williams (2005) states that certain design characteristics of cohousing communities, such as proximity of houses, density of neighborhood, and availability of community spaces encourage socialization between neighbors. In another study, Williams (2008) analyzes different data published on cohousing around the world. He argues that the strong community ties and high-density characteristic of such developments enhance resource sharing, as well as efficient use of land and energy.

This study strives to answer the research question: what is the role of outdoor spaces in the socialization of cohousing communities? More specifically, I

intended to address the following questions: 1) Where, in the landscape, and how often do residents interact?; and 2) What are the main outdoor activities that bring residents together?

Through a literature review, site observations and the raw data provided by cohousing experts, the goal of this study is to propose design guidelines that will help forming groups and facilitators to identify the most important landscape features and outdoor programming for their communities.

CHAPTER 2

LITERATURE REVIEW

2.1 Cohousing Design Characteristics

According to Williams (2005), a senior lecturer in Sustainable Urbanism at University College London and long-term environmental sustainability researcher, design plays a crucial role in the socialization of a community. Some of the main characteristics identified by the author that affect social interaction are: 1) proximity, 2) density, 3) size 4) location of parking, 5) availability of communal spaces, 6) building height and 7) size of private spaces. Cohousing can be considered a “pocket neighborhood,” which Chapin (2011) defines as a community containing clustered groups of houses organized around shared space (i.e. courtyard, pedestrian streets, etc.). These neighborhoods allow people to meet due to the proximity of the houses, the availability of common spaces and sharing similar of actions, such as retrieving mail from the common house, which increase levels of interaction between community members (Festinger et al., 1950). McCamant & Durrett (2011) have found that a distance of 25-40 feet is “a good distance from front door to front door” that allows for interaction in between neighbors while still providing privacy.

Additionally, the density of a neighborhood also impacts social engagement (Coleman, 1990). Cohousing usually adopts high-density development strategies in order to locate houses near each other as well as to preserve open space, if located

in rural or small town settings (McCamant & Durrett, 2011). However, this density is also typically balanced with other development, privacy and open space goals.

If the development is too densely settled, people may feel less in control over their neighborhood environment and withdraw from social interactions as a consequence. Having semi-private spaces between the private (houses) and public areas (common garden and common house), as well as a building layout with active areas (i.e. living room) overlooking public spaces, tends to increase the residents' ability to survey the public areas, extends their perception and allows for more inter-neighbor interactions (Birchall, 1988).

Newman (1996) also explores this subject, calling it the "defensibility of spaces." According to the author, defensible spaces are areas in which the physical layout allows for control and preservation by the residents. Especially in low-income areas, defensible spaces can help reduce crime, bring a community together and enhance the sense of ownership of the area by the residents. The goal of defensible spaces is to get people to and from their homes without the fear of harassment.

The article "Alternatives to Fear – Review of Oscar Newman's Defensible Space" (Newman, 1982) points out that crime itself is not reduced directly because of the spatial arrangement. Instead, the layout facilitates resident's engagement within the spaces and the community, putting more "eyes on the street" and, therefore, helping to reduce crime. Newman describes four elements of physical design that enhance the defensibility of spaces: (1) definition of territories by the residents, reflecting their areas of influence; (2) positioning windows so that

residents can have access to the activities outside their homes; (3) creating building exteriors that are stigma-free (low income housing created by the government tends to have the same exterior look); and (4) locating house developments in friendly neighborhoods (ibid).

McCamant and Durrett (2011) advise that in non-urban areas, six to fifteen households per acre creates a density that allows people to feel part of a neighborhood while allowing for shared landscape facilities. Urban communities could have as many sixty households per acre, by incorporating high-rise buildings each with a cohousing community per floor. The authors mention that this high-density accounts for other benefits such as making living more affordable, saving energy and resources and helping to conserve open land (ibid). Rural cohousing has the benefit of better access to land; however, the authors advise against adopting a low-density development approach, instead suggesting that groups maintain a concentration of dwelling units that approximates village development. In this sense, the benefits of cohousing will be retained while also preserving open land (ibid).

The size of a neighborhood also impacts socialization according to Fromm (1991), a researcher and consultant in innovative communities. In large area neighborhoods, people will be less likely to interact with their neighbors. Therefore, people will choose to interact with others in places where interaction is possible, such as their work or school. On the other hand, residents that live in very small neighborhoods might experience a lack of privacy and choose to withdraw socially (Williams, 2005). McCamant and Durrett (2011) define three general sizes for

cohousing communities: 1) small cohousing developments (8 to 15 households); 2) medium cohousing developments (16 to 25 households) and 3) large cohousing developments (26 to 35 households). They note that small cohousing developments are more easily organized and established, because they are less likely to suffer from opposition within the broader neighborhood. However, some costs of development are fixed, and having a small community will account for greater financial investment per household. Also, there will need to be more personal involvement (such as time to maintain grounds, cook community meals, etc.), and interviews with residents showed that many would prefer to have a larger number of households in their community (ibid).

Medium cohousing developments are considered the ideal size by McCamant & Durrett (2011). Residents report that medium sized communities allow them to have a higher number of common facilities that can be easily managed by all. They also report that while residents can know everyone in the community, they don't necessarily have to have high affinity with all. Large cohousing developments make it easier to have a more diversified community, with larger and higher number of common facilities at affordable rates. However, larger communities may attract increased neighborhood opposition and in these cases it is advisable to have experienced developers work with the forming group (ibid). The authors also note that all communities they studied in Denmark and Netherlands that had more than 34 households were divided into smaller clusters to preserve a sense of community (ibid).

Another important design factor in cohousing communities is that parking is generally located on the periphery of the neighborhood and connected to houses via shared paths. This arrangement increases the chances of neighbors seeing and interacting with each other while accessing their homes via shared paths (Williams, 2005). McCamant and Durrett (2011) suggest that a limited number of paths lead from individual dwellings to parking areas in order to increase neighbor-to-neighbor contact. They advise that each community have 1.5 parking spaces per residence, and that these areas be composed of environmentally friendly materials such as gravel. They also discourage activities such as bicycling and skateboarding, as a means of increasing overall safety in the community (McCamant & Durrett, 2011).

Another benefit of limiting vehicular circulation within the core of the neighborhood is that it increases what Appleyard and Lintell (1982) call the “livability of the street.” The authors define Livable Streets as places where social interaction between people occurs as well as where there is the presence of territorial extent and environmental awareness (ibid). Also, livable streets either completely lack or have low levels of noise, stress and pollution. Vehicular traffic is described as being a critical factor influencing the livability of streets (ibid). It introduces traffic hazards to an area, creating the risk of accidents, as well as increasing levels of noise and pollution. The authors found that neighbors are also less likely to interact with each other in streets with high levels of traffic. The presence of vehicles can influence the demographics of an area as well. It was noted in their study that families with young children, and wealthy people were less likely

to live on streets that experienced a high car volume. The elderly and those with financial difficulties were unable to move and, therefore, found themselves “stuck” on such streets, which characterizes a scenario of social vulnerability. Additionally, Appleyard and Lintell (1982) found that people tend to rent instead of owning houses in such streets. At the same time, the opposite holds true. The authors found that streets with low car traffic had a more active community. Neighbors knew each other and considered the street as part of their home territory. They also knew physical details about their street, which indicates a high environmental awareness of the area.

The presence of communal areas, both indoors and outdoors, encourages social interactions within a neighborhood. One of the main aspects of cohousing is the presence of shared community buildings, or a common house (Chapin, 2011; McCamant & Durrett, 2011). In the common house, residents gather periodically to share meals, meetings and perform other activities such as childcare and laundry. In order to be easily accessible and visible to residents, the common house is usually centrally located within the community (ibid). The design, size and types of amenities available in the common house vary significantly depending on the community size, needs and budget (ibid).. In the landscape, centrally located common spaces such as lawn, gardens, and barbecue areas are easily surveyed by the residents, which increases their sense of safety and allow for people to communicate and perform activities together (McCamant & Durrett, 1994). Other outdoor community spaces can include a sauna, tool and garden sheds.

Additionally, people living in multi-story buildings demonstrate lower levels of interest in engaging in activities occurring outside of their units (Abu-Gazze 1999). Abu-Gazze (1999) conducted a study in neighborhoods of Abu-Naiser, Jordan relating design with the social life of the community. He surveyed 400 residents within six neighborhoods and concluded that residents in multi-story buildings find it too inconvenient to join activities happening outside of their units such as small gatherings, barbecues and sporting activities (ibid). Along these lines, Williams (2005) suggest that building heights be limited to one or two stories to maximize social interaction between residents.

Finally, with fewer private spaces than usual suburban communities, cohousing residents tend to spend more time in common areas as long as those are provided (Marcus & Dovey, 1991). Therefore, smaller front and back yards, along with the smaller residential units as found in cohousing communities, have a positive effect on the socialization of the neighborhood. However, McCamant and Durrett (2011) recommend designing for a balance between privacy and community spaces. Semi-private spaces such as landscaping and porches allow for transition zones between community spaces (such as shared paths) and private dwellings.

2.2 Cohousing and Sustainability

Cohousing is a sustainable option to traditional housing types (Marcus & Dovey, 1990; McCamant & Durrett, 2011; Williams, 2008). Williams (2008) states that the cohousing model “does appear to fulfill some sustainability objectives:

strong social networks and social cohesion, pro-environmental behavior and a greater sense of well-being amongst residents.” Strong social networks and cohesion allow for residents to share resources (such as car-sharing, lawn mowers, laundry facilities, etc.), and the high-density characteristic of these neighborhoods allows for lower use of land for the purposes of housing (Williams, 2008).

According to McCamant & Durrett (2011), “sustainability is the natural order of cohousing.” They argue that cohousing achieves environmental, social and economic sustainability. As discussed above, the social sustainability component arises due to the presence of strong social networks and cohesion (McCamant & Durrett, 2011; Williams, 2008). Environmentally, cohousing achieves sustainability when establishing car-free, pedestrian-friendly environments, strives to place the community close to services, and promotes energy conservation through green buildings and renewable energy sources (McCamant & Durrett, 2011). Economically, cohousing contributes to mixed-use, mixed-income and intergenerational communities, and unlike traditional suburbs, they are more likely to thrive when faced with economic pressures (ibid).

On the other hand, certain arguments suggest that participation in a cohousing community doesn’t necessarily mean people will be living more environmentally responsible lifestyles (Lietart, 2010). Lietart states that this is highly dependent on individual lifestyle choices. It also doesn’t mean that a certain community will have high levels of socialization because they live in a cohousing setting. Socialization between residents varies highly from community to community, with some limiting to a couple of communal meals per week and only

sharing a minimum amount of spaces and activities (Lietart, 2010). Williams (2008) also explores a key criticism of cohousing that weakens the sustainability argument. The author states that in the U.S. overall, and in other European countries, cohousing residents are a homogenous group of “affluent, white, and well-educated” people. This type of housing, due to the lack of top-down, governmental support, is costly to develop and excludes low-income groups (Lietart, 2010; Williams, 2008).

2.3 Cohousing and connection to nature

Sanguinetti (2014) studied the role of transformational practices that promote connection to community and to nature in cohousing. She explored the “Self-expansion Model,” by Aron & Aron (1986), which states that inclusion of “other’s in one sense of self” leads to “more pro-social behavior” (Sanguinetti, 2014). This model was adapted to also evaluate the connectedness of cohousing residents to nature and the environment. A connection to nature increases when individuals interact with the natural environment, and in cohousing and other intentional communities, connection to the wild landscape and human cultivated landscapes are how residents express their relationship to nature (ibid). Examples of this are “recycling, installing solar or geothermal energy systems and greywater systems, and supporting local food systems (such as gardening, involvement in CSAs, raising livestock, composting)” (ibid).

In order to evaluate how transformational practices influenced connectedness, the author developed activity categories, including “stewardship of

the natural environment” which included outdoor activities such as work days, routine ground maintenance, landscaping projects, gardening, farming and animal husbandry (Sanguinetti, 2014). This category as well as “fellowship and culture” (which includes wellness groups, parties, live music, community traditions, etc.) predicted greater connection to nature due to the fact that the activities occur outdoors (ibid).

2.4 Cohousing and New Urbanism: Can Design Solely Create Community?

According to Toker (2010), cohousing and new urbanist communities have emerged in the U.S. as alternatives to standard suburban housing types. In 1996, the Congress for the New Urbanism stated that “the leading current movement directed toward combating urban sprawl and creating compact, walkable neighborhoods is a professionally based movement called the New Urbanism” (Congress for the New Urbanism, 1996). New Urbanist proponents criticize modern forms of development that cause sprawl, environmental deterioration, and strive to create a “sense of community” through physical design (Congress for the New Urbanism, 1996; Talen, 1999). Katz (1994) states that a close-knit community can be generated by building neighborhoods according to New Urbanist principles. However, studies such as the one conducted by Talen (1999), show that physical design itself cannot create a sense of community, but instead can only increase its probability. Other factors like the length of residency, shared ideals and the quality of interactions are crucial when trying to analyze the “sense of community” felt by residents (ibid).

In her 2010 study, Toker explores how the design of cohousing and new urbanist communities affect the role of their female residents, and found that cohousing developments tend to attract residents with more equalitarian gender ideologies than new urbanist communities. Cohousing communities contain shared spaces and resources and strong community networks, which enable individuals to spend less time on housework tasks (Toker, 2010). While they feature a higher density than suburban neighborhoods, the typical new urbanist layout of individualized, isolated suburban-like homes account for lower community interaction than cohousing developments (ibid). Williams (2008) states that even though the design characteristics of cohousing communities such as high density, smaller dwelling units and access to shared common spaces with different functions play a role in the interaction of the community, social and personal values also have to be taken into consideration when analyzing social interaction (i.e. residents ideals).

2.5 Programming: Activities in Cohousing

Choi (2004) analyzed twenty-eight elderly cohousing communities in both Denmark and the Netherlands. He states that the most common activities were steering committee meetings, as well as coffee and community meals occurring once or several times a month to every three months. Around 30% of the people analyzed in the study attend these events frequently (Choi, 2004). Other activities organized by cohousing communities include exercise classes, cultural events and parties (Williams, 2008). Additionally, many communities take on the maintenance role of

their space utilizing resident-led efforts, which increases socialization among the residents (Pioneer Valley Cohousing, n.d.; Williams, 2005).

2.6 Other Factors Influencing Socialization in Cohousing

According to Williams (2005), the design of a cohousing community is not the only variable that influences socialization. Also, aside from factors such as personal traits, informal and formal social factors also play a role in how cohesive a community becomes (Williams, 2005). The author states that personal factors are largely influenced by each individual's background (such as culture, social class, religion, etc.), their personalities and beliefs, and how they interact with others (ibid). Informal social factors are those that related to resources that might influence social interactions, such as health and time (ibid). Formal social factors are policies and structures that guide interactions in between people, usually set during the initial participatory process, such as social structures and organization of activities (ibid).

2.7 Cohousing: Successful Alternatives for Different Groups

According to Tchoukaleyska (2011), the design and structure of cohousing communities allow for greater safety for children through control of traffic, and parental oversight of bullies and strangers . She conducted a series of interviews with members of two cohousing communities in central Canada. Both communities were centrally located within urban areas, which allowed the residents access to the amenities of the city as well as the benefits of living in a cohousing community. Parents stated that the close-knit community they lived in allowed for many

different adults to watch the children, as well as easier access to playmates for their children and reduced necessity to enroll them in after-school activities (Tchoukaleyska, 2011) . Even though this article sheds a light on cohousing and safety, it has a small survey number and therefore must be considered limited in scope.

Living in a cohousing environment can bring positive outcomes for the elderly as well. Glass & Vander Platts (2013) conducted a study in an elder cohousing community, interviewing twenty-six residents mostly females averaging 73 years of age. The authors found out that living in a cohousing community brought about feelings of “mutual support, increased acceptance of aging, and feelings of safety/less worrying/lessening of social isolation” (Glass & Vander Platts, 2013). Bamford (2005) interviewed seniors living in seven different cohousing neighborhoods in the Netherlands and Denmark in order to elucidate the idea of cohousing for the elderly. The author concluded that in these countries, cohousing is a well-established alternative of living for the elderly. One of the studied communities, Det Kreative Seniorbo (DKS) in Odense, Denmark, was originally created by an older study group that participated on the design process for the cohousing community (Bamford 2005). Different aspects of the community layout and architectural design have to be approved by the council of residents, as well as new residents (ibid). The DKS hold weekly meet ups, monthly meals and meetings, and seasonal field trips for their residents (ibid). Bamford emphasizes the importance of residents’ participation in the design process, management and choice of neighbors in order to have a successful and interactive community.

Another study analyzes the level of satisfaction of 536 elder individuals living in 28 cohousing communities across Denmark and Sweden (Choi, 2004). The study concluded that 95% of the individuals in the study were satisfied with their living conditions (rating it as 'good' and 'very good'), 97.5% would recommend living in cohousing to other elders and most of them would not consider moving out of such communities (ibid).

In her study "Transformational Practices in Cohousing: Enhancing Resident's Connection to Community and Nature," Sanguinetti (2014) focused on studying formal cohousing practices, and noted that " future research should investigate the contributions of less formal practices (...) such as spontaneous conversations on community pathways and porches and psychological responses to community design features" (Sanguinetti, 2014). Therefore, the present research serves as an opportunity to explore spontaneous activities, as suggested by Sanguinetti (2014), as well as provide suggestions on design of outdoor spaces in order to foster interaction.

2.8 Criticism on Cohousing

It is important to notice that a number of references have a positive bias towards cohousing. McCamant & Durrett and Chapin have lived in cohousing/or small scale neighborhoods and own businesses that provide services to established communities and forming cohousing groups. The present study analyzes cohousing through the lens of design in order to explore best practices in the landscape. Most of the published information available related to design in cohousing comes from

practitioners such as McCamant & Durrett, Chapin and Kraus Fitch Architects (as seen on Section 6). As a consequence, a positive tone can be identified when describing cohousing characteristics. Therefore, it is also important to highlight criticism towards this model.

One of the main drawbacks of cohousing is the lack of affordability (Schacer, 2006). Depending on the level of customization required by residents, units in cohousing settings might have higher than market-rate pricing. Additionally, some communities charge membership dues in order to maintain common areas independently from use rates, meaning people that use spaces only sporadically pay the same than those that use it frequently (ibid). Costs can be even higher when people join the initial forming process and have to account for buying land, paying facilitators and contractors in order to get the project constructed (ibid). Therefore, cohousing communities do not have a diverse resident pool in general. As mentioned in Section 2.2, cohousing residents tend to be white, middle-aged and affluent (Williams, 2008).

Cohousers might also have limited control over their land when deciding to sell it (ibid). Some communities reserve the rights to deny potential buyers if they believe the new residents' ideals do not match with the community's ideals. Additionally, due to its intentional intentional community nature, residents in cohousing might have different ideas of privacy and individualism (ibid). Sometimes, boundaries between homes and community spaces are not clear, creating conflicting ideas of how things should look or be kept (ibid).

CHAPTER 3

METHODOLOGY

3.1 A Mixed-methods Approach

As seen in the literature, there are many aspects to socialization among cohousing residents such as site design, that encourages spontaneous activities, formal practices, such as periodic meals and meetings, and individual ideals. In order to explore how different spaces and site layouts foster both planned and unplanned activities, I used the following mixed-methods approach: 1) a literature review (Ruiu, 2014; Toker, 2010); 2) spatial analysis (Abu-Ghazze, 1999; Marcus, 2000; Toker, 2010); 3) case studies (Meltzer, 2000; Toker, 2010; Williams, 2008); 4) on-site observations (Choi, 2004; Abu-Ghazze, 1999; Marcus, 2000; Toker, 2010); 5) personal conversations with cohousing experts (Choi, 2004; Sanguinetti, 2014), and 6) an analysis of the 2011 Survey of Cohousing Communities.

A literature review was conducted in order to evaluate the most important factors influencing socialization in communities. The variables of design, social and personal factors have been reported by some authors as important factors to be considering when evaluating socialization (Choi, 2004; Talen, 1999; Williams, 2005). The information acquired through the literature review influence the set of recommendations in Chapter 6.

Three case studies that reflect varying degrees of available outdoor spaces in Western Massachusetts were chosen. They are the following: 1) Pioneer Valley Cohousing in Amherst, MA; 2) Pine Street Cohousing in Amherst, MA and 3) Rocky

Hill Cohousing in Northampton, MA (Figure 3). In each of the three communities, a spatial analysis of the surrounding landscape and zoning, layout, on-site observations and informal conversations with experts were conducted.



Figure 3. Map displaying all three case-study sites (Google Maps, 2016).

The analysis of surrounding landscape and zoning was conducted using data gathered from MassGIS, the Town of Amherst and City of Northampton websites. The layout spatial analysis portion of the study was conducted via plans, site

observation and Google Earth maps. I determined overall size, number of units, availability, size and types of outdoor spaces present in the community.

On-site observations were conducted in order to determine the types, location and frequency of activities and social interaction happening in outdoor areas. Stationary (i.e. sitting, talking, reading) and moving activities (i.e. playing, jogging, riding bicycle), activity location, perceived gender and age were registered following the “behavior mapping” methodology described by the Project for Public Spaces Inc. (Table 1) (Project for Public Spaces, 2000). The surrounding landscape was also taken into consideration when analyzing activities occurring outdoors (such as presence of trails, open space, farmland, etc.). Each community was visited two times during warm (temperature range 57°F- 70°F) weekend days for a period of two hours. Observations were conducted during the month of October.

Additionally, informal conversations were conducted on-site with community organizers and cohousing design experts. During these conversations, additional details were acquired about how people interact outdoors year-round, as well as present programming and stories about successful and problematic activities in outdoor environments.

3.2 Study Limitations

It is important to note the limitations of the present study, especially related to the statistical significance of site observations. As cited above, three cohousing communities were visited two times over the month of October, for a period of 2 hours each. The acquired data was used for better understanding each cohousing

layout, as well as to observe patterns that emerged from all three communities. However, in order to obtain statistically significant data, it is advised that future research increase its' sample size by looking at a larger number of communities across a certain region or types of development (rural vs. urban). Also, more frequent observations will allow for the analysis of daily, weekly and seasonal changes in outdoor activities.

Observation of spontaneous activities in cohousing is an appropriate method for acquiring quantitative data. However, in order to acquire qualitative data, such as levels of significance in activities performed outdoors, future researchers should apply self-reporting methods of data acquisition such as questionnaires and personal interviews.

Table 1. Observation table used during on-site studies

Pioneer Valley Cohousing											
Day	10/25/15 - Sunday										
Time	1:30 - 3:30 pm										
Temperature	57 F										
Weather	Cloudy										
Parking lot											
Group #	Sex			Age						Activities	
	Female	Male	Unidentified	0-6	7-18	19-34	35-50	51-65	65+		
1	1								1	Walking dog in parking lot and then into community	
Total	1	0	0	0	0	0	0	0	1	0	
Total People	1										
Private porches											
Group #	Sex			Age						Activities	
	Female	Male	Unidentified	0-6	7-18	19-34	35-50	51-65	65+		
1			1					1		working on porch - cleaning bowl	
2			1						1	working on porch - interacted with person in the paved path	
3											
Total	0	2	0	0	0	0	0	1	1	0	
Total People	2										
Paved pathway											
Group #	Sex			Age						Activities	
	Female	Male	Unidentified	0-6	7-18	19-34	35-50	51-65	65+		
1	1							1		walking into main house * under main house category	
2			2						2	riding bikes through the cohousing together	
3	1								1	walking into main house, then hauling cart into unit * under main house category	
4			1						1	walking into main house * under main house category	
5			2						2	meet each other on path, one extends a party invitation to the other	
6			1						1	riding bike	
Total	2	6	0	0	0	0	0	1	7	0	
Total People	8										
Community Garden											
Group #	Sex			Age						Activities	
	Female	Male	Unidentified	0-6	7-18	19-34	35-50	51-65	65+		
1	1								1	Walking into garden with a bucket	
Total	1	0	0	0	0	0	0	0	1	0	
Total People	1										

CHAPTER 4 RESULTS AND DISCUSSION

4.1 Case Studies

4.1.1 Pioneer Valley Cohousing

The Pioneer Valley Cohousing (42°25'6.75"N, 72°31'22.00"W) is located on a 22 acre site in Amherst, MA (Pioneer Valley Cohousing, n.d.). It has a “donut-shaped layout,” with houses in both inner and outer circle with a total of 32 housing units (Figure 5). Houses are clustered in about 6.6 acres of the site, averaging a five-house/acre density (Pioneer Valley Cohousing, n.d.; Fromm, 2000) and leaving about 15.4 acres as open space.

According to the Pioneer Valley Cohousing website, the community’s dwelling units ranged from 616 to 2280 ft², housing 63 adults and 20 children in 2009 (Pioneer Valley Cohousing, n.d.). Community members began conceptualizing the cohousing neighborhood in 1989. Five years later, in 1994, Pioneer Valley Cohousing was built to provide housing for its 84 members (ibid) There is a 4500 ft² common house (Figure 4) in the property that contains shared facilities such as a dining area and kitchen, a living room, a library, a children’s room, guest rooms, laundry facilities, a sauna, an exercise room, a food pantry, a root cellar, a meditation room and storage areas. The community also possesses an additional shared building – “the annex” – which provides a space for crafts, woodworking and equipment storage. In total there are eight detached homes, nine duplexes, and two triplexes within the complex (ibid).

At Pioneer Valley Cohousing, the maintenance of the community is performed by the residents themselves (Pioneer Valley Cohousing, n.d.). To ensure the sustainability of such resident-led work, they have “affinity groups” where residents sign up to do activities most related to their interests, an approach which avoids conflicts and brings people with similar interests together (ibid). The affinity groups are focused on specific tasks or areas of the community, including: annex, buildings and grounds, common house, community support, continuity, finance, garden , kids, landscape, laundry, library, meals, membership, and social (ibid).

Two weekly community meals are served to the cohousing members. Additionally, every fall there is a retreat where residents set aside a weekend to celebrate their community (Pioneer Valley Cohousing, n.d.). The retreat includes workshops, meals and storytelling as well as special activities for children (ibid). Therefore, it is evident that not only the design of this community, but also programming and other efforts are specifically intended to encourage the interaction in between neighbors.



Figure 4. Pioneer Valley Cohousing patio and lawn in front of common house [Personal photograph taken in Amherst, MA] (2016).

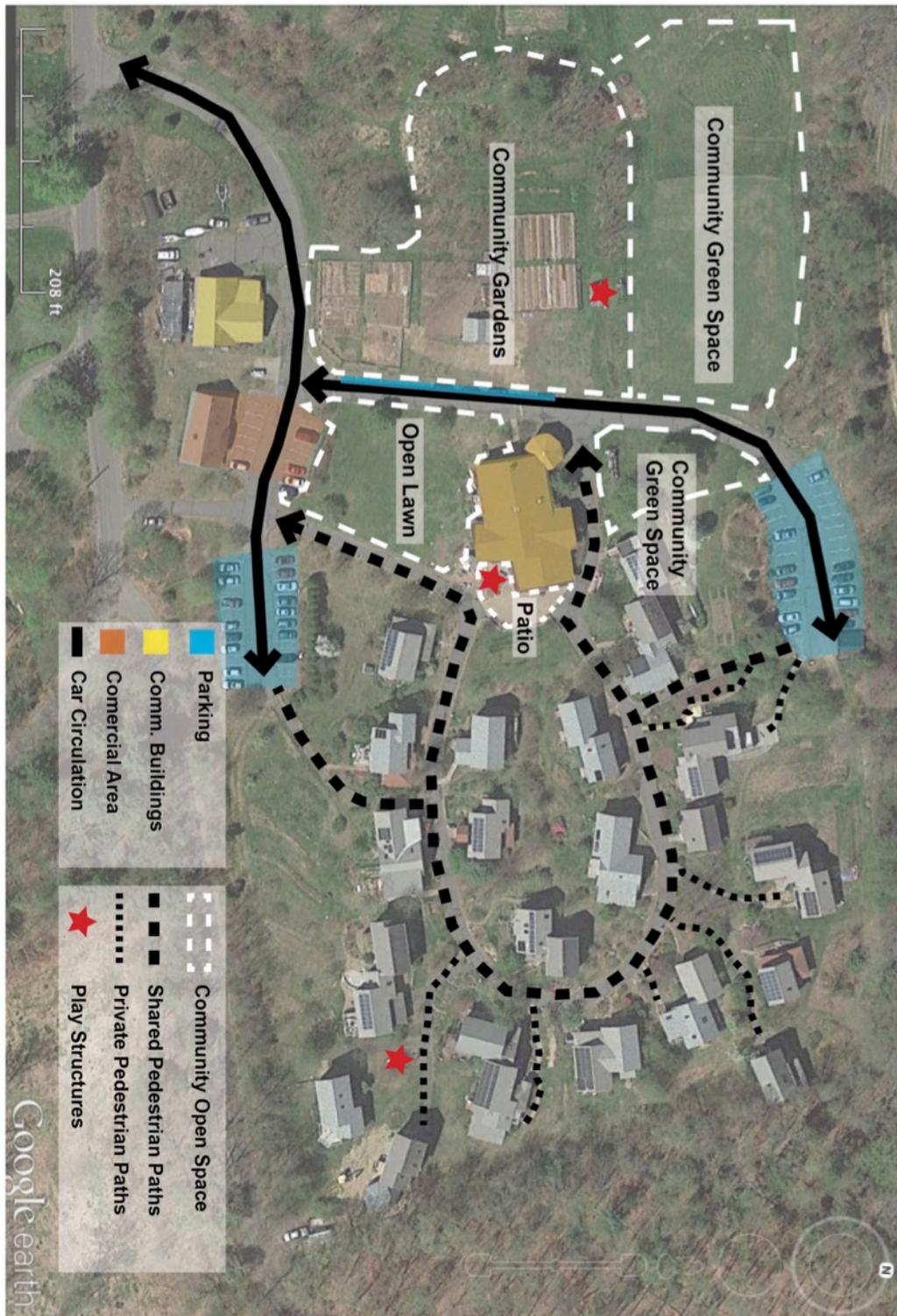


Figure 5. Spatial Analysis of the Pioneer Valley Cohousing. Map composed using Adobe Illustrator CC and Google Earth v 7.1.5.1557 ortho-imagery.

4.1.2 Pine Street Cohousing

The Pine Street Cohousing is comprised of 11 households located on a seven-acre parcel in Amherst, MA (Figure 7) (The Pine Street Cohousing Community, n.d.). The houses are clustered in about two acres of the site, resulting in a three-household per acre density, with about five acres as open space. The community is surrounded on three sides by preserved agricultural land (used for organic farming operations) and is “situated directly across from town conservation land, close to Mill River Recreation Area, the North Amherst Library, the golf course/ski area at Cherry Hill, and swimming at Puffers Pond” (ibid). They possess shared lawn space with a community garden (Figure 6), an orchard, a playground, an open field, a wooded area with a tree house, as well as a shared storage shed (ibid).

According to the Pine Street Cohousing website, the size of the community is smaller than most cohousing groups. Therefore, they believe that a having high degree of compatibility between residents is crucial for a successful and integrated community. They also believe that the “small scale enables a relatively relaxed and manageable climate for working together, for setting common goals and agendas and for getting to know and care about what’s important to each member” (The Pine Street Cohousing Community, n.d.).



Figure 6. Commons, community shed and few households at Pine Street Cohousing [Personal photograph taken in Amherst, MA] (2016).

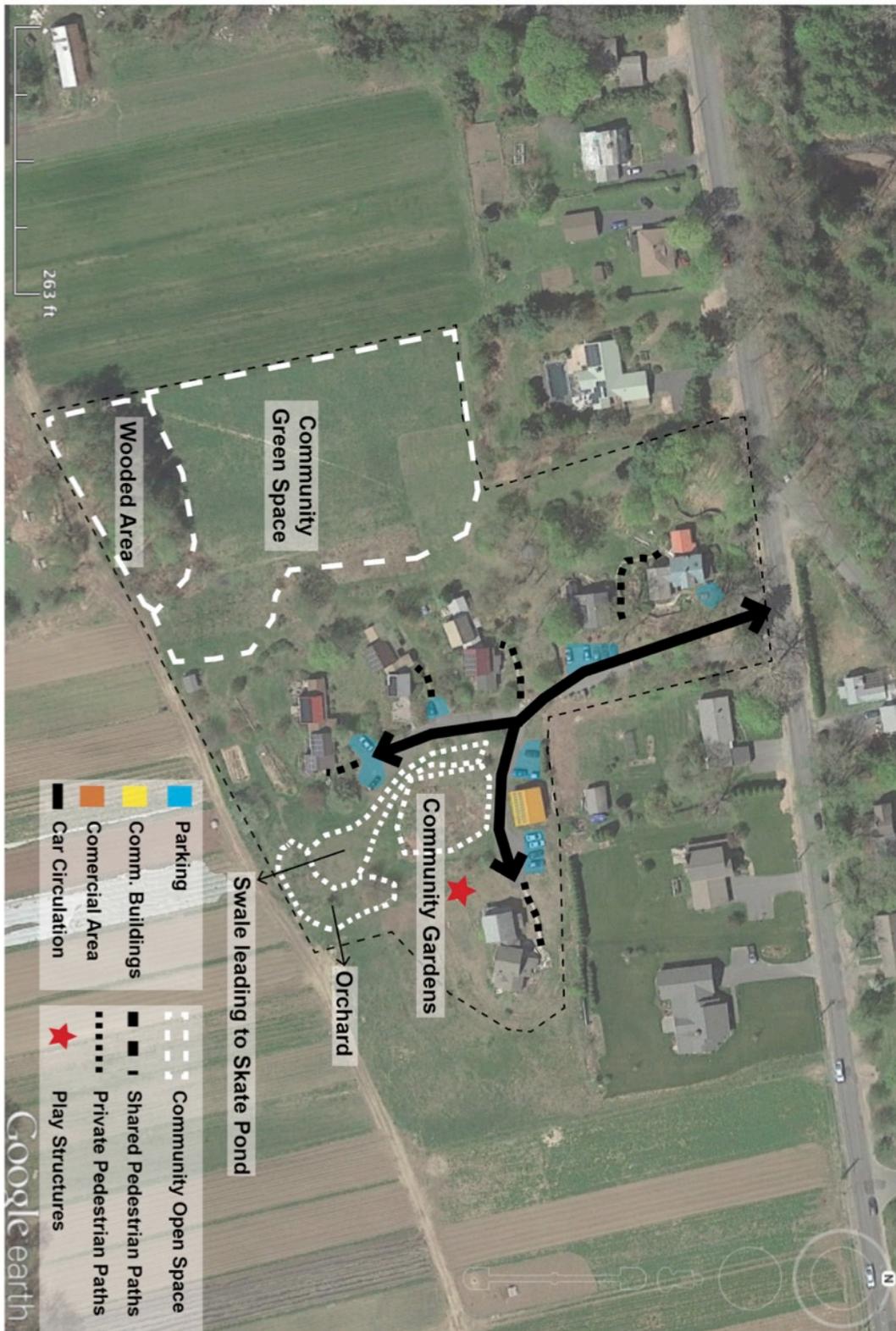


Figure 7. Pine Street Cohousing Spatial Analysis. Map composed using Adobe Illustrator CC and Google Earth v 7.1.5.1557 ortho-imagery.

4.1.3 Rocky Hill Cohousing

Rocky Hill Cohousing contains 28 households and is located on a 27-acre parcel in Northampton, MA (Figure 9). Houses are clustered within 7.4 acres of the site comprising a four-household/acre density. Most of the parcel, about 19.6 acres, is wooded open space that contains trails for the enjoyment of the community (Rocky Hill Cohousing, 2015). According to their website, they are:

“committed to creating a diverse community that will embrace and support individuals and families, and that includes people of different backgrounds - including class, ethnicity, age, gender, physical abilities, education, and sexual orientation” (Rocky Hill Cohousing, 2015).

The community contains playground space, a sandbox, a community garden, a sledding hill, wooded trails, and a bicycle trail (Rocky Hill Cohousing, 2015). The bicycle trail located on property (Figure 9) was built as a collaboration between the town of Northampton and Rocky Hill Cohousing, as part of a multi-phase project to link rural neighborhoods to the city center (Entin, personal communication, 2016). After the initial cost of \$30,000 covered by Rocky Hill Cohousing, the residents are now able to enjoy recreation opportunities year round (i.e. jogging, running and cross-country skiing) on a path maintained by the city (ibid).

As part of the community programming, members meet once a week for community meals at the common house (Rocky Hill Cohousing, 2015). Additionally, there is a group of people, ranging from 55 – 80 years old, that meets once a month around the topic “Aging gracefully in Cohousing” (Entin, 2015). According to Entin

(2015), this group has the goal to create strong bonds between residents and to appreciate the “remarkable diversity of life perspectives, and drawing inspiration from one another.”



Figure 8. Rocky Hill Cohousing pedestrian paths [Personal photograph taken in Northampton, MA] (2016).

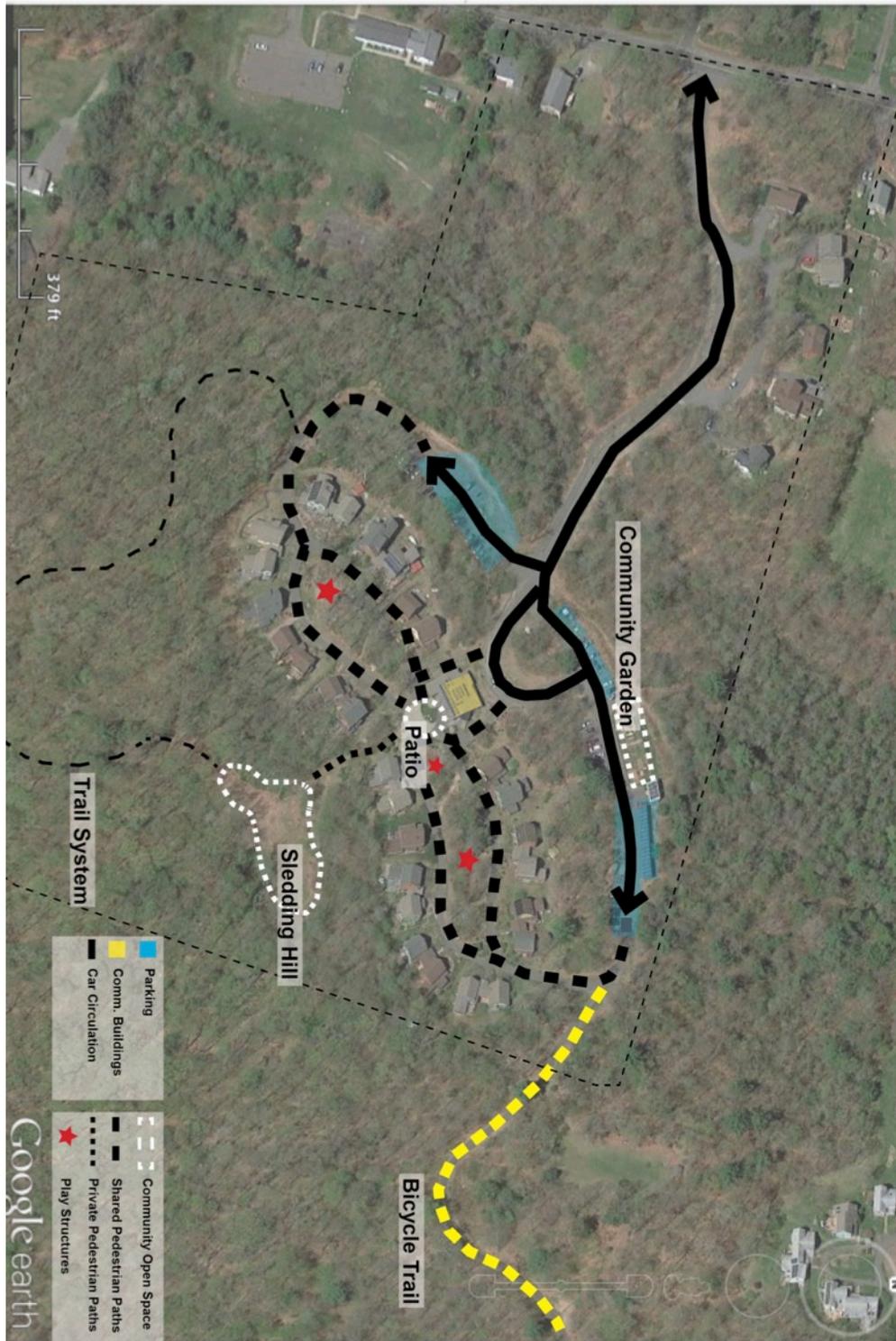


Figure 9. Rocky Hill Cohousing Spatial Analysis. Map composed using Adobe Illustrator CC and Google Earth v 7.1.5.1557 ortho-imagery.

4.2 Land Use and Zoning

Land use data from 2005 was downloaded from MassGIS.gov and manipulated in ArcMap 10.3 software by Esri, in order to analyze the settings that each cohousing includes (Figures 12-14). All three cohousing developments are surrounded by forest, farmland and recreational area to some extent. According to the U.S. Census Bureau (2002), urban areas (UAs) and urban clusters (UCs) are defined:

“(...) a UA consists of contiguous, densely settled census block groups (BGs) and census blocks that meet minimum population density requirements, along with adjacent densely settled census blocks that together encompass a population of at least 50,000 people. (...) a UC consists of contiguous, densely settled census BGs and census blocks that meet minimum population density requirements, along with adjacent densely settled census blocks that together encompass a population of at least 2,500 people, but fewer than 50,000 people.”

The minimum population density requirement for UAs and UCs is 1000 people per square mile. All other areas that do not fall into this classification are considered rural areas.

As illustrated on Figure 10, Pioneer Valley Cohousing is located in a blockgroup of 369 people per square mile, and considered to be in a rural setting (Figure 10). Pine Street Cohousing is within a 2013 people per square mile blockgroup, which matches the minimum density requirement for UAs and UCs, and

possesses adjacent blockgroups containing more than 2,500 people (Figure 10). Therefore, it is considered to be located within an urban cluster, but with access to open space and protected farmland. Rocky Hill Cohousing is located within a block group of low population density (370 people per square mile). Therefore, it is considered to be located in a rural area per Census 2000 definition (Figure 11).

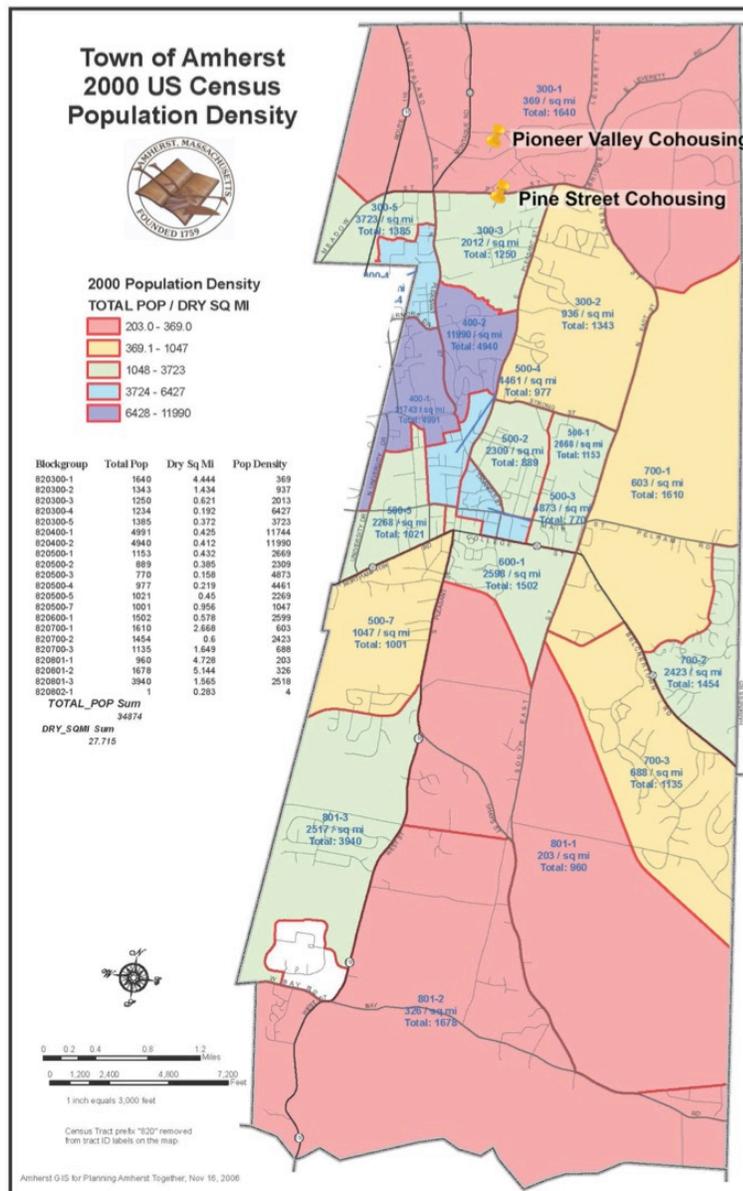
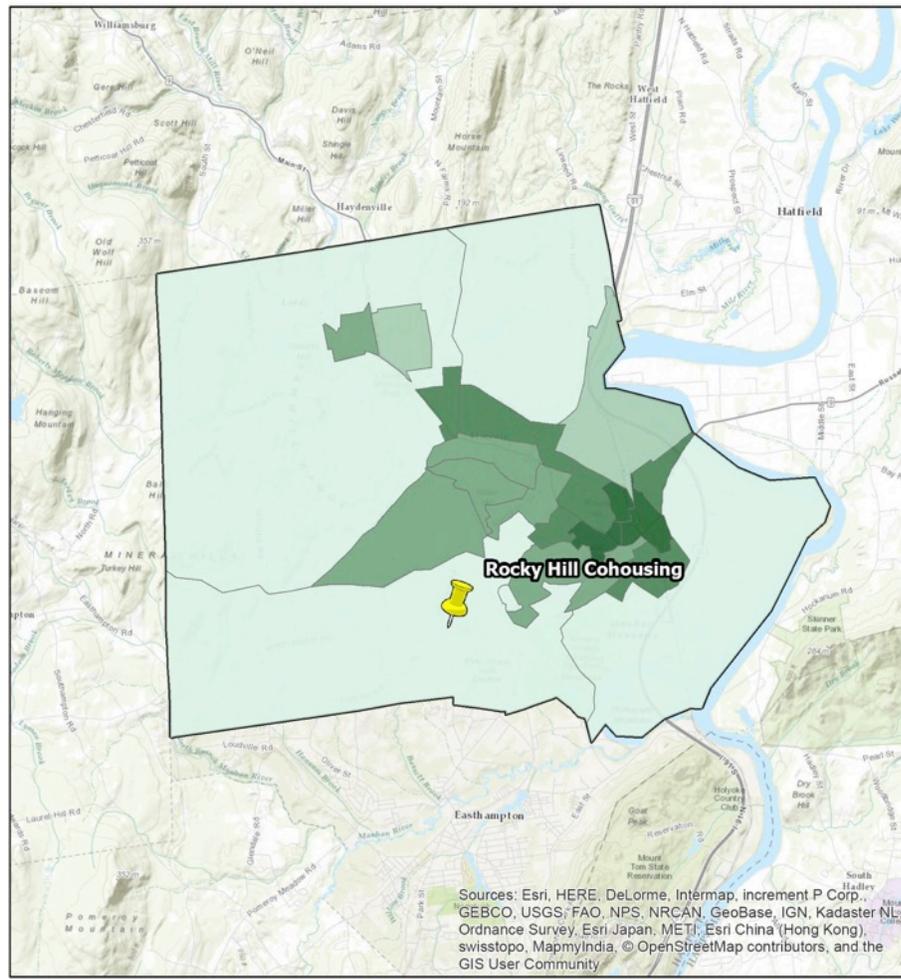


Figure 10. Town of Amherst, MA population density according to U.S. Census 2000 (Town of Amherst, MA, 2006).

City of Northampton Population Density - U.S. Census 2000



Legend (people/sq. mile)



Figure 11. City of Northampton, MA population density according to U.S. Census 2000 (Marques Jordao, 2016a).

According to MassGIS.gov 2005 land use data, Pioneer Valley Cohousing and Pine Street Cohousing are included in the “urban public/institutional” category (Figures 12 and 13). This category is described as “lands comprising schools, churches, colleges, hospitals, museums, prisons, town halls or court houses, police and fire stations, including parking lots, dormitories, and university housing (...), may include public open green spaces like town commons” (MassGIS Data - Land Use 2005, 2009). Therefore, both Pioneer Valley Cohousing and Pine Street Cohousing are not correctly classified under residential land use categories, which might lead to erroneous analysis via MassGIS.gov 2005 land use data.

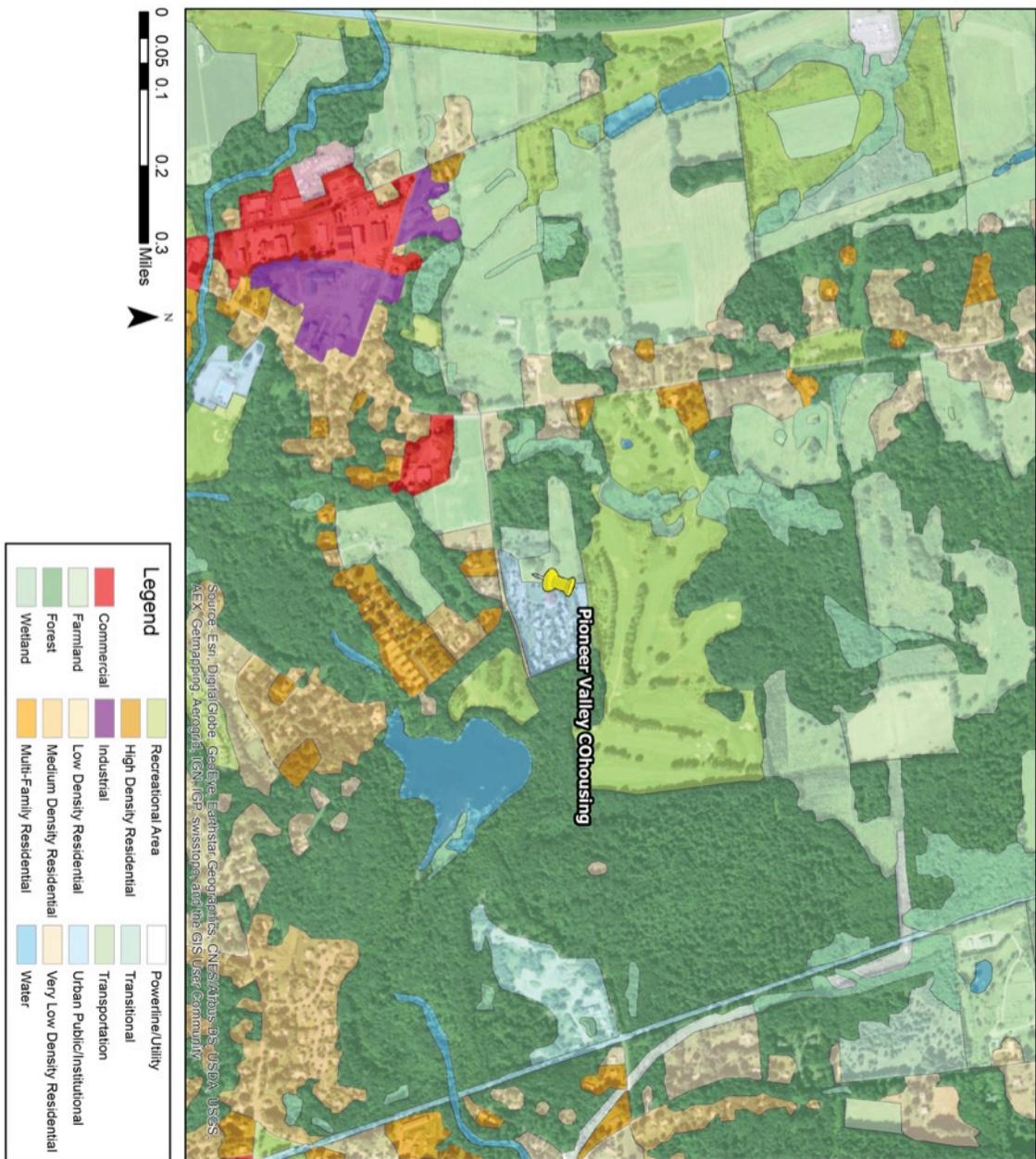


Figure 12. Land use around Pioneer Valley Cohousing (Marques Jordao, 2016b).

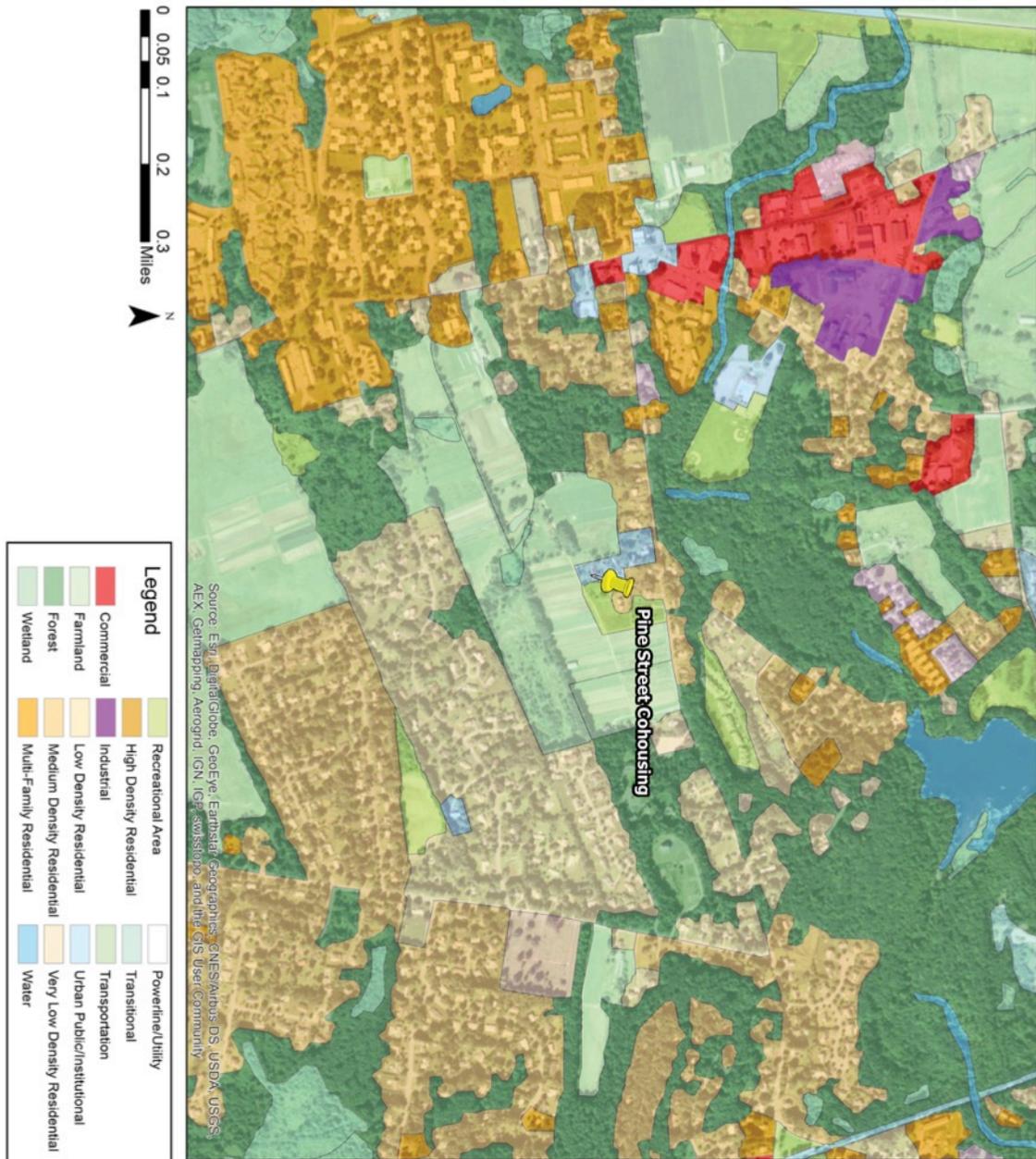


Figure 13. Land use around Pine Street Cohousing (Marques Jordao, 2016c).

Rocky Hill Cohousing is included in the industrial category (Figure 14), which is described as “Light and heavy industry, including buildings, equipment and parking areas” (MassGIS Data - Land Use 2005, 2009). None of these two categories, however, accurately describe the land use of clustered multi-family homes with

common open spaces and recreational areas, as some cities call “clustered residential development.” The City of Northampton, MA (2015b) describes clustered residential developments as having a “variety of dwelling types integrated with each other and with a significant area of common open space.”

The category in the MassGIS land use classification system that most resembles cohousing is “multi-family residential” which is described as “duplexes (usually with two front doors, two entrance pathways, and sometimes two driveways), apartment buildings, condominium complexes, including buildings and maintained lawns” (MassGIS Data - Land Use 2005, 2009). However, according to Boyer (2015) cohousing is not “exactly single-family housing nor exactly multi-family housing.” This inaccuracy is probably due to the fact that the land use data available through MassGIS was determined using a semi-automated system through ortho-imagery, with minimum mapping units of one acre (MassGIS Data - Land Use 2005, 2009). According to the article, the category of multi-family homes was “difficult to assess via photo-interpretation,” and the MMU was increased to $\frac{1}{4}$ acre but only in urban areas (MassGIS Data - Land Use 2005, 2009). Therefore, misleading land use classification is found for the three case-studies, which may cause communities to go unnoticed under certain land use spatial analysis by city officials, academics, and researchers. As cohousing and other high-density intentional communities spread around the country, it is important for state and town spatial data and mapping databases to create a category that encompasses such communities (high-density multi-family with shared outdoor spaces). Until then, these communities should be classified under the most similar category

available (i.e. multi-family residential), which could be done by cross-referencing with existing directories such as those available through the Cohousing Association of the United States and the Fellowship for Intentional Community.

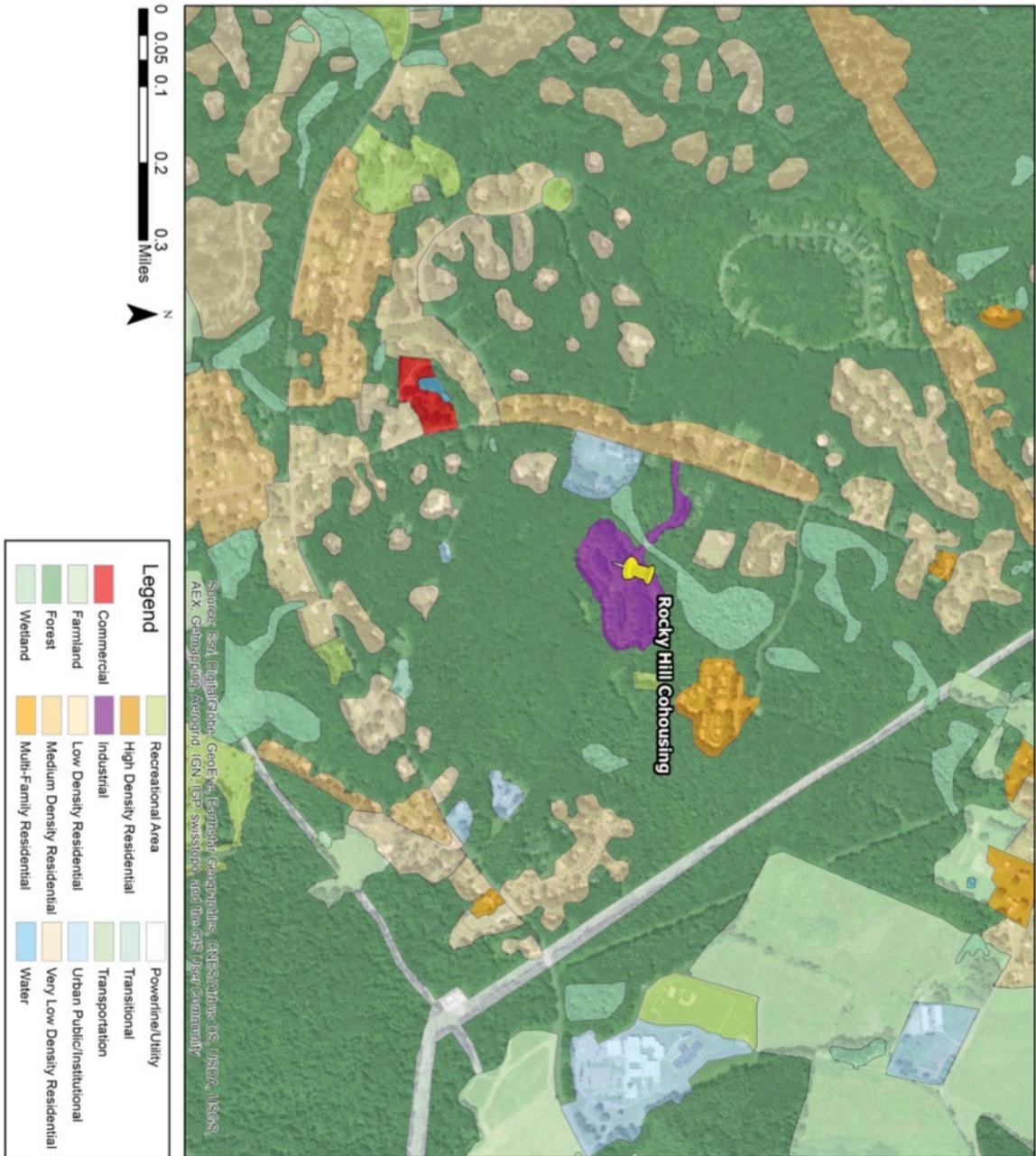


Figure 14. Land use around Rocky Hill Cohousing (Marques Jordao, 2016d)

Analyzing the towns' zoning maps provided more accurate results (Figures 15-17). According to the Town of Amherst (2016a), Pioneer Valley Cohousing is within Residential Neighborhood District (R-N) with a Planned Unit Residential Development (PURD) District overlay (Figure 15). R-N districts usually encompass medium-density residential neighborhoods that can also be adjacent to higher density residential districts (Town of Amherst, MA, 2014). The PURD District's goals is to provide a mix of housing types and densities to allow "creative development, protection of the natural resources, and compatibility with surrounding areas," which would not be allowed by the underlying zoning (Town of Amherst, MA, 2014). This overlay of zoning districts provides successful conditions for the development of cohousing. However, as noted by Boyer (2015) zoning can provide many obstacles for the development of high-density intentional communities such as cohousing. According to the author, this is because cohousing "tend to cluster homes in ways that defy density maximums, setback requirements, and parking minimums" (Boyer, 2015). Therefore, existing cohousing-friendly zoning is, very often, a bottom-up approach by cohousing communities working with city planners to create suitable zoning categories (ibid). As seen in Amherst, MA, these categories are usually called "Planned Unit Developments" (PUDs) or "Planned Residential Developments" (PURDs) (Boyer, 2015; Town of Amherst, 2014). In addition to zoning, subdivision regulations also pose a challenge to the establishment of cohousing communities (Boyer, 2015). This is because these regulations impose certain criteria for the development of new infrastructure such as street widths, the location of trees and plantings, streetlights and drainage. Any new development

trying to establish shared resources (i.e. internal narrow paths for pedestrians, commons, combined septic and drainage systems) will encounter difficulties due to subdivision regulations (ibid). Therefore, most of the time, forming groups or developers interested in building cohousing will have to find legal ways to change zoning and subdivision regulations. One way to find a legal justification is by examining the town's Comprehensive Plans or General Plans. These are studies that try to delineate a course of action for how towns should develop in the upcoming years, and usually done by having a certain amount of public input and participation (ibid). The town of Amherst, for example, has a comprehensive plan on village boundaries and open space preservation strategies (Amherst Comprehensive Planning Committee, 2004).

Pine Street Cohousing is included within the R-N district (Figure 16), but it was not without resistance from the town during its' conception in the 1990's (Coldham, personal communication, 2015; Town of Amherst, MA, 2014). According to the founder and architect of Pine Street Cohousing, Bruce Coldham, the development of Pine Street Cohousing influenced the creation of cohousing-friendly bylaws in Amherst, such as the Open Space Community Development (Coldham, personal communication, 2015). According to the Town of Amherst's Planning Board & Planning Department 2002 Report, the Open Space Community Development bylaw was created to "allow for flexible development standards in exchange for open space protection and affordable housing."

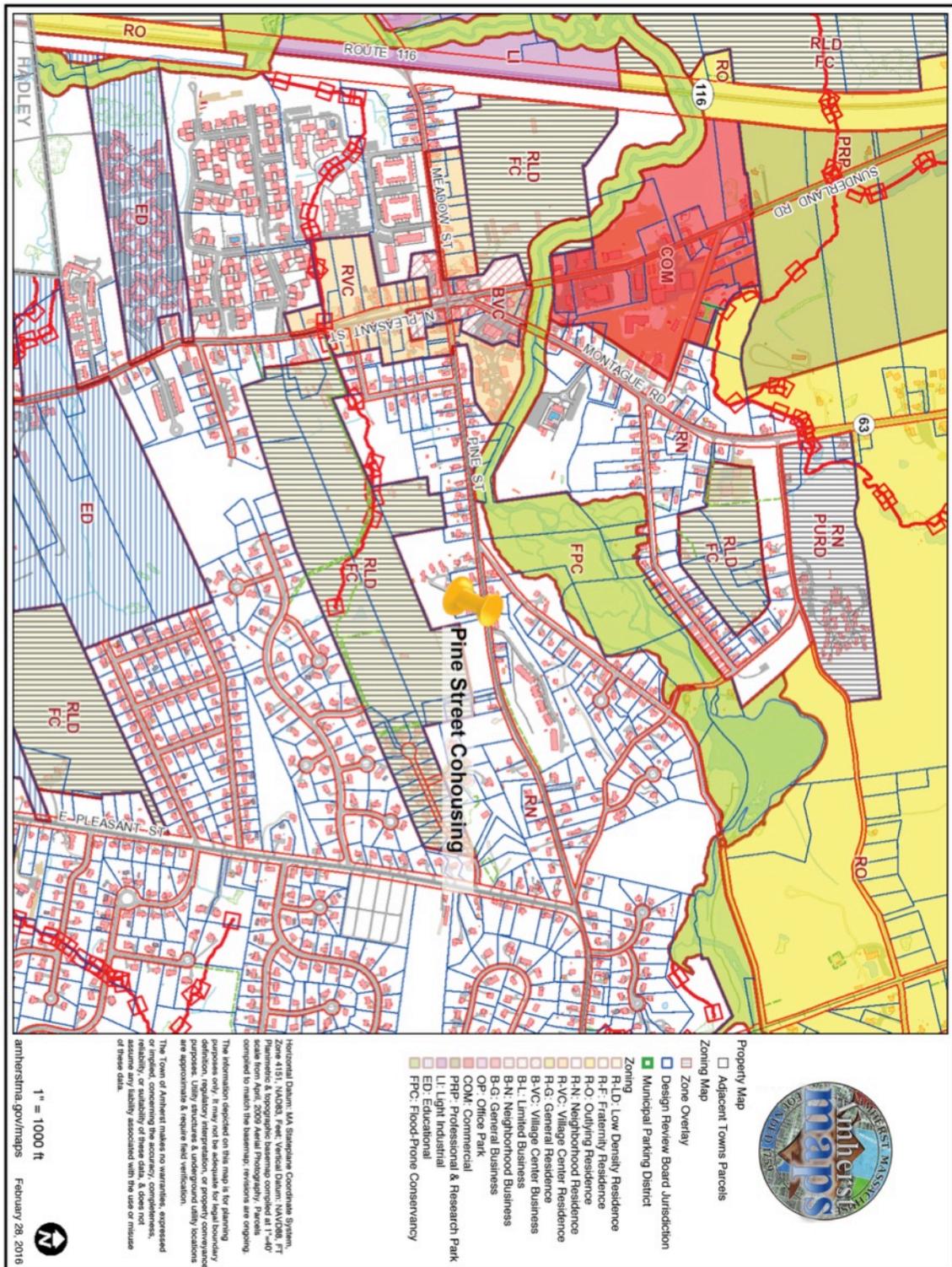


Figure 16. Amherst zoning map including Pine Street Cohousing (Town of Amherst, MA, 2016b).

The Rocky Hill Cohousing community is included within the Suburban Residential District “SR” (Figure 17) within the City of Northampton, MA (City of Northampton, 2013). The SR district is described as “ lower density residential and agricultural land with cluster development encouraged.” However, some key cohousing elements such as shared driveways, combined parking and the parking requirement reduction will still need a site plan approval by the city. Northampton also specifies development layout standards for cluster development such as a project lot of 4-acre minimum, with at least 75% being open space (City of Northampton, MA, 2015a). There are setbacks specified for the boundary of the project, but not for internal lots – which assures a person-scale community design with close dwelling units and pedestrian paths. The city also recognizes goals of rural high-density communities such as the preservation of open space, and the potential to use landscape amenities for these communities (City of Northampton, 2015b).

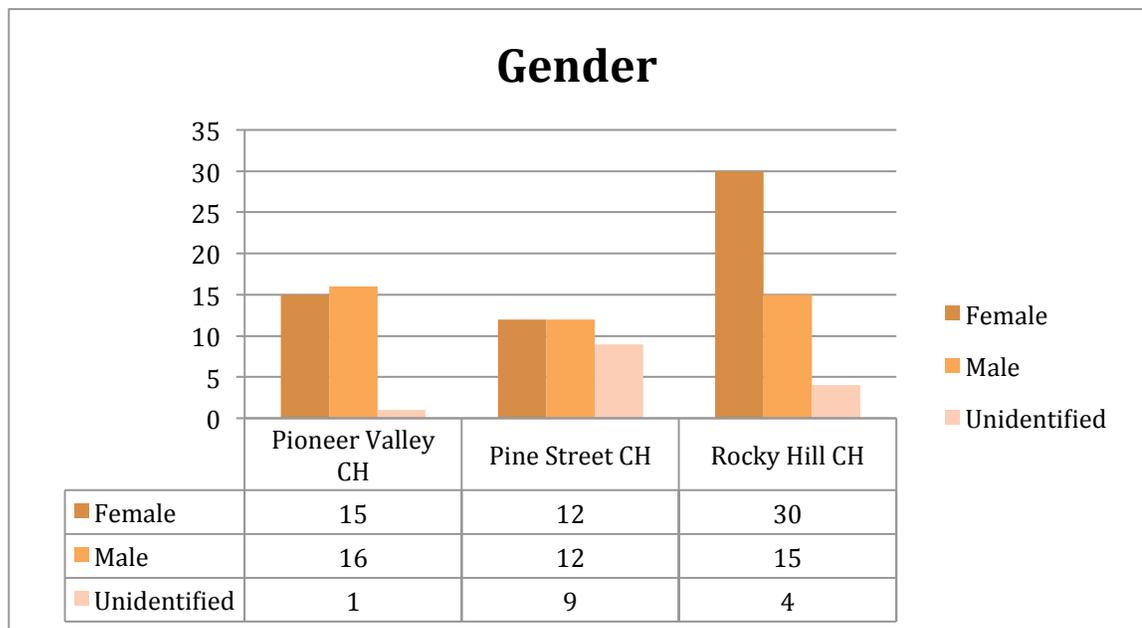
The Rocky Hill Cohousing community worked directly with a private consultant and project manager to move through the approval and permitting phases (Rocky Hill Cohousing, 2015). Additionally, in order to get the project approved, community presence on conservation and planning board meetings were a deciding factor (Entin, personal communication, 2016). Unlike most cohousing communities, Rocky Hill did not encounter significant neighborhood opposition to its construction, probably due to the fact that there is a well-established cohousing community in a neighboring lot, and as seen on Figure 14, there is significant vegetation buffer in between the site and surrounding neighbors (ibid).

As seen from this paper's case-studies, the development of cohousing can be achieved in different ways within the same town or region. Boyer (2015) recommends that groups trying to establish cohousing 1) communicate with planning staff early on in the process, 2) review the town's or jurisdiction's comprehensive plan with the intent to find elements that resemble the communities' goals, and 3) advocate that cohousing and other clustered intentional communities be directly cited in the town's comprehensive plan and other official documents. Other steps to ensure a smooth permitting process for a new cohousing community is to partner with private consultants and facilitators (See section 6.1.2), as well as ensure that a group of future cohousing residents be present at town board, planning and zoning meetings in order to participate.

4.3 Site Observations

4.3.1 Gender and Age

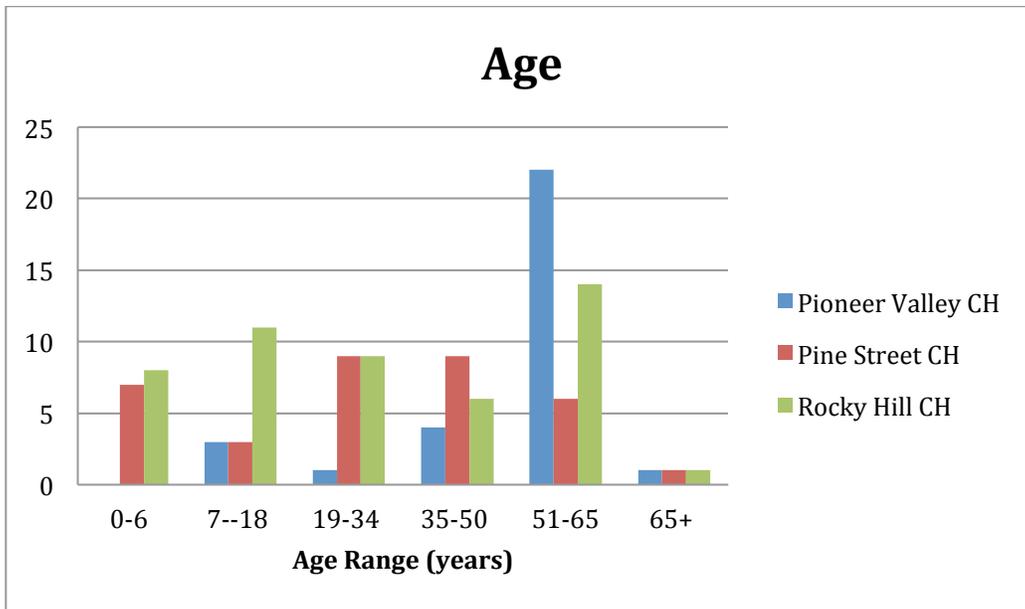
A total of 114 people were observed during the six site observations performed during Fall 2015 (Table 1). The largest number of people performing outdoor activities was observed at Rocky Hill (49), followed by Pine Street (33) and then Pioneer Valley Cohousing (32). About 38% of people observed were male, 50% were female and 12% were unidentified (Figure 18). “Unidentified” means the gender of the subject was not obvious to the observer; these were usually children or teenagers. It is important to note that this observation method is based on perceived gender (by the observer) rather than identified by the subject (gender identity), so a margin of error needs to be considered.



*Note limited sample size

Figure 18. People observed during on-site studies and gender distribution

The age distribution of the people observed in the study can be seen on Figure 19. Most subjects were perceived to be in the 51-65 years age range.



*Note limited sample size

Figure 19. Age distribution of observed people on all cohousing communities.

Similar age results were found on the Survey of Cohousing Communities 2011, which state that 75% of communities have children in the 0-3 year age category, and all of the communities polled contain children within the 4-18 year age group (Margolis & Entin, 2011). The authors also note that there is a scarcity of adults ages 19-35 years old (76% of communities reported 10 or fewer adults in this category). Most cohousing residents are within the 36-64 year age category, with residents ages 65-80 years old also present. Few communities report residents over 80 years old (Margolis & Entin, 2011)

This reiterates other findings from the Cohousing Research Network 2012 National Survey of Cohousing Residents (Figure 20), that most cohousing residents in the U.S. are within the 40+ age category (Cohousing Research Network, 2015). The survey polled 1,000 cohousing households around the country, having an

answer rate of 43% (528 people) from 116 communities spread among 23 states (Cohousing Research Network, 2015).

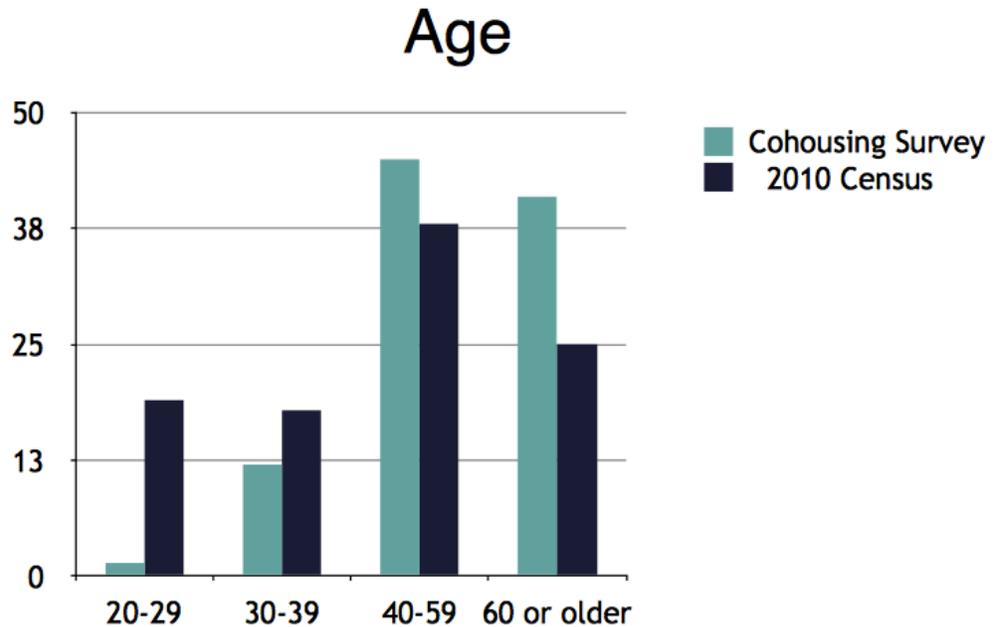
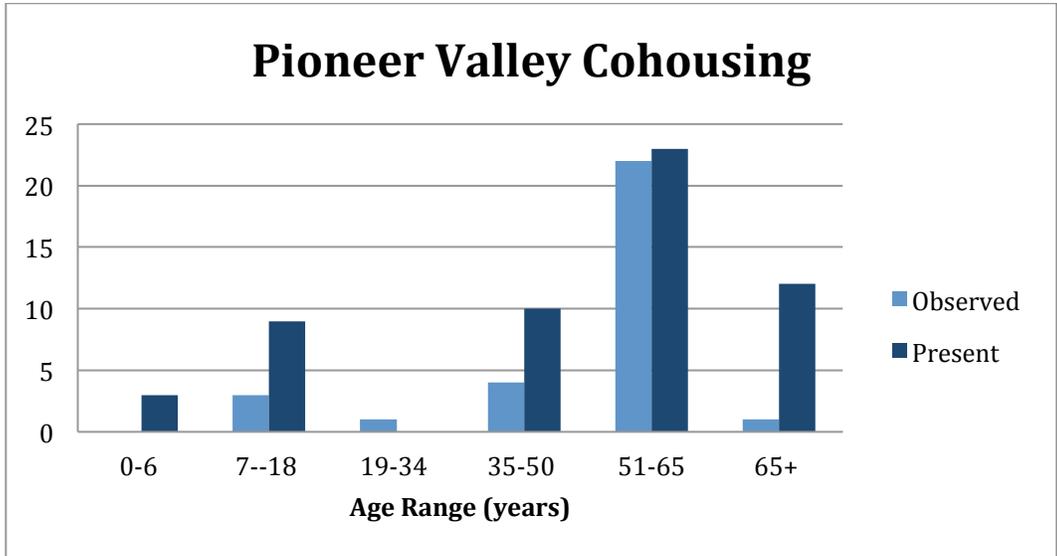


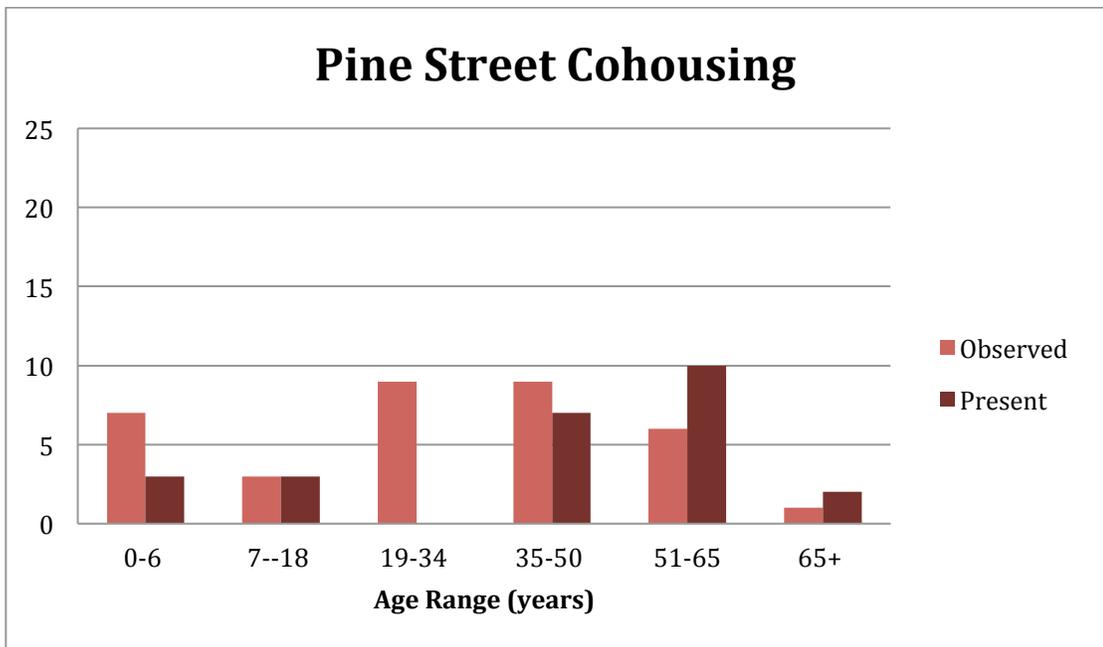
Figure 20. Age distribution of cohousing residents across the U.S. according to the 2012 National Survey of Cohousing Residents (Cohousing Research Network, 2015)

The age distribution of the each cohousing community is plotted next to the observed data on Figures 21-23 for comparison. In some cases, the number of people observed is higher than the number of residents in the same age range. This disparity can occur due to a number of reasons: 1) the same person may have been observed on different days; 2) outside visitors may have come to the community; 3) there could have been a misjudgment of age range by the observer.



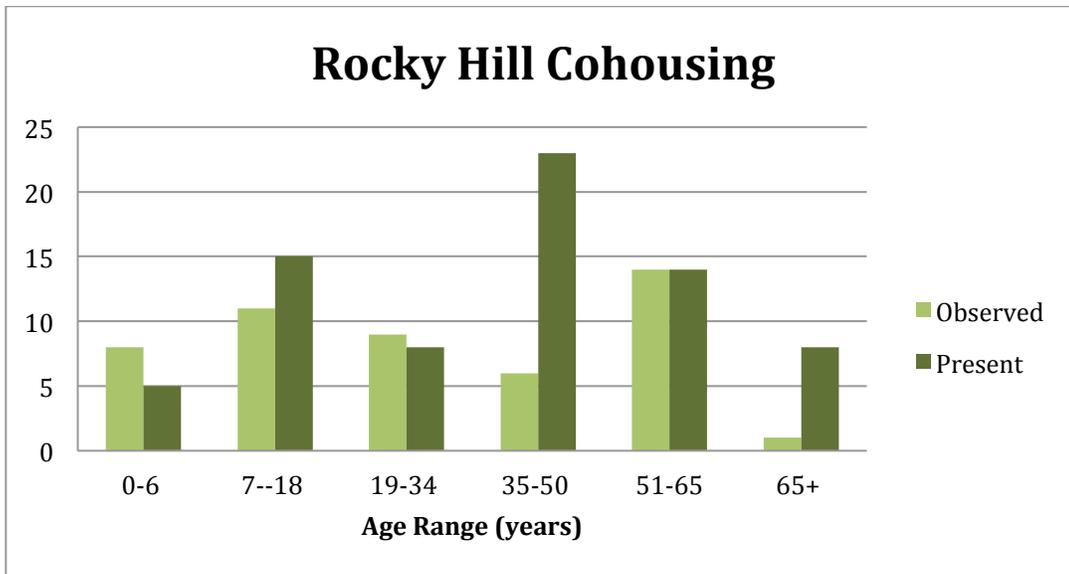
*Note limited sample size

Figure 21. Age distribution of residents and other people observed at Pioneer Valley Cohousing.



*Note limited sample size

Figure 22. Age distribution of residents and other people observed at Pine Street Cohousing.



*Note limited sample size

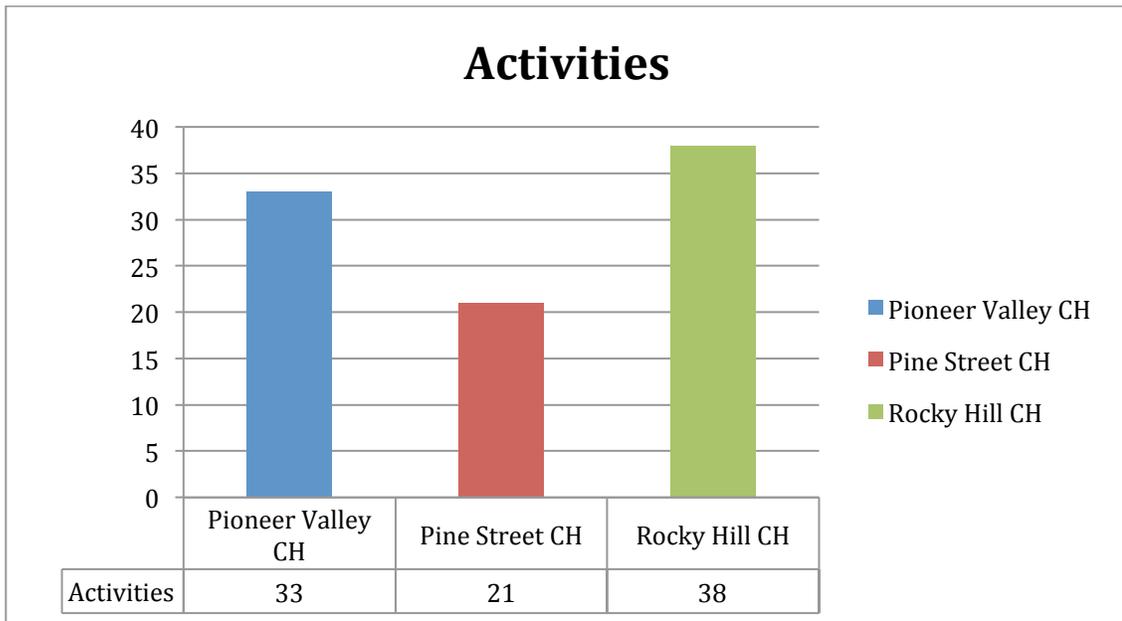
Figure 23. Age distribution of residents and other people observed at Rocky Hill Cohousing.

4.3.2 Activities

A total of 91 activities were observed during the site observations (Figure 24). The total number of activities is smaller than the total number of people observed because subjects were recorded in groups when performing activities together (Table 1). For instance, if two children were seen playing on the path, the observer recorded the number of people, their perceived gender and age, but only accounted for one activity (i.e. “playing”). This was done in order not to skew the data to show more group activities happening due to the number of people involved, instead of distinct times that the activity was observed. However, the same person could also be recorded to be performing more than one activity (i.e. walking on path and talking to neighbor).

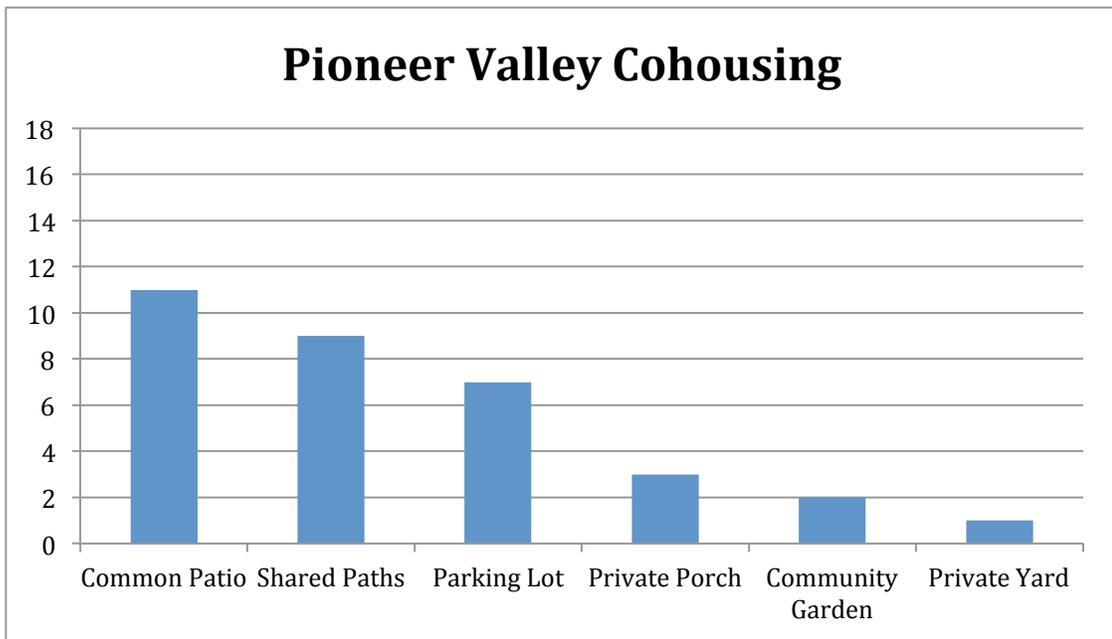
The areas where activities happened in each community are presented on Figures 25-27. At Pioneer Valley Cohousing, activities were observed in six

distinctive areas: 1) the common patio; 2) shared paths; 3) parking lots; 4) private porches; 5) community gardens; and 6) private yards (Figure 25). At Pine Street Cohousing, activities occurred in six areas: 1) the central community area on the shared path; 2) front driveway; 3) play area; 4) orchard; 5) the volley net; 6) private yards; 7) picnic area; and 8) open space – field (Figure 26). Finally, at Rocky Hill Cohousing, activities were observed in six places: 1) shared paths; 2) common patio; 3) bike path; 4) play area; 5) parking lot; and 6) private porches (Figure 27).



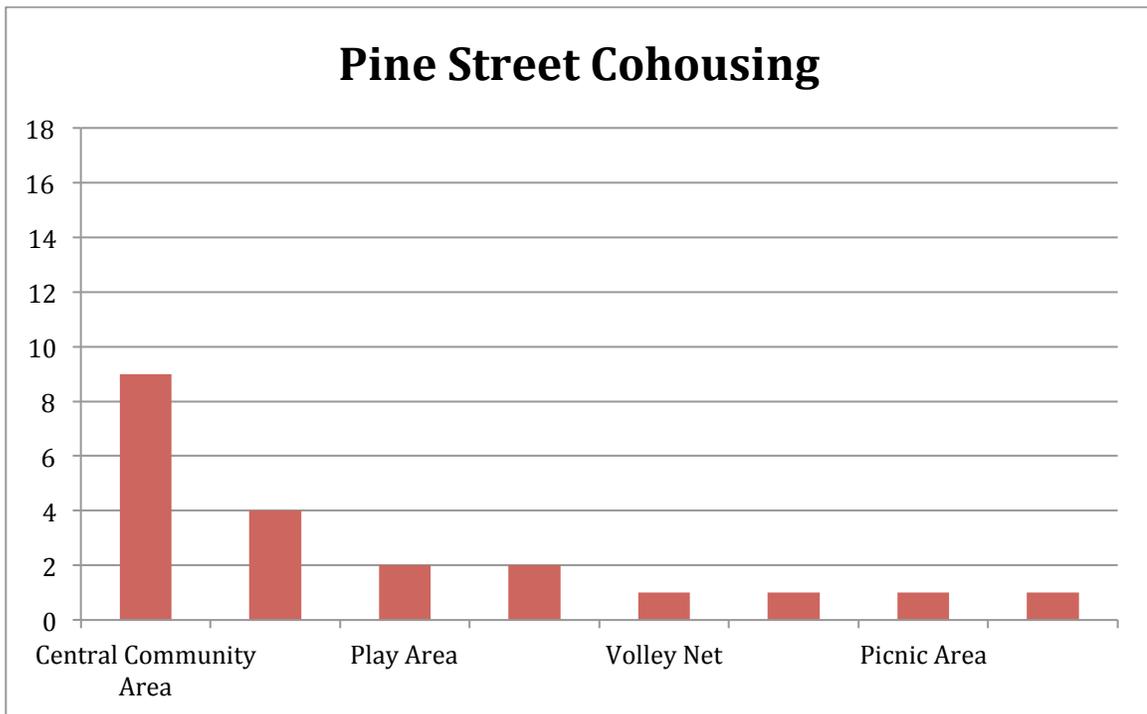
*Note limited sample size

Figure 24. Number of activities registered in each community



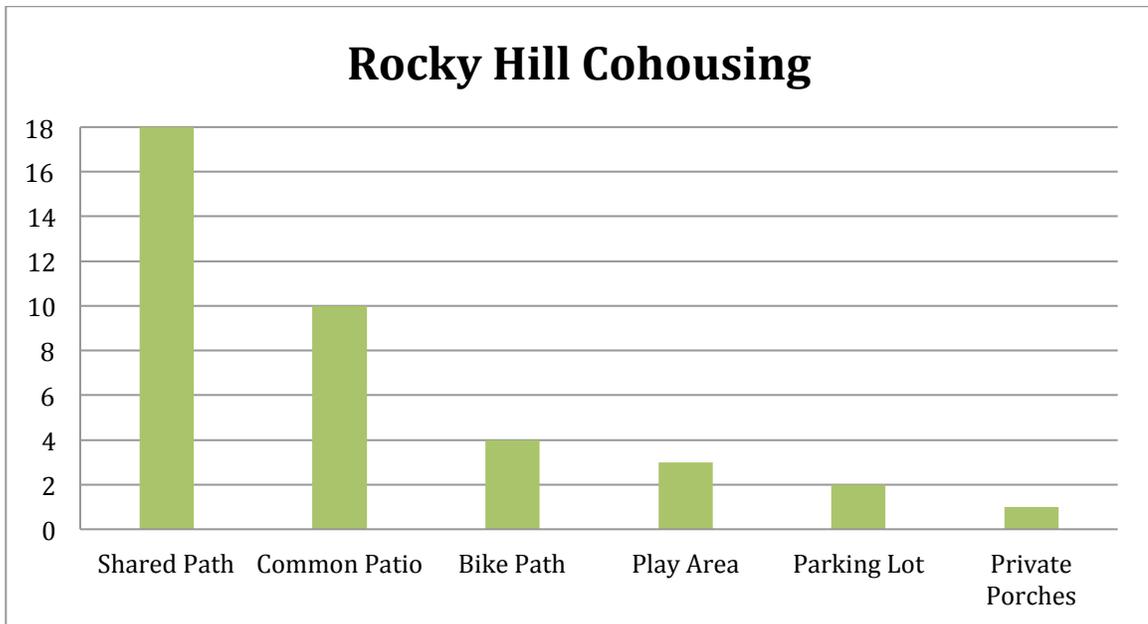
*Note limited sample size

Figure 25. Pioneer Valley Cohousing observed activities by place



*Note limited sample size

Figure 26. Pine Street Cohousing observed activities by place



*Note limited sample size

Figure 27. Rocky Hill Cohousing observed activities by place

For each community, activities observed in the outdoors areas with higher activity frequency are displayed in figures 28-32. At Pioneer Valley Cohousing, most activities occurred on the shared paths. Most people were observed walking and riding bicycles. Other activities such as talking to neighbors, running and jogging were also observed (Figure 28). At the common patio, half of the activities were related to accessing the common house. Conversations between neighbors, as well as residents sitting on the porch, benches, and movable chairs were registered (Figure 29). There were no activities recorded inside the area of the inner circle of houses. This is probably due to the fact that the backs of the houses are close together there, so it is perceived as an extension of units' backyards instead of a community area.

As described in the spatial analysis section, Pine Street Cohousing does not possess a common house, however there is a common tool shed, community garden

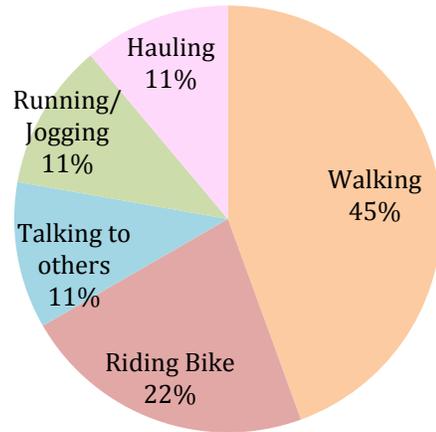
and lawn located centrally in the community. I considered this area to be the “central community area,” which would be the equivalent of the areas in front of common house at Pioneer Valley Cohousing and Rocky Hill Cohousing (Figure 34). In the central community area, most activities were related to children playing in the area and attendant adult supervision (Figure 30). Conversations between residents emerged as a result, and people were also observed accessing the common tool shed. Interestingly, people were not observed on the lawn portion of the central community area, only in the paved surfaces. This might be due to the fact that the central portion of the common lawn is primarily dedicated to the community gardens – an area of specific activity. Additionally, there is no seating infrastructure on or near the main lawn, as observed in Pioneer Valley Cohousing (i.e. sitting wall and movable furniture). Therefore, placing the community gardens on the edge of the community, and providing seating and tables might increase the use of such a space, at least during warm months. The second area with highest activity frequency at the Pine Street Cohousing was the front driveway, where children were observed playing soccer and riding bicycles together with parent supervision. Although the driveway and paved paths were used by residents for talking, sitting and playing, safety (and therefore use) would likely increase if vehicular and pedestrian paths were separated as observed at Pioneer Valley and Rocky Hill Cohousing communities.

Finally, at Rocky Hill Cohousing, most activities also occurred on the shared paths around the community (Figure 35). Most people were observed walking on paths and/or having conversations with neighbors. People were also observed

walking dogs, running/jogging and playing in such areas (Figure 31). At Rocky Hill Cohousing, there are no facing houses. Houses across from each other are separated by a wooded patch, with tall trees and play structures. During the participatory process, each community chooses the level of privacy they would like to achieve in their communities. This includes placing a buffer between front facing houses. However, this may decrease the amount of spontaneous interactions between neighbors. In the common patio most activities were related to children playing in the pavement and nearby play structure, as well as adult supervision and conversation between neighbors (Figure 32).

These observations reinforce McCamant & Durrett's (2011) statement that shared paths, or pedestrian streets as called by the authors, are more than circulation features – they are places where significant community interaction occurs. Therefore, they should be carefully designed and constructed (see design recommendations on Section 6.1.2). Additionally, the common patio proved to be a lively area where neighbors meet and children play on a regular basis. Ensuring infrastructure such as chairs, tables, play elements and structures are essential for encouraging spontaneous activities (see design recommendations on Section 6.1.3).

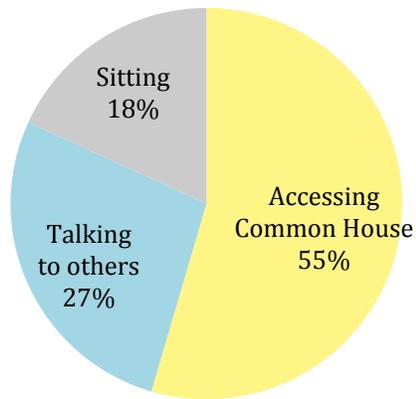
Pioneer Valley Cohousing: Shared Path



*Note limited sample size

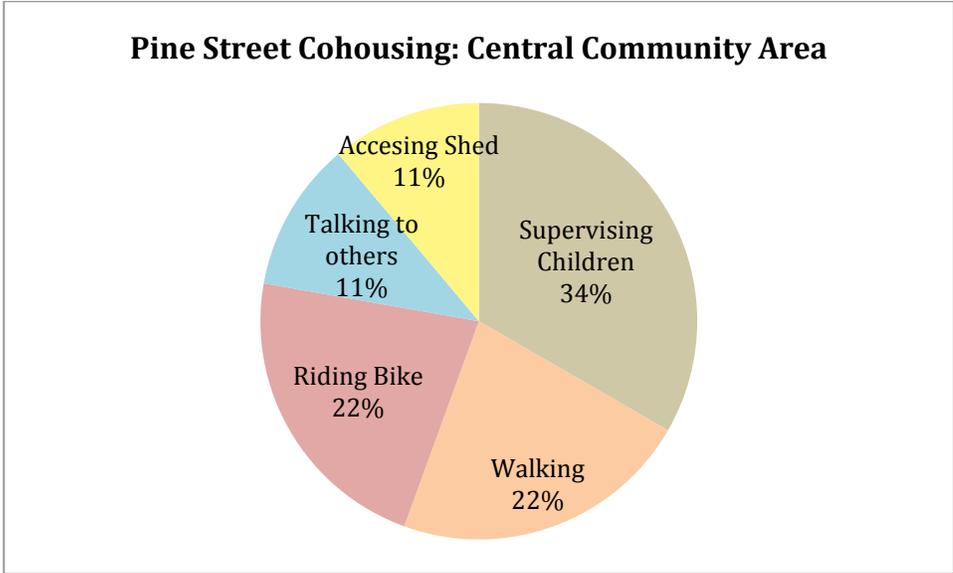
Figure 28. Activities observed on paved paths at the Pioneer Valley Cohousing

Pioneer Valley Cohousing: Common Patio



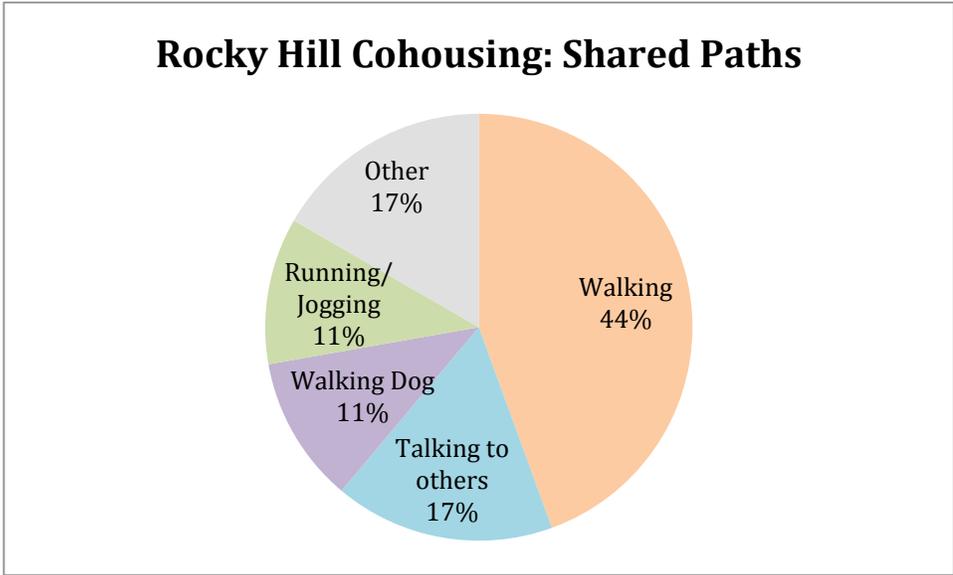
*Note limited sample size

Figure 29. Activities observed in front of the common house at the Pioneer Valley Cohousing



*Note limited sample size

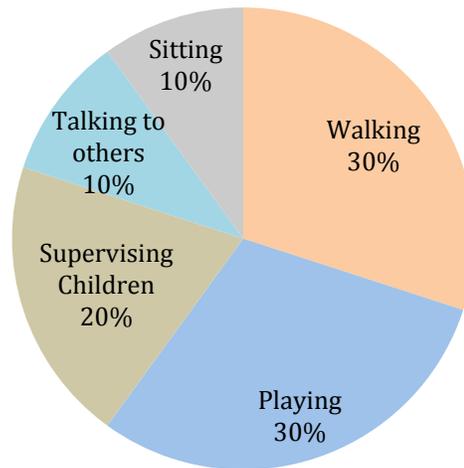
Figure 30. Activities observed in the central community area at the Pine Street Cohousing



*Note limited sample size

Figure 31. Activities observed along the paved paths of Rocky Hill Cohousing

Rocky Hill Cohousing: Common Patio



*Note limited sample size

Figure 32. Activities observed in front of the common house at Rocky Hill Cohousing



Figure 33. Pioneer Valley Cohousing Resident gardening at the community garden [Personal photograph taken in Amherst, MA] (2016).



Figure 34. Children riding bicycles and adults supervising in the central community area of Pine Street Cohousing [Personal photograph taken in Amherst, MA] (2016).



Figure 35. Children playing on the paved path at Rocky Hill Cohousing [Personal photograph taken in Northampton, MA] (2016).

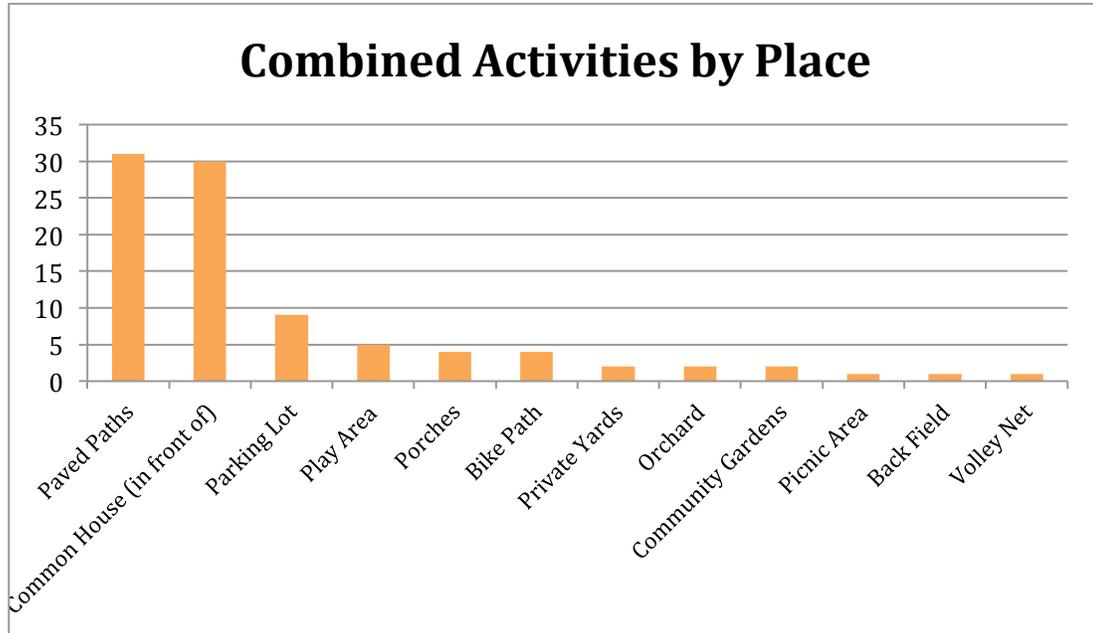


Figure 36. People running on the bike path of the Rocky Hill Cohousing [Personal photograph taken in Northampton, MA] (2016)

When combining the results by place of activity, the areas that had higher number of activities were: 1) shared paths; 2) common patio; 3) parking lots; 4) play areas; 5) private porches; 6) bicycle paths (Figure 36); 7) private yards; 8) orchard; 9) community gardens; 10) picnic areas; 11) open space – fields; and 12) volley net (Figure 37).

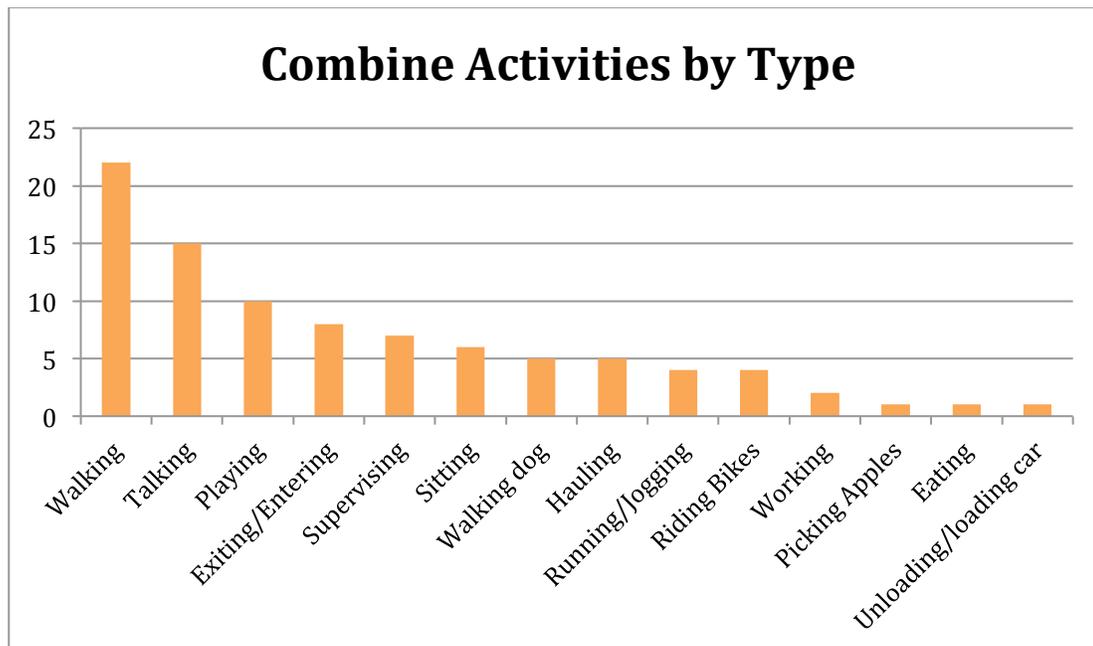
Activities of all three case studies were analyzed together, and yielded the following results: 1) walking; 2) talking to others; 3) playing; 4) accessing the common house; 5) supervising children; 6) sitting on benches, outdoor furniture or on paths; 7) walking a dog; 8) hauling items from car to units or the common house and vice-versa; 9) running or jogging; 10) riding bicycles; 11) working on personal

projects; 12) picking apples, eating together and unloading or loading a car (Figure 38). A summary of the results can be seen on Table 2.



***Note limited sample size**

Figure 37. Combined frequencies by place of activity of the three case studies.



***Note limited sample size**

Figure 38. Combined frequencies by activity type of the three case studies

Table 2. Summary of field observation results

Case-Study	Location	Parcel Size (acres)	Number of Households	Gross Density (households/acre)	Net Density (households/acre)	Open Space (acres)	Outdoor Spaces	Activity Frequency (n)	People Observed (n)	Highest Activity Frequency (Place)	Highest Activity Frequency (Type)
Pioneer Valley Cohousing	Amherst, MA	22	32	0.7	5	15.4	<ul style="list-style-type: none"> • Shared Paths (Pedestrian) • Central Lawn • Community Gardens • Chicken Coop • Open Space - Field • Open Space - Wooded • Play Structures • Private Yards and Porches • Shared Paths (Pedestrian + Vehicular Combined) • Central Lawn • Community Gardens • Open Space - Field • Open Space - Wooded • Play Structures • Swale (Ice Skating Pond) • Orchard • Volley Net • Private Yards and Porches 	33	32	<ul style="list-style-type: none"> 1. Common Patio 2. Shared Paths 3. Parking Lot 4. Private Porches 5. Community Garden 6. Private Yards 	<ul style="list-style-type: none"> 1. Talking to Others 2. Accessing Common House 3. Walking 4. Sitting 5. Hauling 6. Riding Bikes
Pine Street Cohousing	Amherst, MA	7	11	0.6	3	4.8	<ul style="list-style-type: none"> • Shared Paths (Pedestrian + Vehicular Combined) • Central Lawn • Community Gardens • Open Space - Field • Open Space - Wooded • Play Structures • Swale (Ice Skating Pond) • Orchard • Volley Net • Private Yards and Porches 	21	33	<ul style="list-style-type: none"> 1. Central Community Area (Shared Path) 2. Front Driveway 3. Play Structure 4. Orchard 5. Volley Net 6. Private Yards 7. Picnic Area 8. Open Space - Field 	<ul style="list-style-type: none"> 1. Playing 2. Supervising Children 3. Walking 4. Walking Dog 5. Talking 6. Riding Bikes
Rocky Hill Cohousing	Northampton, MA	28	27	1	4	19.6	<ul style="list-style-type: none"> • Shared Paths (Pedestrian) • Central Patio • Central Wooded Area • Community Gardens • Chicken Coop • Open Space - Field • Open Space - Wooded • Wooded Trails • Play Structures • Bike Path • Sledding Hill • Private Yards and Porches 	37	49	<ul style="list-style-type: none"> 1. Shared Paths 2. Common Patio 3. Bike Path 4. Play Structures 5. Parking Lots 6. Private Porches 	<ul style="list-style-type: none"> 1. Walking 2. Talking to Others 3. Playing 4. Sitting 5. Running/Jogging 6. Hauling 7. Walking Dog 8. Supervising Children

*Note limited sample size

After the analysis of the results, spaces were placed into three categories: 1) multi-functional community spaces; 2) specific-use community spaces and 3) semi-private spaces (Figure 39). These categories reflect different levels of activity-specificity and frequency as described below.

Multi-functional community spaces were defined as areas where many types of activities occurred, despite the main use of the space or in the case of spaces that do not have a specific use. For example, shared paths are mainly used for circulation, however residents were observed talking, playing and exercising in such areas. Other spaces that fall into this category are those that do not have one main use, such as open fields or wooded areas.

Specific-use spaces were defined as areas that have a high frequency of their main use. For example, most people in community gardens were observed performing activities related to planting, weeding and harvesting. Specific recreational sports areas, such as volleyball nets, tend to allow for one type of use.

Semi-private spaces were defined as areas out of the shared realm, such as paths and common patio, but not yet within the private dwelling unit. Outdoor semi-private spaces were usually comprised of porches and yards.

Multi-functional Community Spaces	Specific-use Community Spaces	Semi-private Spaces
<ul style="list-style-type: none"> ▪ Paved Paths ▪ Common House Patio ▪ Central Lawn ▪ Play Areas ▪ Bike Path ▪ Open Fields 	<ul style="list-style-type: none"> ▪ Community Gardens ▪ Orchard ▪ Sport Field/Area ▪ Picnic Area ▪ Parking Lots 	<ul style="list-style-type: none"> ▪ Porches ▪ Yards

Figure 39. Outdoor spaces classification and examples

4.4 Other Observations

In each community, I was welcomed by a long-term resident that walked me through the grounds and shared further information on the establishment, socialization and use of outdoor spaces on the cohousing. All three communities host workdays, in which residents sign up for tasks that help maintain the community both indoors (such as within the common house and other associated buildings) and outdoors (such as raking, mowing lawns, cleaning, etc.). Pioneer Valley Cohousing holds five workdays per year, Pine Street Cohousing holds two workdays per year and Rocky Hill Cohousing holds four workdays per year.

At Pioneer Valley Cohousing, the patio in front of common house contains movable furniture, which has been noted as a successful strategy to attract residents to use the space. Additionally, during the summer of 2015, the community made available movable ping pong tables that were displayed in the patio during weather-permitting afternoons. This strategy proved to be very successful in promoting interaction in between residents, who created a tournament and other games utilizing the ping-pong tables. Usually, no community activities occur in the central lawn, on the back of the houses located on the inside of the loop. Residents believe that this is due to the fact that those units possess smaller private outdoor yards, so the space is considered an extension of individual properties (Porcino, personal communication, 2015). Other outdoor activities and celebrations (Figures 40 and 41) are listed on their website, such as a candle lit gathering ritual, storytelling around the fire, spring maple sugaring, a May Day garden blessing, a Halloween parade and party, winter solstice bonfire and dancing, New Years' Eve games and

midnight sledding (Pioneer Valley Cohousing, n.d.).



Figure 40. Pioneer Valley Cohousing residents gathering at the community green space (“Untitled image of residents gathering outdoors,” n.d.)



Figure 41. Children playing in the community green space at Pioneer Valley Cohousing (“Untitled image of children playing outdoors,” n.d.)

Pine Street Cohousing uses their rear field to hold sporadic events such as weddings and receptions. They also possess a patch of wooded area on the south of the property where a tree house is located. Community members clean out the wooded area and participate in a “burn day,” where residents gather for a bonfire experience. In years with plentiful apple harvests, the community gets together for apple pressings at the orchard. Other activities reported in their website include outdoor musical performances (Figure 42) and ice-skating on the central lawn during the winter (Figure 43) (The Pine Street Cohousing Community., n.d.).



Figure 42. Outdoor music performance and gathering at Pine Street Cohousing (“Concert at Barn”, 2014).



Figure 43. Ice-skating on the frozen pond at Pine Street Cohousing (“Untitled image of child skiing on frozen pond,” 2014).

Rocky Hill Cohousing holds community meals on the patio in front of the common house at least three times per year (Memorial Day, 4th July and Labor Day). During the summers they host “Camp Rocky Hill,” a program for children in the community to explore the outdoors and educational activities (Figures 44 – 46).



Figure 44. Children doing activities on the patio during “Camp Rocky Hill” at Rocky Hill Cohousing (Entin, n.d.a).



Figure 45. Children playing on the play area during “Camp Rocky Hill” at Rocky Hill Cohousing (Entin, n.d.b).



Figure 46. Children playing near the community garden during "Camp Rocky Hill" at Rocky Hill Cohousing (Entin, n.d.c).

CHAPTER 5

RECOMMENDATIONS

5.1 General Advice on Creating Cohousing

5.1.1. Planning

Recommendations in this section were outlined after analyzing land use and zoning for the three case-study cases in the present study, as well as by referencing the literature in section 4.1

During the initial stages of cohousing planning, interested individuals should:

1. Check to see if there are any cohousing communities in the area, especially in a nearby town or surrounding jurisdictions. The Cohousing Association of the United States (www.cohousing.org/directory) and the Fellowship for Intentional Communities (www.ic.com/directory) have extensive data on cohousing communities across the U.S. Searching for communities on land use maps can be deceiving, since some databases do not have a category that accurately describes cohousing. In this study, all cohousing case-study cases were placed in categories that incorrectly describe them, such as urban/public institutional and industrial (as discussed in section 4.1).
2. If there are established or built cohousing in the area, check in which zoning they are included by searching for the town's zoning map and bylaw. The Zoning Bylaw document describes each zoning category,

and if there are any overlay-districts that can enable cohousing establishment. These documents are also helpful when analyzing the requirements for the site where the new cohousing could be located. Look for “Planned Unit Development” (PUD) or “Planned Residential Development” (PURD).

3. Look for cluster development requirements and “Open Space Community Development” bylaws in the jurisdiction. These usually dictate how and if cohousing can be established in the area.
4. If there are no bylaws that allow for the development of cohousing, or if it is unclear, contact the town’s planning staff who will explain in more detail the feasibility of cohousing in the area (Boyer, 2015). Remember that the town’s planning staff are valuable allies in the cohousing permitting process.
5. Review the town or jurisdiction’s comprehensive plan in an effort to find elements that resemble the communities’ goals. The comprehensive plans are documents that indicate how the town or city intends to grow in the upcoming years. Relating the cohousing community goals to the town goals stated on comprehensive plans usually justifies changes in zoning to allow for cohousing development (Boyer, 2015).
6. Advocate to have cohousing and other intentional clustered communities directly cited in the town’s comprehensive plan and other official documents.

7. At any point, contacting nearby cohousing groups and asking about their permitting process will aid in the site selection and planning processes.
8. More information on the initial processes of creating cohousing can be found by consulting:
 - a. “From Dream to Reality: The Development Process” chapter in “Creating Cohousing: Building Sustainable Communities” book by McCamant & Durrett (2011). This chapter is a great introduction to cohousing development strategies and processes.
 - b. “Creating a Life Together: Practical Tools to Grow Ecovillages and Intentional Communities” by Christian (2003). This book goes in depth on the stages of creating cohousing, from organizing a group to acquisition of property and how to navigate zoning issues.
 - c. “The Cohousing Handbook: Building a Place for Community” by ScottHanson & ScottHanson (2005). Starting in Chapter 3, this book specifically details the development process, buying land, legal issues, finance and budget, planning and the construction process.

Chapin (2011) cites Island Cohousing in Martha’s Vineyard, MA, as an example in which the key to success was to approach planning commissioners “not

as adversaries, but as public servants.” Planning commissioners usually have similar goals to individuals in cohousing forming groups, such as an interest in shaping a better community. Therefore, as with Pine Street Cohousing, Island Cohousing not only was approved by the commissioner, but also inspired the creation of new bylaws in the town that allowed for ongoing cluster development and the associated preservation of open space (Chapin, 2011).

5.1.2. Facilitators

There are many steps to be taken between initially establishing a forming group and completing the development of a cohousing community. Therefore, many communities choose to partner with developers, non-profits and/or designers in order to get the project conceptualized and built (McCamant & Durrett, 2011). As authors McCamant & Durrett (2011), discuss in their book:

“It is a substantial task for a group of people, inexperienced in both collective decision-making and real estate development, to take a project of this complexity. Most residents have little knowledge of financing, design or construction issues, let alone planning entitlements and subdivision processes.”

Therefore, this section lists renowned cohousing facilitators in the United States that help forming groups with the envisioning and design processes. In most cases, facilitators provide guidance on property selection and acquisition, permitting and regulations, and the building process:

1. The Cohousing Company: McCamant and Durrett Architects

Nevada City, CA

Cited in the present study, due to peer-reviewed articles and books on cohousing, McCamant and Durrett were the architects responsible for bringing the concept of cohousing from Europe to the United States.

Their business, The Cohousing Company, has provided workshop and design services for thirty presently established cohousing communities, and twenty cohousing groups in various stages of development (The Cohousing Company – McCamant & Durrett Architects, 2016). The company provides the following services:

- Architectural design, approval process and construction documentation;
- “Get it Built” Workshop, which provides forming groups with a overview of the cohousing establishment process, as well as guidance on design, construction and financial options;
- Design Process Workshop;
- Site Design Workshop;
- Common House Design Workshop;
- Private House Design Workshop;
- Design Development Workshop;
- Project Feasibility;
- Development Consultation, and;

- Affordable Cohousing Workshop.

Additionally, a collaboration between the Cohousing Company and Wonderland Hill Development Company has resulted in the formation of CoHousing Solutions, a sustainable neighborhood consultant group. They focus on establishing relationships between forming groups, developers and service providers (i.e. financiers, builders, contractors and government officials). Additionally, they aid forming groups in the various stages of development from site feasibility, to planning approvals and financing (CoHousing Solutions, 2016).

2. Kraus Fitch Architects, Inc.

Amherst, MA

Pioneer Valley Cohousing, as well as over 30 other communities across North America were designed and/or facilitated by Kraus Fitch Architects (Kraus Fitch Architects, Inc., 2016). They offer programming and design services for forming cohousing groups such as:

- Visioning and Mission Statement Crafting;
- Eco Programming;
- Site Programming and Schematic Design;
- Common House Programming and Schematic Design;
- Housing Unit Programming and Schematic Design, and;
- Getting the Work Done (design of work systems for community management after move in).

3. Urban Cohousing Associates, Inc.

Langely, WA

The company was established by Chris ScottHanson, an experienced development consultant that “assisted more than 35 cohousing groups across North America with all aspects of the cohousing development process” (Urban Cohousing Associates, 2014). The company aids forming groups with the following workshops and facilitated meetings:

- What is Cohousing?;
- Getting it Built Where you Live;
- Land Acquisition;
- Marketing and Membership;
- Design Process, and;
- Creating Affordable Cohousing.

Other facilitators include:

4. Village Resources Cohousing Consultants from Blacksburg, VA;
5. Schemata Workshop from Seattle, WA;
6. Tree Bressen Group Facilitation from Eugene, OR;
7. Eris Weaver from Cotati, CA;
8. CANBRIDGE Consulting and Facilitation from Rutledge, MO;
9. Cohousing Coaches from Berkeley, CA.
10. Integral Living Solutions, LLC from Portland, OR.

Interestingly, most facilitator groups cited above are comprised of architects (The Cohousing Company, Kraus Fitch Architects, Urban Cohousing Associates, Schemata Workshop and Intergral Living Solutions). Other professionals working within such groups have experience in the following areas: social work, public health, journalism, environmental and regional planning.

Through my research, I found that landscape architects join at some point during the design and planning processes led by architects. For example, Kraus Fitch Architects, Inc. is known to partner with Berkshire Design Group of Northampton, MA to develop comprehensive plans, site and planting designs for cohousing communities of western Massachusetts. However, as seen above, landscape architects are not found leading the field of cohousing consultation and facilitation. Landscape architects are trained to analyze, plan and design to optimize the relationships between people and the surrounding environment. Creating spaces where communities thrive in an environmentally sustainable manner is one of the flagships of the profession. Therefore, cohousing facilitation and design are fields that would greatly benefit from having landscape architects as leaders.

5.2 Design of Outdoor Areas

In this section, recommendations were drawn from several sources including published literature (articles, books and survey results) and on-site observation results, as cited in the methodology section 3.1.

After analyzing the age-related data obtained in this study, as well as in previous studies (Section 4.3.1), it was noted that outdoor spaces, and the general planning of cohousing, must possess accessible and ADA compliant features (i.e. paving, rails, etc.), as well gentle slopes in order to accommodate all residents, especially the aging population significantly present in cohousing. Additionally, including environmentally-friendly features, such as permeable paving and stormwater infiltration systems, can help cohousing achieve sustainability goals set by residents. Small town and rural communities, as explored in depth throughout this study, have the advantage of land availability and can have varying sizes and types of outdoor spaces displayed in the landscape.

5.2.1 Multi-functional community spaces

5.2.1.1 Commons

One of the main components of cohousing relies on buildings arranged around common spaces (i.e. courtyard and/or paths). According to Chapin (2011), “the commons is the glue that brings people together” in communities such as cohousing. Architects John Wolf and Tom Lyon interpreted Christopher Alexander’s book “A Pattern Language” and established a series of design patterns to guide the development of the Poplar Community in Boulder, CO. One of these guidelines refers to the commons, which they state should be shaped in order to accommodate various activities, such as playing and quiet observation (Chapin, 2011).

McCamant & Durrett, (2011), describe four organizing strategies for cohousing, including pedestrian streets, courtyards, combination of pedestrian

street and courtyard and one building with glass covered street (Figure 47).

Depending on the goals of the community, the different arrangements will account for different types of interactions in between neighbors. The courtyard arrangement will allow for more centralized activities, whereas the pedestrian street arrangement will decentralize activities. The authors advise that the courtyard “must be small enough not to leave an open void that detracts from the sense of community” (McCamant & Durrett, 2011).

Kraus Fitch Architects (2016) advise that the commons should not separate houses (front door to front door) more than 90’ apart, due to loss of potential encounters between neighbors (Figure 48). Providing seating (i.e. picnic tables) and a comfortable microclimate (such as a mix of sunny and shaded areas, and protection from wind), to ensure that people spend time in the space (Figure 48) (Kraus Fitch Architects, 2016). Additionally, providing shielded lighting (vs. unshielded) will produce a warm and secure feel (Chapin, 2011).

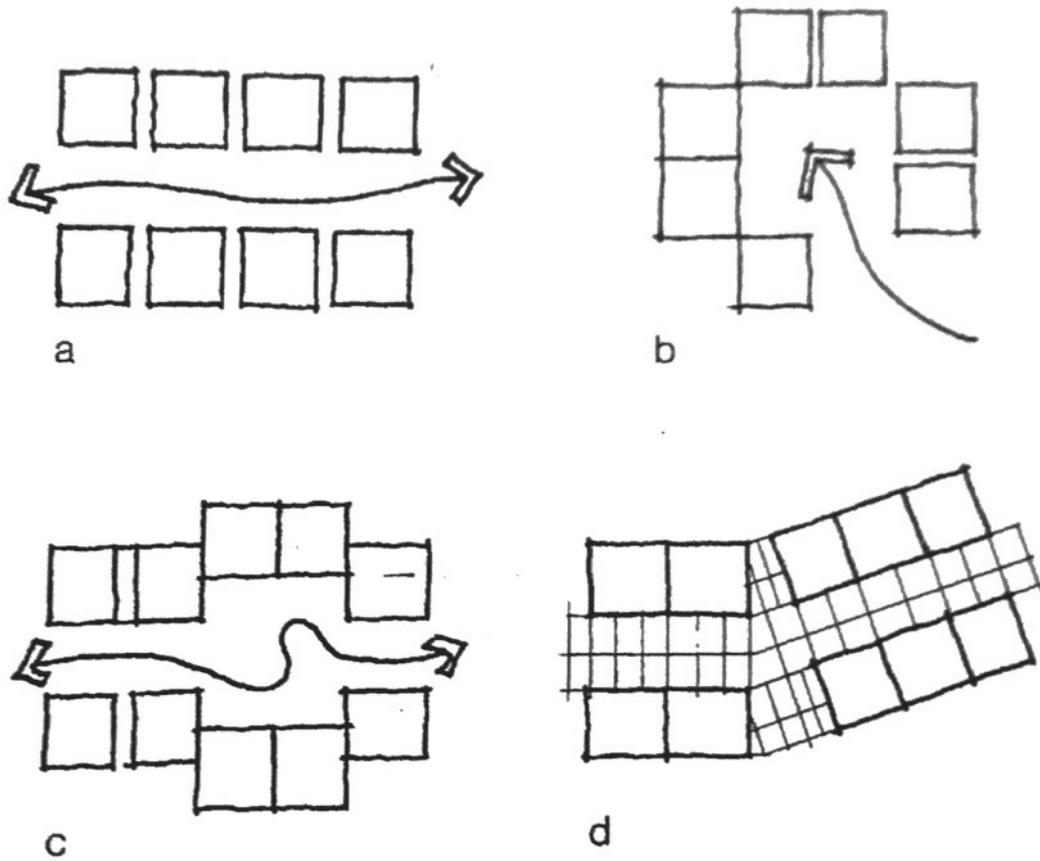


Figure 47. Different types of site plans. A) a pedestrian street, b) a courtyard, c) a combination of street and courtyard and d) one building. (McCamant & Durrett, 2011)

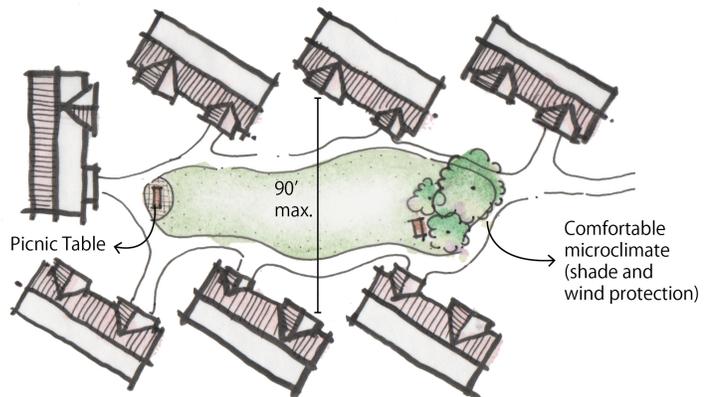


Figure 48. Elements for a successful commons according to Kraus Fitch Architects, Inc. (Image: Emilie Jordao)

5.2.1.2 Shared Paths

Authors McCamant & Durrett (2011) refer to shared paths in cohousing as “pedestrian streets.” Similar to the site observations findings in this study, the authors stated that shared paths are more than just circulation features, they also are places where many outdoor activities occur. They state that the pedestrian street “will not encourage interaction unless it is a size that feels full when people are in it, but it is not overwhelming when people are not” (ibid). They advise a width of five feet (which is wide enough for wheelchairs, strollers and carts). A width range, from front door to front door, of 30’-50’ ensures that neighbors see each other from across the pedestrian path, and increase chances of interaction (Figure 49) (Kraus Fitch Architects, 2016).

However, it is important to verify the local regulations on the size of cluster development paths, usually due to access needs for fire trucks and ambulances. One option is to contact the local Fire Marshall to inquire about specific path dimensions. In the case of Rocky Hill Cohousing, the town of Northampton ordered a minimum of an 8’ width for internal community paths to allow for emergency vehicle access (Figure 49). Another reason for contacting the local Fire Marshall during the design and planning processes is to inquire about house numbering, since it can significantly impact the location of houses during emergency situations (Galaski, personal communication, 2016).

In this study, activities such as playing, riding bicycles, jogging and walking dogs were observed in the shared paths. Therefore, paths need to be constructed to provide an even surface and gentle slope, in order to encourage various activities for

a wide range of ages and abilities (McCamant & Durrett, 2011). Another recommendation is to signal unevenness on surfaces or with signs.

Kraus Fitch Architects (2016) advise that pedestrian paths should be organic and winding, and provide nodes, or side nooks, for quiet observation and parental supervision. These nodes can be planned during the initial design process, or can be left to develop over time as the community desires (Figure 50) (Kraus Fitch Architects, 2016). Additionally, lighting in the pedestrian paths should use a combination of daylight sensors and timers, in order to promote energy efficiency as well as safety from ice and tripping hazards (Kraus Fitch Architects, 2016).

Authors McCamant & Durrett (2011) also encourage the use of materials such as permeable surfaces, for added environmental quality. These, together with green infrastructure elements (see Section 6.4.2), can help to manage stormwater on site, decreasing the community's environmental footprint and increase the residents' connection to nature.

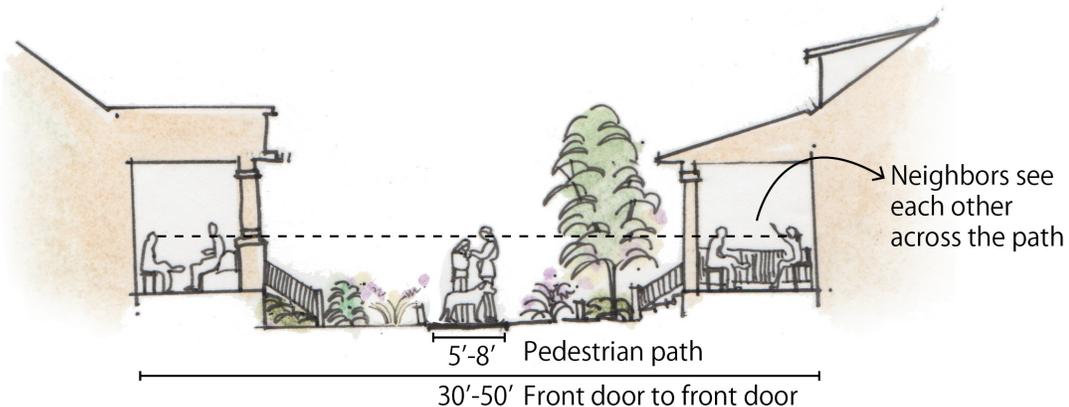


Figure 49. Pedestrian path proportions according to McCamant & Durrett (2011) and Kraus Fitch Architects (2016) (Image:Emilie Jordao).



Figure 50. Seating nook at Pioneer Valley Cohousing [Personal photograph taken in Amherst, MA] (2015).

5.2.1.3 Common Patio

McCamant & Durrett, 2011 refer to the area in front of the common house as “common plaza,” and they also concluded that it is a key area for interaction in the community. They state that the common patio allows for “people to come together before and after dinner, and hold summer barbecues or other events.” They found that communities usually chose to build common patios that are 1,200 ft² or smaller (McCamant & Durrett, 2011). Additionally, providing visual connection between the indoor dining room and the outdoor patio encourage spontaneous meet ups and the supervision of children by adults (Figure 51) (Kraus Fitch Architects, 2016).

Chapin (2011) suggests that the common house – and common patio– be located centrally in the community, especially between parking areas and dwelling units. This way, there is an increased chance of neighbors running into each other while going from the parking to their houses, as well as being able to see activities

happening and feel more compelled to join in (Chapin, 2011). Additionally, providing playing objects (Figure 52), seating in the perimeter (i.e. seating walls and movable furniture), as well as a “comfortable microclimate,” through a mix of sunny and shaded areas, and wind protection, ensures a pleasant environment where people will chose to spend time and perform activities (Figure 51) (Kraus Fitch Architects, 2016).

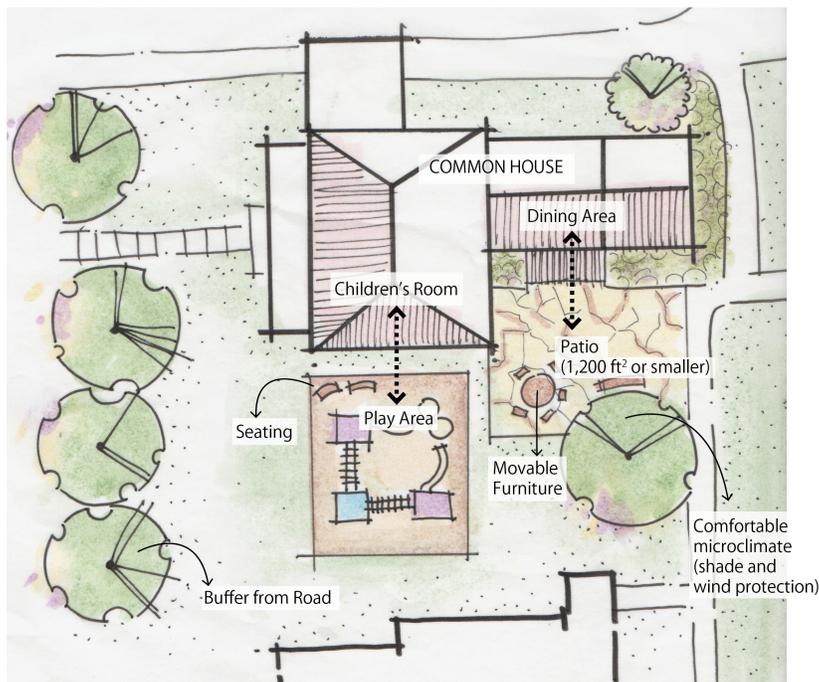


Figure 51. Elements for successful patio and play area (Image: Emilie Jordao).



Figure 52. Hoops provided by Rocky Hill Cohousing residents [Personal photograph taken in Northampton, MA] (2015).

5.2.1.4. Play Areas

McCamant & Durrett (2011) understand that one of the main goals of cohousing is to design “child-friendly environments.” Living in cohousing allows for children to have more interaction with other children and their parents, so they have more opportunities for play and supervision (McCamant & Durrett, 2011). Access to outdoors and ability to walk freely is a key part of the development of children between ages 4-11, and will contribute to increased self-esteem, independence and sense of identity (Chapin, 2011). According to Margolis & Entin (2011), 80% of communities surveyed in the 2011 Survey of Cohousing Communities have playgrounds and play structures for their children.

In this study, playing accounted for the third most frequently observed activity, often times accompanied by activities of talking and supervising. Adults supervising children will spend more time outdoors and have more opportunities to

meet neighbors. Also, there are more opportunities for collaboration, such as supervising rotation among adults in the community, which can strengthen community ties and expose children to different residents, making them feel safer in their own neighborhood.

Therefore, locating the play area near the common patio and common house is crucial for better supervision because these are places with frequent activity (Figure 51). Preferably, the main play area should be located near the children's room and with visual connection to the dining room in the common house (Kraus Fitch Architects, 2016). There must be seating for supervising adults in the premises, as well as a comfortable microclimate. Providing a buffer, preferably with vegetation or lawn, in between the play areas and vehicular roads is also advised.

5.2.1.5 Open space

According to Sanguinetti (2014), theories such as “biophilic design” by Christopher Alexander et al. provide an insight into the types of outdoor spaces that can increase the connection of cohousing residents to nature. These are “access to water, wild-growing gardens ..., and blurred boundaries between natural and built elements” (Figure 53). These elements also contribute for a sustainable landscape, as explored in section 6.4. In general, outdoor spaces should have defined edges in order to have the “quality of containment and holding.” Trees, shrubs, rocks and other materials can be used to create the defined edges (Chapin, 2011).



**Figure 53. Naturalistic Planting at Liberty Village Cohousing
(Image: Liberty Village Cohousing, 2011)**

5.2.2 Specific-use community spaces

Areas of specialized activities generally have restricted uses, and are used less frequently than multi-functional spaces. Therefore, it is advised that these areas remain on the edge of the core community, in order to concentrate the spaces with higher and multi-activity frequency in the inner side of the development.

5.2.2.1 Community Gardens

Authors McCamant & Durrett (2011) highlight the importance of community gardens in facilitating interactions between cohousing residents, and state that these should be available to all households. As most activities taking place here are related to maintaining the grounds and harvesting food, this was considered an area of specialized activity and can be accessed by all residents if kept to the outskirts of

the community, preferably in an area visible from the parking lot. This way, the garden will not be a visual burden in the winter, when most crops are not green, or if there are gaps in the garden maintenance (Figure 54).

According to Chapin (2011), many neighborhoods choose to build community gardens within their boundaries because by doing so, neighbors get to “know and learn from one another, and form long-term friendships.” Around 94% of communities surveyed in 2011 possess community gardens and utilize the produce in common meals (Margolis & Entin, 2011).

Most of the beauty of cohousing resides in the diversity of ideas, with an underlying common goal of strengthening community. Therefore, if not all future residents want to partake into gardening activities, there could be specific groups created within the community for this purpose. The method of “affinity groups” is used at Pioneer Valley Cohousing with success. This way, amenities can be created and maintained, and offer residents the opportunity to join different activities at any point in time.

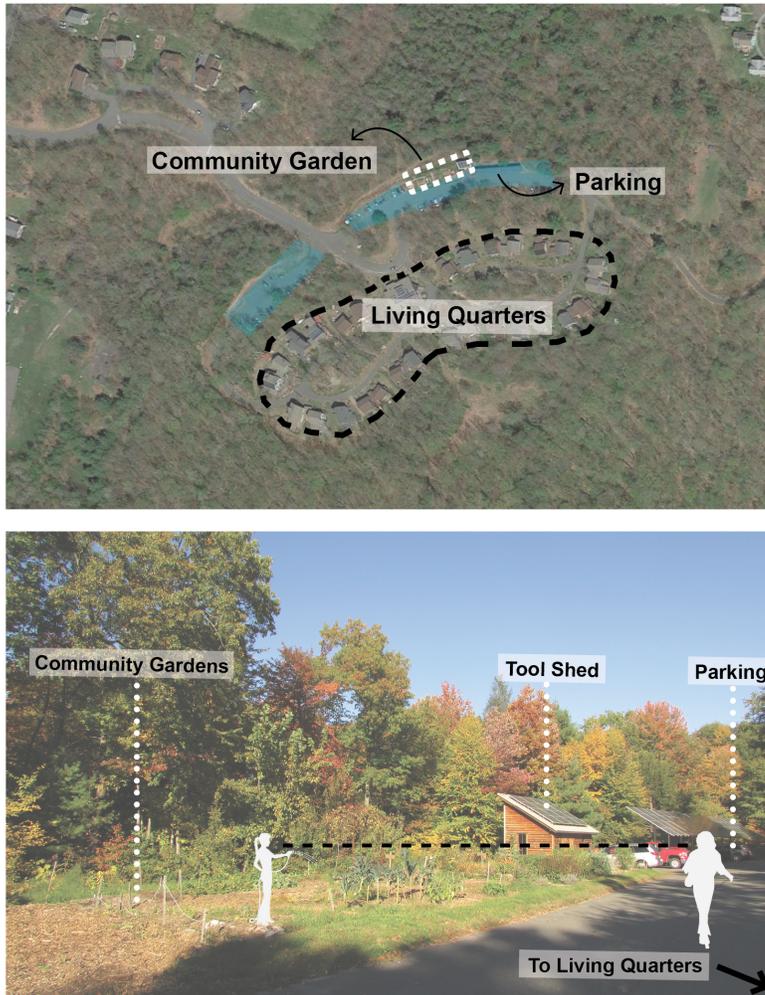


Figure 54. Rocky Hill Cohousing Layout and Community Gardens (Basemap: Google Earth, Images: Emilie Jordao)

5.2.2.2 Parking Lots

In cohousing, parking is usually placed on the outskirts of the community, in order to establish the core as a pedestrian-only area for safety and spontaneous activities (Chapin, 2011; McCamant & Durrett, 2011). Many communities also encourage resource sharing (i.e. car-sharing) and tend to minimize the overall number of parking spaces in order to promote broader sustainability goals (Galaski, personal communication, 2016; Williams, 2008). However, cities and towns usually

have parking requirements for residential units, and accommodating fewer the required minimum number of parking spots can only be achieved by acquiring special permits through the Permit Granting Board or Special Permit Granting Authority (Town of Amherst, 2014b). For example, the town of Amherst, MA, requires a minimum of two parking spaces per residential unit, and Northampton, MA allows for a minimum of one space per residential unit (City of Northampton, MA, 2015a; Town of Amherst, MA, 2014b). Examples of North American cohousing communities and their unit and parking availability are displayed on Table 3 (Cohousing Association of the U.S. Resources Committee, 2011).

Table 3. Example of cohousing communities and the established number of parking spaces.

Case Study	Location	Number of Households	Number of Parking Spots
Pioneer Valley Cohousing	Amherst, MA	32	•48 Residential •8 Visitor •13 Commercial
Pine Street Cohousing	Amherst, MA	11	•22 (Residential + Visitor)
Rocky Hill Cohousing	Northampton, MA	27	•56 (Residential + Visitor)
Columbia Ecovillage	Portland, OR	37	•37 Residential
Creekside Commons Cohousing	Courtenay, Canada	36	•36 Residential •2 Accessible •28 Visitor
Trillium Hollow Cohousing	Portland, OR	29	•43 Residential •3 Visitor
Windsong Cohousing	Langley, Canada	34	•48 Residential •7 Visitor

Additionally, according to Kraus Fitch Architects (2016), parking lots should be, at most, 250' away from units on flat grade, or 150-200' on sloped grade, in order to maintain a comfortable walking environment.

5.2.3 Other Specific Use Spaces

According to Margolis & Entin (2011), half of the communities in the survey possess spaces such as fields (Figure 55) or orchards; 33% possess chicken raising areas (Figure 56), and the same percentage possess a hot tub and/or sauna. About 20% of communities have ponds in their properties.

In the present study, when analyzing specific use areas, most activities were observed in the community gardens and orchards. Therefore, including these types of spaces in the design of cohousing can have higher neighbor interaction rates when compared to other specific use spaces. Other spaces where activity was observed, although with less frequency, include playing fields and volleyball nets.

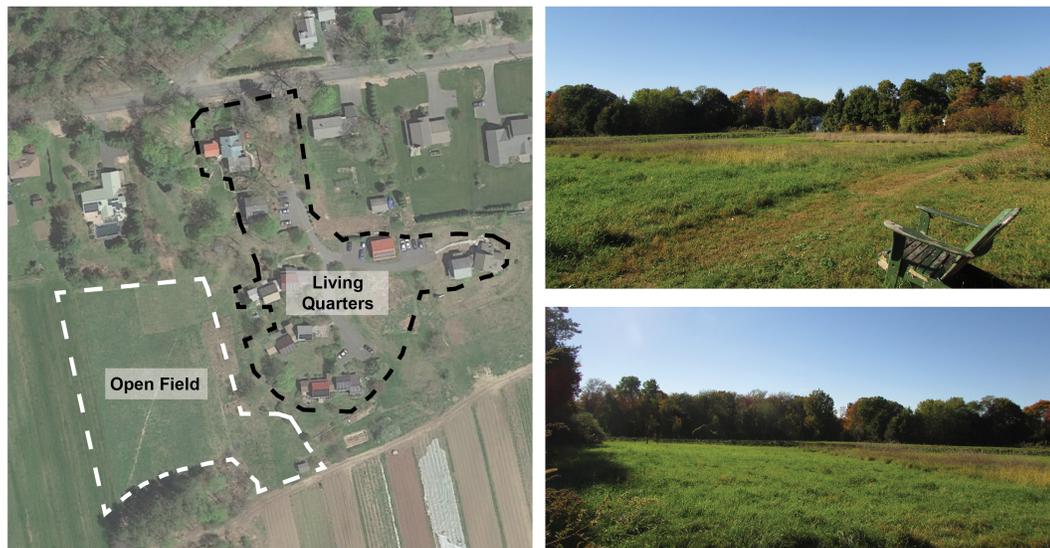


Figure 55. Open Field – Pine Street Cohousing (Basemap: Google Earth, Images: Emilie Jordao)

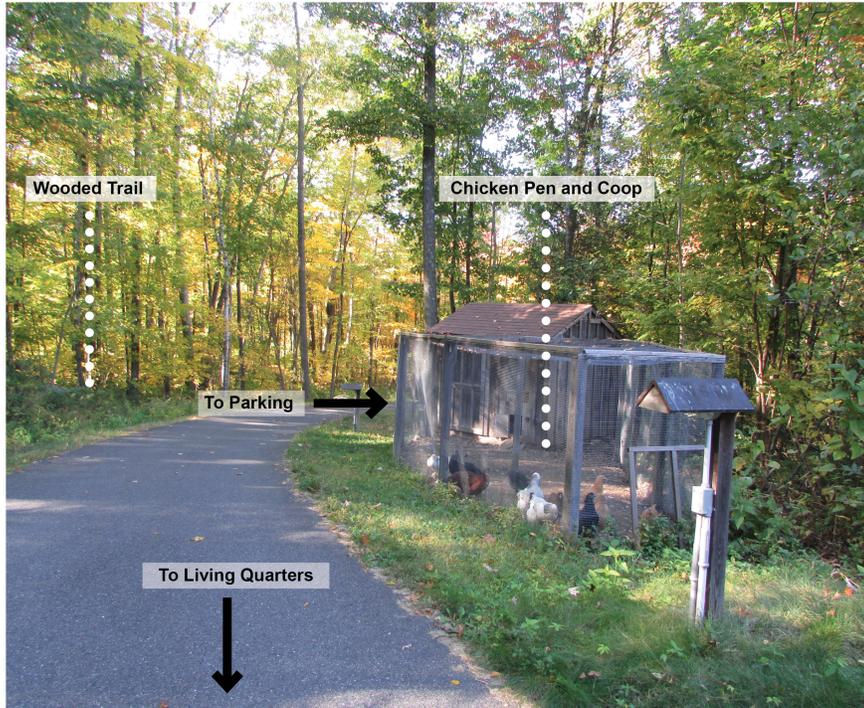


Figure 56. Chicken raising area on the outskirts of living quarters at Rocky Hill Cohousing (Image: Emilie Jordao)

5.2.4 Semi-private spaces

5.2.4.1 Layers from public to private spaces

Due to the proximity of dwelling units in cohousing communities, it is advisable to create a layering system from public to private spaces whenever possible (Chapin, 2011). The first layer of privacy serves to differentiate the public realm (parking area and street) from the community realm via an implied (narrowing the entranceway) or formal gateway (ibid). From the shared paths (community realm) to the private unit there can be five layers of privacy: 1) perennial border; 2) low fence; 3) front yard; 4) porch frame; and 5) porch, which ideally “occur within a span of 18ft” (ibid) (Figure 57). Residents are encouraged to plan and design their

own private front gardens, as a way to “give each home its own personal flavor,” and provide a diversity of landscaping approaches within the community (ibid).

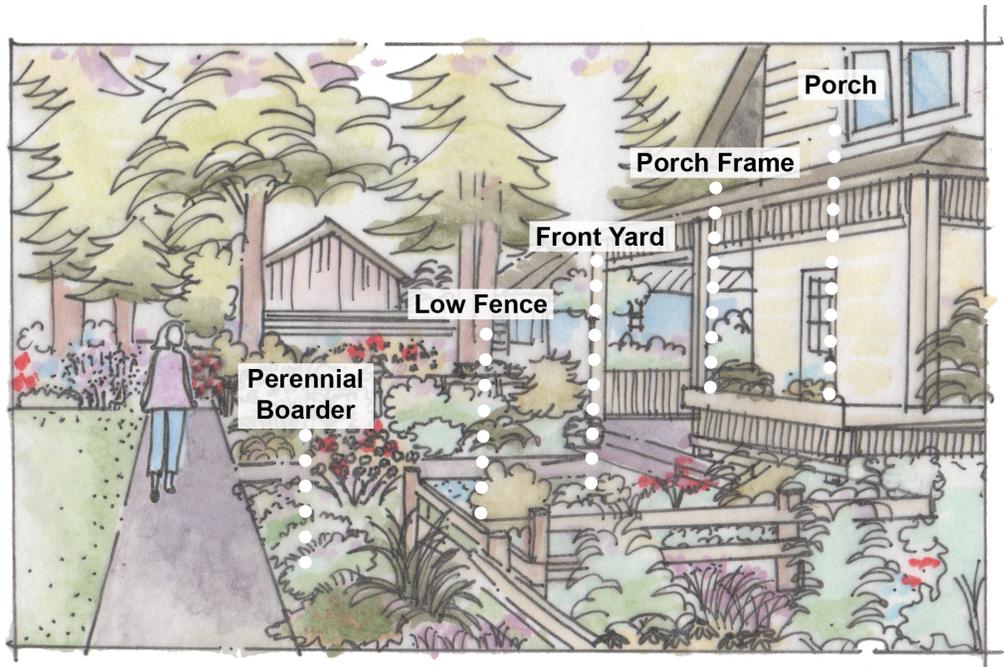


Figure 57. Layers of Privacy from path to front door according to Chapin (2011) [Image: Emilie Jordao].

5.2.4.2 Porches

According to McCamant & Durrett (2011) “direct access in between private dwellings and semi-private porches increases the use of outdoor space.” Porches allow for additional community interaction because of the proximity to shared paths and the outside community, while providing residents with the feeling of being in their own space. A minimum depth of 6’-6” allow for the placement of table and chairs on the porch, and will create an “outdoor room,” rather than just a buffer space (McCamant & Durrett, 2011). Measurements of about 9’-10’ deep and 12’ long allow the porch to become an “extension of the main living space” (Chapin, 2011). Chapin (2011) also provides a series of design keys for a successful porch area. The

author states that porches should be located at the front entrance, overlooking the pedestrian streets, or the shared paths. He also advises against locating the passage to the front door through the middle of the living area of the porch, like a room, the activities happening there would be disrupted if there's constant circulation of people through the middle of the space (ibid.). Chapin also states that keeping an open porch (rather than enclosing it with glass, or screens), and providing a defined edge by using railings (27" to 30" high), will allow for the optimum socialization in the porch area (Figure 58).

McCamant & Durrett (2011) found that cohousing residents spend "80 percent of their time in the front of their house and 20 percent on the back," which differs from the suburban neighborhood models. In this case, porch design is very important to foster interactions in semi-private spaces.

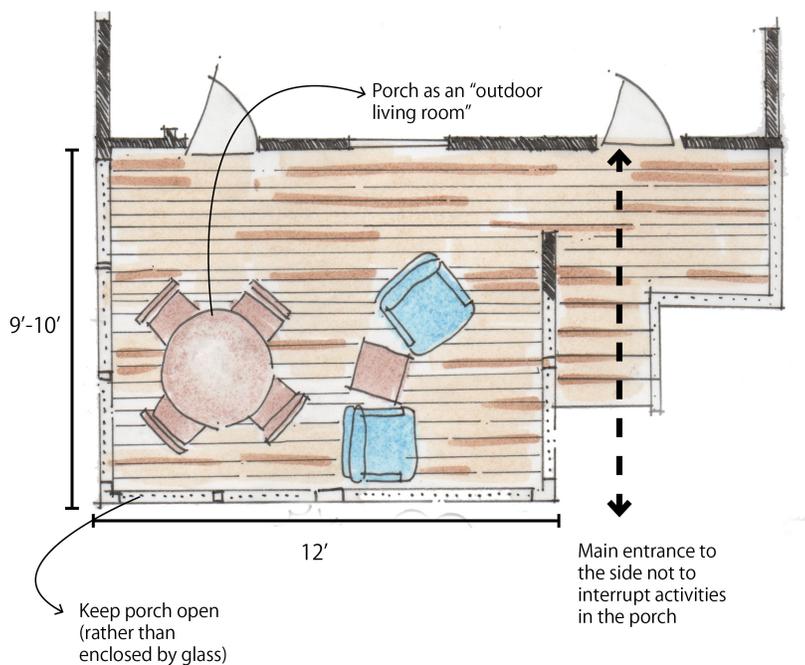


Figure 58. Porch dimensions and layout according to Chapin (2011) [Image: Emilie Jordao].

5.2.5 Sustainable Landscapes

The concept and practice of cohousing is inherently environmentally and socially sustainable. As pointed out in the literature review, the proximity of houses and strong social networks allow for preservation of open space and sharing of resources. Additionally, many cohousing communities such as the ones explored in this study, have decided to add environmentally friendly features such as solar panels and community gardens.

However, there are plenty of opportunities to explore sustainable alternatives in the landscape as well. Examples are land preservation, green infrastructure, naturalistic and edible plantings. Another important factor that can dramatically increase environmental sustainability of cohousing, is the location of the development itself. Across this study, it was noted that many cohousing communities in small-town and rural settings tend to be located away from town centers and public transportation routes. As a consequence, these end up being very car-dependent communities. Implementing smart-growth ideas such as locating cohousing developments closer to town centers, within public transportation routes and adding commercial areas, is essential to meet sustainability goals of cohousing.

5.2.5.1 Land Preservation

According to Margolis & Entin (2011), about 25% of communities polled have permanently protected land through conservation easements. In this study, all three case study communities had varying amounts of preserved open space, ranging from 4.8 to 19.6 acres. As cited in section 4.1, certain towns, like Amherst,

allow for flexible development in exchange for open space preservation through Open Space Community Development bylaws.

Therefore, communities in rural or small town settings might choose to acquire more land than they plan to develop, in order to protect habitat and open space from future development. Cohousing communities also benefit from maintaining forested and open space areas by establishing buffers and trails for the enjoyment of their residents. Additionally, in expanding small towns and urbanizing rural areas, preserving open space usually comes as an important topic for town governments that allow for cohousing developments as long as they preserve open space (Section 4.2).

5.2.5.2 Green Infrastructure

Green infrastructure is a series of methods to promote infiltration of storm-water (ASLA, 2016). This can be achieved through the construction of swales and ponds that run through the common areas, as seen in the Village Homes community in Davis, CA (Chapin, 2011). These features, such as rain gardens, can improve landscape diversity, since they often display an array of water-loving trees, shrubs and grasses (Dunnet & Clayden, 2007). Another example of this approach is the Liberty Village Cohousing Neighborhood in Union Bridge, MD (Liberty Village Cohousing Neighborhood, 2011). Alongside many environmentally-oriented features, they possess a series of rain gardens in the commons to filter water from the shared paths (Figure 58 and 59). Swales are located on the outskirts of the community (in open green space) to aid in filtering and slowing water from the

parking lots (Figure 59) (Liberty Village Cohousing Neighborhood, 2011). By providing for sustainable stormwater management, green infrastructure can also help residents have higher connectedness with the environment, as explored by Sanguinetti (2014).

Besides the environmental and aesthetic values of green infrastructure, this landscape design approach can also create a recreational and learning opportunity for children (Dunnet & Clayden, 2007). As found in the present study, playing accounted for the third most frequent activity in cohousing and linked activities such as communication and parental supervision. Therefore, creating environments where children can play may increase the socialization of the community as a whole. Installing rain chains, exposing water pathways, and creating water cascades (Figure 60) can accomplish these broader goals.

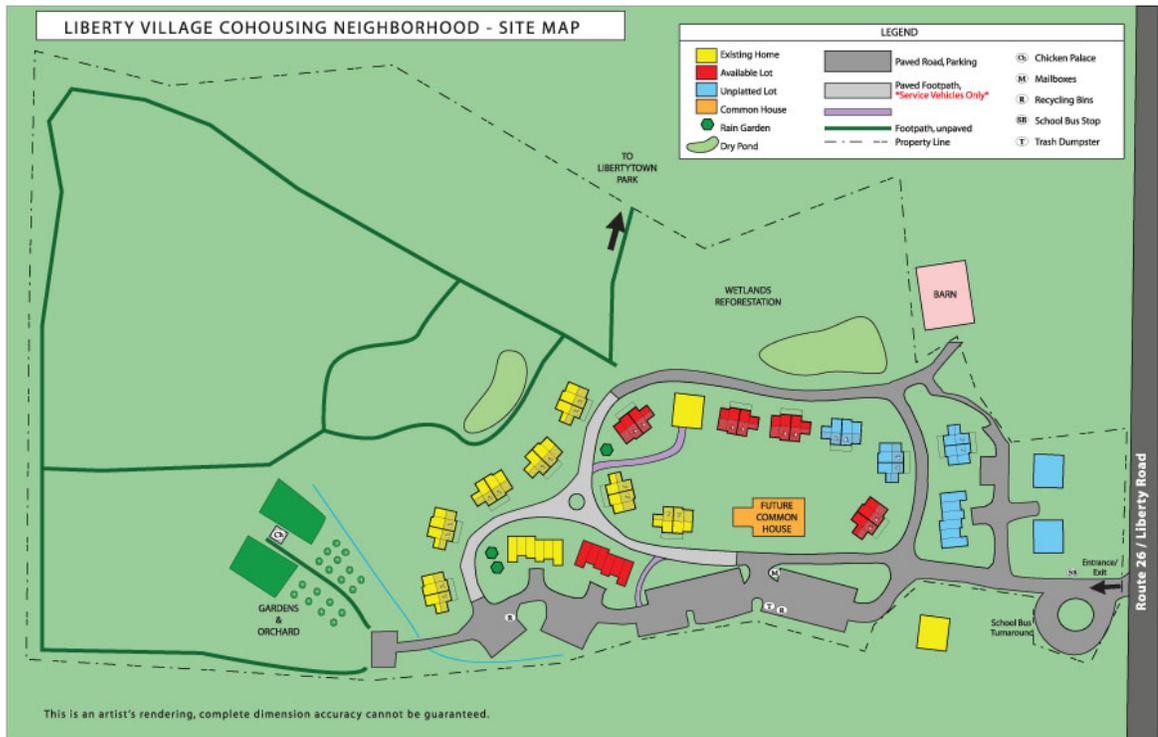


Figure 59. Liberty Village Cohousing Neighborhood site plan. Note the raingardens in community areas and dry ponds - at the end of swales - in the outskirts of community (Liberty Village Cohousing Neighborhood, 2011).



Figure 60. Left) Exposed waterway at the Cedar River Watershed Education Center (Image: Jones & Jones via ASLA, 2016), and (Right) Rain garden at Liberty Village Cohousing (Image: Liberty Village Cohousing, 2011).

5.2.5.3 Naturalistic Planting and Edible Landscapes

Planting design can also have a considerable impact on the sustainability of a landscape. According to Margolis and Entin (2011) around 65% of communities that participated in the survey possess flower gardens and paths other than the main walkways. Additionally, about 75% of communities “utilize low-impact landscaping and edible landscape and/or permaculture.” Therefore, promoting sustainability through naturalistic planting and edible landscapes is a practice employed by most cohousing communities across the U.S.

Generally, the more diverse or complex a planting plan is, the more it will attract wildlife and provide habitat value (Dunnet & Clayden, 2007). Landscapes become more attractive to wildlife in the display “mosaics of different habitats such as grasslands, wetlands, woodlands and scrub” (ibid) (Figure 53). The Liberty Village Cohousing Neighborhood is a good example of this approach to planting. The community features raingardens and dry ponds (a wetland component), woody upland vegetation in a reforestation area on the property (a woodland component) and a warm season grass meadow composed of perennial grasses, legumes and wildflower species (a grassland component) (Liberty Village Cohousing Neighborhood, 2011).

Additionally, planting can be used to reinforce the human-scale, village-like aspects of cohousing, especially in a more rural context. Tall, native trees may form a tall visual backdrop to the houses. In the interior of the community, native and non-invasive small trees and shrubs can be introduced to relate to the scale of the human (Chapin, 2011). In front of houses and other planters, perennials and

annuals, which change rapidly with seasons, may add texture and diversity to the landscape (ibid).

5.3 Cohousing Practices

Other than design, programming or cohousing practices, help to gather the community and foster interaction on a regular basis. As discussed in the introduction and literature review, there is no single component that defines cohousing. Instead, it is a combination of design, practices, social structures and ideologies (Durrett, 2009; Sanguinetti, 2014; Williams, 2009;). Therefore, this recommendations section details only the most common successful practices in cohousing observed in communities both in the U.S. and abroad.

5.3.1 Core Practices

Sanguinetti (2014) described “core practices” as activities that are “almost definitional of cohousing” such as community meals, smaller dinner groups, community meetings, smaller management team meetings, and community work days. Choi (2014) found that steering committee meetings and community meals were the activities that most attracted residents on a regular basis. Therefore, future cohousing communities should include the above mentioned activities in their programming schedule in order to promote interaction between residents.

When questioned about the benefits of cohousing, respondents of the 2011 Survey of National Cohousing Residents highlighted the sense of community fostered in cohousing (Margolis & Entin, 2011). This sense of community is

enhanced by interpersonal interaction and activities done together. Margolis and Entin state that:

“Cohousers wrote specifically about sharing meals, participating in basic social activities together such as watching movies, going for a walk, attending cultural events and enjoying creative day to day living where there are always opportunities for interactions and shared projects.”

They also explored the number of community meals hosted for the cohousing for which residents answered the survey (Table 4). Most of communities hold two meals per week, and in over half of communities surveyed, most residents attend community meals regularly (ibid).

Table 4. Frequency of common meals per week. Data from the 2011 National Survey of Cohousing Residents (Margolis & Entin, 2011).

Common Meals per week	Percent of communities
One meal	24
Two meals	33
Three meals	23
Four meals	6
Five meals	5
Six or more	0
Other (potlucks, informal meals and less than one/week)	9

Most communities reported having four community workdays per year, usually

during the weekend (Margolis & Entin, 2011). These activities usually comprise of “cleaning up the community after the winter, preparing for spring or summer planting, substantial building, or a landscaping project” (ibid).

Therefore, it is strongly encouraged that communities hold at least one common meal per week and two to four workdays per year. Whenever possible, meals, or larger celebrations (such as Labor Day, the 4th of July, etc.), should be held outside in the common patio. Margolis and Entin (2011) found a negative correlation between attendance to community events and cohousing foreclosures; their data suggests that greater the attendance to meals and workdays results in fewer foreclosures cohousing communities experienced. As previously mentioned in this study, outdoor activities increase the chance of being noticed by other community members, who then may feel compelled to join (Chapin, 2011). Additionally, holding meals and other activities outside can increase the connectedness of residents to nature and their cohousing environment, leading to improved stewardship and sense of ownership (Sanguinetti, 2014).

5.3.2 Other Practices

Aside from core practices such as common meals, management meetings and workdays, other types of programmed practices attract groups of people based on specific interests. These additional activities are essential for community interaction because they appeal to different groups and ensure that all members are linked in some way.

Margolis & Entin (2011) quantified the types and attendance frequency of which these activities occur in the communities surveyed. In the table below (Table 5), about 68% of communities polled hold frequent (at least once a month) exercise classes, and 65% dinner clubs other than community common meals. Additionally, about 60% of communities promote occasional (at least once a year) dance classes.

Table 5. Frequency which different activities occur in cohousing (Margolis & Entin, 2011).

Social Group	Occasional	Frequent
Book group	52%	49%
Women's group	57%	43%
Men's group	58%	42%
Dinner club*	35%	65%
Meditation group	39%	61%
Dance classes	60%	44%
Exercise classes	32%	68%

*(other than community common meals)

As explored above, exercise classes held at least once a month, and dance classes held at least once a year, contribute for interaction in between residents. If held outdoors, there will be an increased probability of being noticed by other residents and people feel more compelled to join activities if they can see them happening (Chapin, 2011). Also, performing outdoor activities increases residents' well-being and connectedness to the surrounding environment (Sanguinetii, 2014; Thompson,

2005). Other activities successfully held in cohousing include “yoga, game nights, writing groups, singing, and movie nights” (Margolis & Entin, 2011).

CHAPTER 6

CONCLUSION

Cohousing's main goal is to establish cohesive communities through participatory process, deliberate neighborhood design, extensive common facilities, complete resident management and non-hierarchical decision making. These are usually small-scale, people-oriented communities that cluster homes and infrastructure in order to encourage spontaneous interactions between residents, and promote efficient use of the land. Also, through programmed activities and shared visions and goals, cohousing communities ensure residents interact periodically and have high-degree of compatibility.

In the United States, the cohousing movement is mainly resident-led, which imposes time and financial difficulties for the establishment of such communities. Additionally, even though cohousing has been present in the country since the 1990's, zoning and subdivision regulations have not grown to accommodate such cluster developments that share and protect open space. Cohousing is also not represented within certain data sets, such as land use data by MassGIS.gov, which does not possess a category that is inclusive of cluster developments such as cohousing and ecovillages. This causes communities to go unnoticed, especially via long-distance research.

Many cohousing professionals and residents share positive ideas about the model. However, cohousing has its drawbacks. Experts argue living in cohousing is unaffordable, due to higher than market-rate prices and membership dues. Therefore, cohousing fails to house a diverse population. Additionally, cohousers

might have limited control over their land, as some communities have the right to deny potential buyers if their goals are not compatible the community's. Many cohousing communities, specially in rural and small town settings, are located within a distance from town center and infrastructure, and are not on public transportation routes, which fails to meet the sustainability goals established by the model.

By analyzing the literature, case-studies, on-site and zoning data, the present study has the goal to better understand the role that landscape plays in the socialization among cohousing residents, especially when it comes to spontaneous activities. It is safe to conclude that the landscape plays crucial role on the interaction between residents in cohousing. People see, greet and interact with one another outside; the landscape is an extension of the common buildings that they share. Outdoor spaces provide residents with the opportunity to form relationships and perform activities together. In the rural and small town context, cohousing communities benefit from abundant land, and have the opportunity to establish varied types outdoor spaces as well as preserve land. A number of best design practices can be applied to multi-functional, specific-use and semi-private spaces, in order to encourage spontaneous interactions as well as to accommodate programmed activities. It is important to note that these practices can be employed on different types of housing developments, such as condominiums, apartment complexes and other multi-family communities. The main goal of the present design recommendations for outdoor areas is to create safe, person-scale and enjoyable spaces that encourage walking, exercising, playing and interacting with others. Any

housing project seeking to foster these elements can benefit from applying the guidelines to their design and planning processes.

The present on-site research represent a micro-study of cohousing communities in western Massachusetts. In order to acquire more statistically significant results, future research should perform observations in a larger number of cohousing communities across a certain region or country. Additionally, performing frequent observations will allow for the analysis of daily, weekly and seasonal changes in activities that occur in cohousing. In order to acquire qualitative data on spontaneous activities in cohousing, future research should employ self-reporting methods such as questionnaires and personal interviews. More specifically, future research should consider the role of the landscape in urban communities, since these possess lower land availability and have to utilize their site more efficiently.

The field of cohousing facilitation and design can benefit from landscape architects playing leadership roles in the process, since such professionals are trained to analyze, plan and design to optimize relationships between people and the surrounding environment. Landscape architects can ensure communities have higher degree of environmental sustainability by implementing green-infrastructure, land preservation and smart-growth concepts throughout the design process.

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