POLICY AND DESIGN FOR CHANGING LIVING SITUATIONS:
AN ARCHITECTURAL PERSPECTIVE

A Thesis in
Architecture
by
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Submitted in Partial Fulfillment
of the Requirements
for the Degree of

Master of Science

August 2019
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ABSTRACT

American society is aging, is more culturally diverse than ever before, and what was once considered to be the traditional American family, parents and two children, is also changing. While these demographic shifts will have major impacts on all aspects of U.S. society, this thesis asks what impact they will have on the built environment, specifically housing. Throughout modern American history, the attainment of the “American Dream,” a single-family house and yard located in the suburbs, has defined the American landscape. Housing design has not adapted to current domestic needs, and current zoning laws disrupt the natural ebb and flow of household demographics by restricting land-use by household type and preventing integration of various sizes and styles of housing. This thesis analyzes current trends and recent changes in U.S. demographics; literature on multigenerational and shared living; and the ways policy hinders adaptation of housing and communities for multigenerational and shared living. Based on these analyses, and a case study in York, Pennsylvania, this thesis will then propose potential adaptations of zoning regulations, community planning, and single-family housing to acknowledge multigenerational and shared living arrangements.
# TABLE OF CONTENTS

**LIST OF FIGURES**

v

**Chapter 1 INTRODUCTION**

1

WHY ARE LIVING ARRANGEMENTS CHANGING?

4

Aging

7

Diversified Culture

10

Changing Family Dynamics

13

THE DYNAMICS OF SHARED LIVING ARRANGEMENTS

17

Multigenerational Household Defined

19

Why Choose Shared Living Arrangements

21

**Chapter 2 HOUSING AND COMMUNITIES FOR SHARED AND MULTIGENERATIONAL LIVING ARRANGEMENTS**

23

COMMUNITY: POLICIES AND PROPOSALS

24

HOUSING: POLICIES AND PROPOSALS

28

**Chapter 3 YORK TOWNSHIP, PENNSYLVANIA: A CASE STUDY**

32

THE RULES THAT GOVERN HOUSING

35

Zoning Codes

36

Building Codes

43

**Chapter 4 A PROPOSAL FOR FUTURE HOUSING AND COMMUNITIES**

53

ZONING

54

Integration of Housing Sizes

55

Promoting a Pedestrian Experience

58

Development Incentives and Restrictions

62

Definition of Family

65

COMMUNITY

65

Promoting the Pedestrian Experience at a Neighborhood Level

66

Densify Lots with Infill Units and Integrate Housing Size

70

Modularity and Redundancy

75

HOUSING

77

Existing Housing

78

Options for Modification

81

Proposed Single-Family House

88

**Chapter 4 CONCLUSION**

97

**BIBLIOGRAPHY**

101
# LIST OF FIGURES

<table>
<thead>
<tr>
<th>Figure</th>
<th>Description</th>
<th>Source</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>1-5</td>
<td>Percent of Population Living Alone by Age</td>
<td>U.S. Census Bureau Current Population Survey 2018</td>
<td>9</td>
</tr>
<tr>
<td>1-7</td>
<td>Foreign-Born Population by Origin</td>
<td>U.S. Census Bureau, American Community Survey, 2010</td>
<td>12</td>
</tr>
<tr>
<td>1-10</td>
<td>Growth of Multigenerational Households by Type</td>
<td>U.S. Census Bureau American Community Survey 2012 and 2016</td>
<td>15</td>
</tr>
<tr>
<td>1-11</td>
<td>Multigenerational Households Over Time</td>
<td>1950-2000 Decennial Censuses and 2006-2016 American Community Survey</td>
<td>16</td>
</tr>
<tr>
<td>3-2</td>
<td>One- and two-family dwellings per the 2015 International Residential Code</td>
<td>Sketch interpretation by author</td>
<td>44</td>
</tr>
<tr>
<td>3-3</td>
<td>R1 transient sleeping units with more than ten occupants</td>
<td>Sketch interpretation by author</td>
<td>45</td>
</tr>
<tr>
<td>3-4</td>
<td>R2 sleeping or dwelling units with more than sixteen permanent residents</td>
<td>Sketch interpretation by author</td>
<td>46</td>
</tr>
</tbody>
</table>
Figure 3-5: R3 no more than two dwellings, small group living facilities, and small transient lodging houses - Sketch interpretation by author

Figure 3-6: R4 Small-scale long-term care facility - Sketch interpretation by author

Figure 4-1: Valley View Road neighborhood in York County, Pennsylvania depicting growth over decades - Source: Google Maps. “Valley View Road, York Pennsylvania.” https://www.google.com/maps/place/Valley+View+Rd,+Spring+Garden+Township,+PA+17403/@39.9467254,76.6900186,574m/data=!3m2!1e3!4m5!3m4!1s0x89c88ed55c29302f:0x289fea3bb11f8bb9!8m2!3d39.9467254!4d-76.6878246 16 March 2019

Figure 4-2: Existing zoning: areas segregated by function and separated by roadways and barriers. Housing is segregated by density and size – Diagram by author

Figure 4-3: Proposed Zoning: Housing sizes are integrated within residential areas, which are also centered on a small community center. Larger commercial areas are centered within a cluster of residential areas. Pedestrian areas and pathways connect all relevant neighborhoods and resources – Diagram by author

Figure 4-4: Street Section to Promote the Pedestrian Experience – Diagram by author

Figure 4-5: Existing Community – Graphic developed from Zoning Map of York Township http://www.yorktownship.com/zoning-map/ Adopted 11 September 2016

Figure 4-6: Existing Community Updated to Promote the Pedestrian Experience – Graphic interpretation by author developed from Zoning Map of York Township http://www.yorktownship.com/zoning-map/ Adopted 11 September 2016

Figure 4-7: 2,500 square foot home with a two-car garage on approximately 10,000 square foot lot with an accessory dwelling unit added, either attached to the principal residence or separate – Diagram by author

Figure 4-8: An average single-family lot divided into two with second, smaller house added – Diagram by author

Figure 4-9: Random lot size integration – Diagram by author

Figure 4-10: Gradual increase in lot size – Diagram by author

Figure 4-11: Community Modified With Integrated Lots and Housing Graphic interpretation by author developed from Zoning Map of York Township http://www.yorktownship.com/zoning-map/ Adopted 11 September 2016

Figure 4-12: Modular housing unit sizes – Diagram by author

Figure 4-13: Existing 2,500 square foot house with two-car garage – Diagram by author

Figure 4-14: Interior Conversion – Diagram by author
Figure 4-15: Unfinished Area Conversion – Diagram by author 84
Figure 4-16: Addition – Diagram by author 85
Figure 4-17: Accessory Dwelling Unit – Diagram by author 86
Figure 4-18: House with two-car garage, designed to adapt over time and as the occupants change – Diagram by author 91
INTRODUCTION

What is family? Are these persons who are related by genetics or marriage or adoption? Or can family be a group of people who choose to consider themselves family? And how does the notion of family influence living situations?

In her book *Building Suburbia: Greenfields and Urban Growth 1820-2000*, Dolores Hayden outlines the history of American suburbs and how they have shaped the “American Dream.” Hayden claims that more Americans live in the Suburbs than anywhere else in the world and idealize the single-family home and private yard located in suburban communities, culminating in what she defines as the “triple dream” (2003, 4-8). Over the last two hundred years, this dream has been shaped and exploited by developers and local government’s support of new development in the form of subsidies (Hayden 2003, 4). Because the United States does not have a national land-use policy, single-family development has largely influenced land planning throughout the country (Hayden 2003, 4). And despite changes in culture, ethnic and racial make-up, and family structure, single-family homes and suburban communities have been resistant to transform and continue to perpetuate antiquated racial, gender, and family roles (Hayden 2003, 13, 14).

Likewise, Katharine Silbaugh argues that we must not interchange the words “family” and “household” in reference to living situations because not all households
consist of relationships formed by birth, marriage or adoption, or what the U.S. Census Bureau considers the definition of “family” (Silbaugh 2017, 1083) (Vespa, Lewis, and Kreider 2013, 2). Even in households, or housing units containing permanent residents, that do contain birth relatives, there is an on-going cycle of expansion and contraction: parents have children, the children grow up, and then they move out (Silbaugh, 2017, 1088). Current zoning laws restrict land-use by household type, severely limiting integration of various sizes and styles of housing types, which disrupts the natural ebb and flow of household demographics. The notion of family and how it impacts living situations is captured eloquently by Silbaugh when she states, “If family and housing are not just occasionally divergent, but instead normally not co-terminus, what do we actually mean when we ask whether housing design meets family needs?” (2017, 1090)

If attainment of the “Triple American Dream” has fed the development of suburban communities throughout modern American history, and zoning laws have been shaped by single-family housing development, what do these single-family houses and suburban communities look like? According to Virginia Savage McAlester, in her book A Field Guide to American Houses, there are only a few variations of the typical American house; floor plans and elevations tend to be very similar, with minor modifications to create distinctive style differences (2013, 23). The majority of American houses are either one or two-story, with few containing levels outside of these options, and consist of three basic components: walls, roofs and architectural details, which combine to create combinations of room-sized unites (Savage McAlester 2013, 24, 26, 35). In concordance with Hayden, McAlester agrees that suburban neighborhoods were originally driven by
the desire for single-family land ownership in a more rural community setting, but still within proximity to an urban core (2013, 63).

Single-family homes and suburban communities have been resistant to change in terms of evolving socioeconomics and demographics, yet many homes manage to adapt over time due to owner preferences and needs. Stewart Brand says,

“Domestic buildings – homes - are the steadiest changers, responding directly to the family’s ideas and annoyances, growth and prospects. The house and its occupants mold to each other twenty-four hours a day, and the building accumulates the record of that intimacy (Brand 1994, 7).

“Fantasy-based change in homes comes in bursts, but except for the elderly, reality-based change is constant and relentless. Babies arrive, become kids, become older kids, leave; dependent aging relatives arrive, dies; money comes, money goes; divorce hovers; careers change; everybody keeps on maturing in their tastes and activities.” (Brand 1994, 159)

As with Silbaugh, Brand argues that domestic life is constantly evolving, and that in most homes, occupants leave permanent traces of their changing needs. Yet, like Hayden, Brand recognizes that while the shape and structures of families have continued to evolve, “the design of housing” has not yet adjusted to current domestic needs (1994, 3). This thesis analyzes changing living situations and needs for updated policy and housing. Existing community and housing policies will also be analyzed with the goal to propose adaptations for changing demographic conditions and living arrangements. The hypothesis of the following investigation is that there is need for local governments to update zoning policies to permit and encourage design of integrated communities and housing, increased density of existing communities, accessibility, and flexibility for future growth and changes in household structure.
WHY ARE LIVING ARRANGEMENTS CHANGING?

The United States appears to be at the verge of a critical transition. In Paul Taylor’s book *The Next America: Boomers, Millennials, and the Looming Generational Showdown*, he outlines two demographic shifts that will have a huge impact on U.S. society: a growing population of non-white citizens and a growing population of aging citizens (2014, 16). Figure 1-1 below depicts the population projections of those over the age of 65 from 2016 through 2060; the number of adults over 65 is expected to increase by over fifty percent, resulting in twenty-five percent of the entire population over the age of 65 by 2060. Figure 1-2 below depicts the population growth by race from 2016 through 2060; the percentage of the population for all races is expected to increase except whites and non-Hispanic whites.

**Figure 1-1** Source: U.S. Census Bureau 2017 National Population Projections

![Growing Aging Population: 2016 - 2060](image)

**Figure 1-2** Source: U.S. Census Bureau, 2017 National Population Projections
Taylor argues that either one of these demographic shifts would be momentous on its own, but the fact that they are happening at the same time is creating a major rift between young and old. Differences in lifestyle, politics, families, or any number of choices can be expected between generations, because two groups of people who came of age in different eras cannot be expected to think and act the same. Additionally, Taylor describes some of the ways households are changing:

“Our neighborhoods have become more integrated by race but more segregated by income. And more sorted by party. Women have become more economically independent, men less. Gender roles are converging, both at work and at home. Marriage is in decline. The nuclear family is losing its pride of place. The fastest growing household type in America contains just one person. Not far behind are multigenerational households, in which two or more adult generations live under the same roof, often because that’s the only way to make ends meet.” (2014, 34)

Figure 1-3 below depicts the changes in households from 1970 to 2017. Today there are fewer married couples with children and married couples without children, but more people living alone, more single parents, and more non-traditional households.
A large proportion of the United States is aging and this group will continue to grow over the years to come; the percentage of non-white Americans also continues to grow. More Americans are living alone, or combining households, and there are more woman-headed households and double-earner households. An aging population, immigration and diversified culture, and changing family dynamics are three of the main reasons living arrangements are changing. While these demographic shifts will have
major impacts on all aspects of U.S. society, this thesis explores what impact they will have on our built environment, specifically housing.

**Aging**

The aging population in the U.S. is growing rapidly due to the Baby Boomer generation, the oldest of which began turning 65 just under ten years ago. The term “Baby Boomer” is used to describe a generation of American citizens who were born after WWII between 1946 and 1964. This period of time is marked by significantly higher birth rates over one of the longest spans time (Colby and Ortman 2014, 2). As of 2011, the oldest of the Baby Boomer generation turned 65 and the number of citizens over the age of 65 will continue to grow through 2029. Not only are a significant share of Americans growing older, older Americans are also living longer than ever before. The old age dependency ratio, which indicates the number of older adults per one hundred working age adults, increased by almost ten percent between 1945 and 2010, and by 2030, this number is expected to increase an additional fourteen percent, for a total of thirty-five older adults to every one hundred working age adults (Colby and Ortman 2014, 9).
Less than ten years ago, the financial support of one person over the age of 65 was shared between five working adults. In ten more years, three working adults will be sharing the financial support of one person over the age of 65 (Figure 1-4). This significant increase in the quantity of older persons and longer life expectancies will have considerable implications on financial resources, healthcare and social programs to help support the aging population, as well as housing.

As indicated by Paul Taylor, the Joint Center for Housing Studies of Harvard University also predicts that the number of single-person older households will continue
to grow by approximately fifteen percent, presenting additional challenges in terms of financial resources and support networks for this age group (2016, 6). Currently, almost half of all households living alone are individuals over the age of 65 (Figure 1-5).

**Figure 1-5** Source: U.S. Census Bureau Current Population Survey 2018

Single households typically have less income than married households and disability and mobility become a greater concern as a single person ages; by 2035, The Joint Center for Housing Studies predicts an increase of households with a disability by seventy-six percent (2016, 8). With fewer financial resources and a greater need for daily assistance, older adults may seek help from family members or hire outside care in order to stay in their homes as long as possible. Housing will also present a challenge – older adults will need to adapt their living situations to support their changing needs. Most older adults live in single-family homes, of which only a fraction provide accessibility features;
likewise, the cost of renovating has the potential to exceed the average householder savings (The Joint Center for Housing Studies 2016, 9). As indicated by the old age dependency ratio, there will be fewer family caregivers as the aging population continues to grow, indicating a need for in-home services or group homes, yet many older adults cannot afford the cost of long-term care (The Joint Center for Housing Studies 2016, 10).

Several factors will contribute to the change in living situations of aging Americans: the sheer volume of individuals in this age group coupled with longer life expectancies will have major implications on availability of housing. Also, with fewer working age adults to support the financial burden of the greater number of older Americans, as well as fewer family caregivers, accessibility and long-term care options will impact housing and community preferences.

Diversified Culture

In 2010, at thirteen percent, the United States boasted its largest population of immigrants since 1910 (Figure 1-6) (Grieco, Et al 2012, 2) (Gibson and Lennon 1999, Table 1).
Immigration is one way for countries to balance low birth rates with a large aging population; an increased number of foreign-born individuals into the working age group can help mitigate the growth of older adults (Taylor 2014, 37). As the U.S. population continues to grow older, immigration will be an important strategy to balance the effects of an aging society. Similarly, as the aging population begins to decrease in the years to come due to their eventual mortality, in combination with births to immigrants and non-white citizens, the U.S. population will continue to become more and more diverse (Ortman, Velkoff, and Howard 2014, 12). Most of the current foreign-born population came from Latin America, particularly Mexico, with a similarly large percentage from Asia (Figure 1-7) (Grieco, Et al 2012, 2).
Figure 1-7 Source: U.S. Census Bureau, American Community Survey, 2010

Foreign-Born Population by Origin

- Africa: 4.0%
- Asia: 28.2%
- Europe: 53.2%
- Latin America and the Caribbean: 12.1%
- North America: 4.0%
- Other: 4.0%

Figure 1-8 Source: 2009 and 2016 American Community Survey

Multigenerational Households by Race: 2009 - 2016

- Total
- Asian
- Hispanic
- Black
- Other
- White
Immigrants bring changes in culture, values, and ways of life. As our society continues to become more and more foreign-born, American values, like certain types of living situations that were once seen as traditional, will also begin to change. For example, multigenerational households are more common between immigrant and non-white families than they are for white families (Figure 1-8) (Joint Center for Housing Studies 2016, 7) (Vespa, Lewis, and Kreider 2013, 7 & 9). Foreign-born households are more likely to make less money and live in poverty and they are also more likely to be married and have children than native-born households (Grieco, Et al 2012, 3 & 13). With higher rates of marriage, children, and multigenerational families, foreign-born households tend to be larger than native-born households (Grieco, Et al 2012, 14). Combining resources between multiple generations and extended families is a way to manage finances and increase standard of living (Landale, Thomas, and Van Hook 2011, 46). Moving forward, living situations will need to accommodate not only changes in family structure and size, but also different cultural norms and preferences.

Changing Family Dynamics

American society is aging, and is more culturally diverse than ever before, and what was once considered the traditional American family, is also changing. In 1960, a “traditional” family was considered two parents in their first marriage with children (Parker, Menasce Horowitz, and Rohal 2015, 15). Since 1970, the number of two-parent households has decreased; over twenty-five percent of all family households are headed by a single parent (Figure 1-9) (Vespa, Lewis, and Kreider 2013, 3 & 5) and twenty-five
percent of children are born to a single mother (Figure 1-9) (Parker, Menasce Horowitz, and Rohal 2015, 15).

**Figure 1-9** Source: U.S. Census Bureau, Current Population Survey 2018, Annual Social and Economic Supplement, selected years, 1970 to 2018

There are also more married couples without children than married couples with children; and there has been a large increase in the number of one-person households (Figure 1-3) (Vespa, Lewis, and Kreider 2013, 5) Additionally, the number of men and women between the ages of 18 and 34 who live in their parents’ home has increased since 2000 (Figure 1-10) (Vespa, Lewis, and Kreider 2013, 11). Paul Taylor also indicates that while adult children are moving in with parents, parents are also moving in with adult children
The Pew Research Center summarizes many of the ways American families are changing,

“Two-parent households are on the decline in the United States as divorce, remarriage and cohabitation are on the rise. And families are smaller now, both due to the growth of single-parent households and the drop in fertility.” (Parker, Menasce Horowitz, and Rohal 2015, 15)

Figures 1-10 and 1-11 below depict the growth of multigenerational households by type from 2012 to 2016, as well as the growth of multigenerational households from 1960 through today. In 1960, the number of multigenerational households began to decline, until 1990; today, one in five households are multigenerational.

**Figure 1-10** Source: U.S. Census Bureau American Community Survey 2012 and 2016
The 2008 Recession also contributed to changes in family life in several ways. The number of stay at home mothers decreased after the recession, as well as the homeownership rate among families with children (Vespa, Lewis, and Kreider 2013, 26 & 27). Many couples delayed having children, reducing fertility rates (Cherlin, Et al 2013, 219). Although there was already a pattern of young adults moving back in with their parents, the 2008 Recession increased the number of married couples who moved in with parents (Cherlin, Et al 2013, 229). Grandparent co-residence also increased during the 2008 Recession; ten percent of children in 2012 lived with grandparents (Unifon, Zoil-Guest, and Kopko 2014, 122).

Family dynamics have changed notably over the last sixty years. Where the typical family used to be two parents with children, today the typical family has diverged...
in two separate directions. There are still many two-parents-with-children families, but
there are also many single-person, single parent, or couples-without-children families.
On the opposite end of the spectrum, families are growing in a multigenerational
capacity. Today’s families not only look different, but they are finding different ways to
manage everyday life. The more people with which housing expenses are shared, the less
burdensome the overall cost of living. Multigenerational living is a cost-effective way for
many families to pay for housing, childcare, and everyday expenses. Housing in the
United States previously catered to one demographic; today housing needs vary widely
between different family structures.

THE DYNAMICS OF SHARED LIVING ARRANGEMENTS

Martin Heidegger and Gaston Bachelard both discuss the concept of home and the
concept of dwelling, the definition of which connotes an intimate connection with one’s
residence. Bachelard argues that one’s experience of home and ability to dwell comes
from one’s past experiences throughout life; thus, how one lives in one’s home is a
unique experience that varies from person to person (1964, 3-7). Similarly, Heidegger
says that dwelling is born from man’s relationship to spaces, and modern houses, though
they provide shelter, do not necessarily guarantee dwelling (1971, 143-145). These
theories suggest, in order to be successful, shared living arrangements need to
accommodate the different past experiences and needs of each resident. Additionally,
Mary Douglas compares the home to an “embryonic community” rather than as a
function of the purpose it serves. She claims that a home will survive as long as it serves
the needs of the “community,” or the people who live within it, but the people who live within the home, must always act for the greater good of the “community” (1991). Shared living arrangements then must also convey a sense of solidarity between residents.

One’s home is an intimate space, one in which the most personal aspects of daily life are carried out. Some shared households are established based on desire to live in such an arrangement and some households are established based on need. Understandably, sharing one’s home, whether by choice or by need, will come with some challenges. Yet, there are benefits to living in a shared household: companionship, support, built-in childcare, shared cost of living and household chores, to name a few.

In a study that reviewed two types of shared living arrangements, those that were functional in nature and those that were contractual in nature, it was determined that familial multigenerational households that were functional in nature, where one resident is caring for another resident, tended to last longer than contractual arrangements, where each resident is expected to contribute equally (Glick and Van Hook 2011). This may suggest that in households where there is more of a need for shared living arrangements, residents are more likely to work to maintain that arrangement; whereas, in situations where residents are choosing to share housing, there is less of an obligation to stay together.

Additionally, individuals in shared living arrangements feel the most comfortable when they feel a sense of control over ownership, the use of space, decision-making, and privacy (Easthope Et al 2015). While shared living arrangements allow residents to pool resources and share household duties, if the household is already strained, shared living can sometimes add additional stress (Muennig, Jiao, and Singer 2018). Shared living
arrangements can be particularly challenging for grandparents who are supporting adult children and grandchildren. If retired, many grandparents may be on a fixed income that is insufficient to support the rest of the household. They may also have a difficult time finding work to supplement existing income. Many grandparents also do not seek legal custody of their grandchildren and are therefore not entitled to many programs parents can receive to help support their children (Baker and Mutchler 2010). Clearly, shared living arrangements are delicate and complicated networks that require balance and compromise from all residents.

Multigenerational Household Defined

Up to this point, this thesis has discussed shared living arrangements, which, for the purpose of this thesis, refers to non-genetic shared living arrangements. Multigenerational households, which typically refer to genetic relationships, were mentioned previously as a means for changing families to supplement traditional family roles. According to the Pew Research Center, there are three types of generational households (Taylor, Et al 2010, 2):

1. One-generation: siblings and couples
2. Two-generation Family: Parent(s) and children under age 25
3. Multi-generation Family:
   a. Two generations: Parents and adult children over the age of 25.
   b. Three generations: Parents, adult children, and grandchildren
c. Skipped generation: Grandparents and grandchildren

d. More than three generations

The United States Census Bureau also defines three types of generational households; however, each type includes three or more generations (Lofquist 2012). This thesis will focus on shared living arrangements, large and small; therefore, this thesis will follow the definition of generational households established by the Pew Research Center. However, this thesis will refer to genetic living situations as multigenerational and non-genetic living arrangements as shared. As outlined in the previous section, it is important to reiterate that there may be additional stresses or obligations connected with multigenerational living arrangements, then there are with non-genetic shared living arrangements, due to the nature of formation of the household.

Multigenerational households were the norm until approximately the twentieth century when suburbs, minimal immigration, and longer life expectancies coupled with stronger finances of those over age 65 and social security encouraged separate living situations (Figure 1-11) (Taylor, Et al 2010, 4). Several factors have influenced the resurgence of multigenerational households, including marriage later in life, immigration, and the 2008 Recession (Taylor, Et al 2010, 5). As indicated in previous sections, older adults, young adults, and racial and ethnic groups are more likely to live in multigenerational households (Taylor, Et al 2010, 5-8). Financial stress and health issues are likely the two biggest reasons for why these groups are choosing multigenerational housing. Resources and responsibilities can be shared, and care giving can be provided much more easily and cost-effectively in a multigenerational household.
Why Choose Shared Living Arrangements?

As outlined previously, there can be many reasons to choose shared living arrangements: financial stress, affordable care giving or assistance with everyday tasks, companionship, changes in relationship status or unexpected life events. In terms of multigenerational households, reasons for shared living ultimately break down into two main categories: exchange and altruism (Keene and Batson 2010, 644). Family members will provide living arrangements or assistance in exchange for something else, or family members opt to help their kin without any expectation of reciprocation. For example, a grandmother may allow her adult grandson to live with her in exchange for assistance with household maintenance.

In a study that analyzed zoning applications of homeowners requesting to add a secondary suite to their single-family property, four main reasons were established. Families wanted to establish proximity while maintaining a level of independence, provide care or assistance to an aging or disabled family member, share resources and responsibility, or establish social networks (Goodbrand, Humphrey, and Gondek 2017, 536). Although these reasons were provided regarding secondary suites, they could be applied to all multigenerational living situations. Family can be an important means of support in times of need, and changes in household structure can happen often and rapidly (Pilkauskas 2012, 941). Current housing and community structure that has been established based on nuclear family norms makes it difficult for families to adapt their living situations to easily provide support to one another within close proximity. Single-
family homes were originally designed for a single family, parents and children; so the addition of relatives and multiple generations to a household can add strain to limited resources. Similarly, if all of the houses in a neighborhood are designed for a single family rather than a variety of household structures, it is difficult for family members to maintain independence but still live in proximity if adjacent housing does not meet the specific needs of each user.
In the previous chapter, it was established that living arrangements in the United States are changing due to a large aging population, diversified culture, and changing family dynamics. The reasons why Americans are choosing shared living arrangements, despite their complexity, fragility, and propensity for rapid change were also discussed. The intent of this chapter is to review existing proposals for change and the rules that govern housing and how they impact multigenerational and shared living situations. A significant quantity of research has analyzed policy and housing design in terms of changing living arrangements, providing varied insights and suggestions for change. However, the need for diverse forms of housing in an integrated community setting with accessible access to community resources is a common theme.

Although the single-family home in the suburban community has been idealized as the attainment of the American Dream and will be the focus of this thesis, it is important to note that the suburbs may not be the first choice for some when it comes to location of household. The lifecycle approach dictates that specific housing needs, and therefore housing selection, will vary depending on the lifecycle stage; lifecycle stage can be broken down into three phases: younger households without children, households with
children, and older households without children (Estiri, Krause, and Heris 2015, 778). One-person, young unmarried, and young married households are more likely to live in cities over the suburbs due to proximity of jobs and resources, and where housing options are more varied and flexible (Jung and Yang 2016, 13) (Estiri, Krause, and Heris 2015, 780). Families with children tend to prefer suburbs where housing sizes are larger and there is a greater proximity to schools (Estiri, Krause, and Heris 2015, 781 & 789). For households without children and further along in the lifecycle stages, housing size and mobility are not as critical, but personal preferences in terms of neighborhood and resources are; therefore, housing location can be varied (Estiri, Krause, and Heris 2015, 781 & 789).

In addition to geographical location, the make-up of communities may impact choices in living situations. For many immigrant families who live in multigenerational households, it may be more practical to live close to a city center where employment opportunities and community amenities are abundant; perhaps the suburbs portray a sense of outdated American ideals that do not align with those of multigenerational immigrant families, or maybe there is already an established network of extended family and peers located in a city center (Jung and Yang 2016, 9 & 13). Racial structure of a community may also be a factor in selection of living situation; selecting a neighborhood with a similar racial and cultural background is important to some (Jung and Yang 2016, 14).

COMMUNITY: POLICIES AND PROPOSALS

Research analyzing policy and design in terms of changing living arrangements
typically focuses on community and housing options. Three proposals outlined below suggest that communities that encourage engagement of their residents, provide a variety of housing sizes and types within close proximity, and incorporate accessibility in terms of the community as a whole, in addition to local resources, are the most advantageous for shared living and multigenerational households. Additionally, revitalization and densification of existing neighborhoods and communities is a more sustainable approach to providing housing for multigenerational and shared households, rather than continuing to build new communities.

The Community for All Ages is an initiative that seeks to “intentionally engage people of all ages in civic and community life and include quality supports and environmental design for all ages.” (Brown and Henkin 2014, 63) This initiative can be applied to existing communities or new, and has four overall goals: connect community resources and organizations, engage residents of all ages in community roles, promote interaction between people of all ages, and create communities that address space from a lifespan perspective (Brown and Henkin 2014, 65). In communities that have implemented this initiative, the biggest challenges included establishing policy that connected with residents from different generations, finding “common ground” between residents of different age groups and backgrounds, and the logistics and the time investment required to make significant changes (Brown and Henkin 2014, 67).

Land-use policies that separate residential areas from commercial areas, as well as the single-family home designed around the post-war nuclear family, shape much of the American landscape (Micklow and Warner 2014, 1-2). As the population continues to grow and grow older, the demand for housing will increase. Developers, along with
government entities who support growth, may see this as an opportunity to build new communities, arguing that new growth creates jobs and encourages economic growth (Hayden 2003, 232). Yet, others argue that time and money should be spent revitalizing and densifying existing communities. Existing communities contain existing transportation, infrastructure, and social networks, whereas new communities are a blank slate (Hayden 2003, 234). In order to modify communities to adapt to changing household structure and living situations, zoning laws and land-use policies must also change, including greater integration of housing types and sizes in conjunction with commercial and community resources (Micklow and Warner 2014, 7). Other recommendations for adapting communities for changing households include permitting accessory dwelling units to help densify existing communities, retrofitting existing housing structures into multi-family units, changing the definition of family within local codes and ordinances, and implementing incentives, such as impact fees, to motivate developers to provide additional community resources (Hayden 2003, 236-238) (Micklow and Warner 2014, 8 & 9).

Disability and mobility limitations can affect people of all ages and in any stage of life, yet as our population continues to grow older, these issues will become an even more important factor in housing and community design. Regulations that dictate inclusive design or accessibility requirements are rarely required for single-family housing, but this is essential for the sustainability of communities (Malloy 2017, 204). Individual homeowners are free to modify their residence as needed, but if accessible design was regulated at a national level and required of all homebuilders and developers, similar to commercial construction, homes would have the same features across the
country, which would allow those with disabilities to move wherever they preferred (Malloy 2017, 207-208). Additionally, inclusive design of the home does little to aid those with disabilities and limited mobility if the community does not also provide accessible access to resources and local amenities; therefore, it is critical for inclusive design to also be factored into land use and planning (Malloy 2017, 208). Two concerns regarding this approach are that accessibility requirements may initially drive up the cost of new homes, and some may argue that government entities should not have this much control over property rights (Malloy 2017, 210). Just as with the Community for All Ages initiative, communities incorporating inclusive design will ultimately facilitate engagement of all residents by catering to individuals of all ages, providing various means of transport and forms of accessible design, as well as facilitating seamless connection to other jurisdictions (Malloy 2017, 214).

New communities would certainly provide easier opportunities for housing variations and the ability to regulate accessibility and accessible connection to local resources compared with existing ones. But if engagement with one’s community is important to support residents of all ages, an existing community with established social networks may be more effective. Likewise, the cost implications of building a new community, which would require new infrastructure, resources, schools, and local regulation, is less efficient than taking advantage of existing communities that already contain these assets.
Research on housing that supports changing living arrangements in terms of design and policy has focused primarily on adapting existing housing units. Variations include flexible housing, shared housing, accessory dwelling units, micro units, multi-family housing and co-living. Three proposals outlined below suggest that housing costs and care giving are two reasons why many residents choose living options other than the typical single-family home, or choose to modify the single-family home to accommodate various living arrangements. Additionally, the following proposals suggest that housing policy can have strict definitions of what kind of family can live in single-family homes and does not always allow for necessary life cycle evolution or encourage varied forms of housing in close proximity.

Accessory dwelling units (ADUs) are one strategy implemented to provide more flexibility in a single-family home and densify existing neighborhoods. These are typically smaller, separate living units on the same lot as a larger, single-family home; zoning codes typically require homeowners to be the occupants of either the main house or the ADU, and also limit the size of the unit to maintain the principality of the original home (Chapman and Howe 2001, 637) (Liebig, Keonig, and Pynoos 2006, 162-163). Some zoning codes also limit the number of non-family members who may occupy both units, the quantity of ADUs permitted on the lot, parking requirements, and designated entry requirements (Chapman and Howe 2001, 642). Typical concerns regarding ADUs include lack of privacy and noise control, increased traffic and parked cars within the neighborhood, decreased housing value, and disrupting the character of the overall
neighborhood (Chapman and Howe 2001, 647-648) (166). Yet, ADUs are a viable option for both young and old residents looking for affordable housing, and if designed and constructed well, can be considered an improvement to existing housing structures (Chapman and Howe 2001, 648-649). If ADUs are not permitted by a local jurisdiction, three ways to get around restrictions include variances, non-conforming uses, and conditional uses, which either grandfather an existing structure into legal status or allow construction of a new structure even if not typically permitted; however, all of these options require approval by the local authority (Liebig, Keonig, and Pynoos 2006, 164). Modifying definitions of family and who may live in residential structures, along with accelerating the permit review process and reducing the cost of obtaining a permit are several ways local government can facilitate the growth of ADUs (Liebig, Keonig, and Pynoos 2006, 168). For example, if a zoning code specifies that a private residence may contain no more than one unrelated individual, and a homeowner wishes to build an ADU and rent out the primary residence to young professionals, he may be denied the request to do so because more than one unrelated individual would be living on the same property.

In addition to ADUs, shared living and match programs, micro-units, and multi-family housing are also alternatives to multigenerational or alternative living situations. Shared living and match programs promote communal living as a means to cut housing costs and share resources; however, zoning codes dictating how many unrelated individuals may live in a home limit this option (Liebig, Keonig, and Pynoos 2006, 162). Micro-units, which are similar to ADUs in function, but typically the smallest footprint allowed by building codes and sometimes located in denser areas, are another alternative
housing option (Infranca 2014). These units cater to single households and those seeking the most affordable housing options, yet despite the increase in single households over the last several years, financing can be difficult for many developers (Infranca 2014, 84). As stated above, the cost of permitting in conjunction with construction costs and building and zoning codes that regulate the minimum size of houses are also prohibitive (Infranca 2014, 85-86). Criticisms of micro-units reflect those of ADUs, and some also fear they will attract temporary residents who are not invested in the larger community (Infranca 2014, 87). Demand for multi-family units had declined until the 2008 Recession, when the need for more affordable housing due to unemployment and lower incomes drove up demand (Rappaport 2015, 45-46). Previously, older households looking for affordability and less maintenance drove the construction of multi-family units, but as both life expectancy and health of older adults improves, there has been less demand from this age group (Rappaport 2015, 50).

Stewart Brand outlines six functions of a building: site, structure, skin, services, space plan, and stuff; and that they key to an adaptive house is allowing flexibility and independence of each of these functions (Brand 1994, 20). He also emphasizes the need for smaller buildings, which are more affordable and allow for future growth (Brand 1994, 155) but that smaller houses do not allow for enough of a profit margin to entice development (Brand 1994, 201). One housing type that Brand says has adapted incredibly well is the Victorian style house because they were easy to divide into separate units:

“The rooms are modest in size (averaging twelve by twelve feet) and unspecialized by function. Each is lit and ventilated with it’s own windows, each had access to the corridor, each is capable of opening into adjoining rooms (Brand 1994, 193).”
The principles used to design Victorian style homes (similar sized rooms, generic functions, good ventilation and lighting, room-to-room connection as well as corridor access) can be used as a precedent for future housing, in addition to other historical models that have worked well in terms of long-term adaptation. Similarly, housing must ultimately allow for future growth and reduction of residents, provide universal accessibility features, and accommodate proximity in combination with privacy (Silbaugh 2017, 1091-1100).
YORK TOWNSHIP, PENNSYLVANIA: A CASE STUDY

Although there are many different types of housing in many different types of communities, from multi-family housing in cities to single housing units in rural country settings, the focus of this thesis will be adaptations to single-family homes in what Virginia Savage McAlester has labelled “Post-Suburban” communities. In her book, *A Field Guide to American Houses*, Virgina Savage McAlester defines several types of communities that vary based on the time period they were developed and the technology and transportation by which they were established. Post-Suburban neighborhoods were established beginning in 1970 and continue to be developed today; these neighborhoods are defined by small subdivisions scattered in rural areas, large lots and houses, curvilinear blocks and cul-de-sacs, similar sized and priced housing, and big-box shopping that is typically not nearby (McAlester 2013, 70-73).

According to the U.S. Census Bureau’s “2017 Characteristics of New Housing,” which provides data not only on new housing, but also housing dating back to 1973, the average size single-family home built today is approximately 2,600 square feet, has three or more bathrooms, four or more bedrooms, is two-stories, has a two-car garage, laundry on the first floor, and has an approximate lot size of 10,000 square feet. For comparison purposes, in 1973, the average size house was approximately 1,700 square feet, had one
and a half bathrooms, three bedrooms, and a two-car garage. For the purpose of this thesis, today’s housing sizes will be used as the basis of this analysis. As established in the previous chapter, smaller houses have more room for future growth and are more affordable; therefore, to meet the needs of different household sizes and structure, ideal housing design would start with plans less than 2,600 square feet, but permit growth up to 2,600 square feet, creating a baseline by which housing can be modified.

In chapter one, several types of shared and multigenerational households were defined: singles, roommates, couples, single parents, co-parents, and three-generation households. It was also established that the reasons individuals choose shared or multigenerational living situations are often tied to economics, aging, or need for support with everyday tasks. Therefore, it can be argued that the population choosing shared or multigenerational living situations and that require changes within their home in order to do so, do not live in large houses with a significant quantity of extra space to spare or financial means for private care. This thesis also assumes the target audience owns a home and has some financial means to make modest modifications but may not be able to financially support a family member outside of their home; more specifically, individuals who would fall into the middle-income category. According to the Pew Research Center, the middle income is defined as those whose household income is two-thirds to double the national median household income; fifty percent of the population is considered middle income (Kochhar, Fry, and Rohal 2015, 2 & 7). For reference, the U.S. Census Bureau’s American Community Survey five-year summary from 2013 to 2017 reports the median home value in the U.S. to be just under $200,000 and the median household income to be just under $60,000 (QuickFacts United States). Therefore, middle income
would include households earning $40,000 a year to $120,000 a year. For a house that costs $200,000, assuming a thirty-year loan, a five percent down payment, and a four percent interest rate, a mortgage would cost a minimum of $1,000 a month, not including insurance and taxes. After income taxes, this mortgage would be at least a third of the total monthly income for a household in the lowest middle-income range and about fifteen percent of the total monthly income for a household in the highest middle-income range. The cost of a mortgage combined with utilities and everyday expenses would make private nursing home care, estimated to be an average of $8,000 a month, unattainable for individuals in this middle-income bracket (Nursing Home Costs). Similarly, at an average cost of $200 per week per child, or $800 a month, childcare also presents a financial challenge for many families in this middle-income range (Care.com).

This thesis will evaluate the zoning code and permit requirements of the municipality in which the author practices architecture: York Township, York, Pennsylvania. York Township is a subdivision of York County, Pennsylvania, located in South Central Pennsylvania, approximately fifty miles North of Baltimore, Maryland. According to the township website, as of May 2018, the population is approximately 28,000, the median age is 42.2, the percent of the population over 65 is nineteen, the median home value is $193,000, and the median income is approximately $60,000 (York Township). Compared with national averages, York Township falls within the national median housing and income values. Similarly, many of the neighborhoods within York Township would be considered Post-Suburban housing – isolated from shopping districts and separate neighborhoods with houses built after 1970.
THE RULES THAT GOVERN HOUSING

In order to maintain the health, safety, and welfare of their citizens, in addition to preserving land and managing community growth, governing bodies establish guidelines by which builders, developers, and residents must abide. Building codes regulate the construction or renovation of new and existing buildings while ensuring the safety and accessibility of occupants and first responders. Building codes are mostly regulated at the state level, but local jurisdictions can be permitted to make amendments, typically only if changes provide more stringent requirements. While the stringency of building codes may vary from state to state, the use and occupancy of buildings, which sets the stage for all other code requirements, are fairly standard regardless of location. A school in Pennsylvania will have the same function as a school in California, and therefore the same risks in terms of health, safety, and welfare, which is why the general concepts within building codes are similar regardless of location.

Similarly, zoning laws have the same over-arching goals no matter the location: regulate land use and future growth at a local level. However, because zoning laws are regulated at a local level, they can vary widely from community to community. Each community is unique, with different needs and issues; therefore, zoning laws require an intimate knowledge of the community and the ability to adapt accordingly.

In most cases, when modifying an existing property, the owner will need to review the local municipality’s zoning ordinance to ensure compliance, as well as the adopted building code. The owner will also need to seek review and approval from their local jurisdiction in the form of a permit and inspection. While these rules create a
uniform baseline by which all residents, building owners, and developers must abide, they can affect the adaptation of housing for shared or multigenerational households. The following section will review an example of a local zoning code and the associated building codes to analyze how shared or multigenerational households may be affected in terms of the rules that govern housing.

**Zoning Codes**

A local jurisdiction’s zoning codes and permit requirements are usually the first step in determining what can be modified, built, or developed on a piece of property, and will vary from community to community. The most recent version of the York Township Zoning Ordinance was adopted in 2012 and amended in 2017. According to the York Township Zoning Ordinance, its purpose includes five overall goals: to promote general health, safety, and welfare of its citizens; to prevent overcrowding, damage, and danger; to preserve agricultural land; to provide a variety of housing types; and to facilitate community growth. The ordinance is broken up into chapters, or articles, with topics ranging from administration, signs, off-street parking, general and specific regulations, zoning districts, references, definitions, and an appendix.

The first step in determining what can be built or developed on a property is to determine in which zoning district the land is located. Article 3 outlines the designation of zoning districts, which include four categories: Residential, Mixed Use, Commercial, and Industrial (York Township Zoning Ordinance 2017, 7). The Zoning Map of York Township is depicted in Figure 3-1; this map is also part of the zoning ordinance and
outlines the boundaries of the different districts.

Figure 3-1 Zoning Map of York Township depicting the different zoning districts -

<table>
<thead>
<tr>
<th>Low Density Residential</th>
<th>Commercial Shopping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medium Density Residential</td>
<td>Commercial Office</td>
</tr>
<tr>
<td>High Density Residential</td>
<td>Commercial Industrial</td>
</tr>
<tr>
<td>Residential Agricultural</td>
<td>Industrial</td>
</tr>
<tr>
<td>Mixed Residential - Commercial</td>
<td></td>
</tr>
</tbody>
</table>

Within the residential category, there are five different types of housing areas:
Low Density, Medium Density, High Density, Residential Agricultural, and Mixed Residential - Commercial; and each residential district includes different requirements for the number of dwelling units allowed per acre, in addition to set backs, building height
restrictions, minimum lot size, and permitted uses. For example, Low Density Residential areas are limited to a maximum of three residential units per acre, whereas Medium Density Residential Areas are limited to a maximum of five residential units per acre, and High Density Residential areas are limited to a maximum of nine residential units per acre (York Township Zoning Ordinance 2017, 9,12, &15). In the zoning map depicted in Figure 3-1, the three residential districts outlined above are depicted in the beige, yellow, and orange colors, respectively. Residential Agricultural areas permit housing, but they are outside of the Urban Growth Boundary, and intended more for agricultural land preservation and therefore, will not be included in this analysis.

Segregated residential districts do little to aid changes in the lifecycle or the natural expansion and contraction of households. York Township is no exception to the number of communities within the United States that practice this separation. As indicated in Figure 3-1, York Township is separated into different zoning districts, the limits of which follow property lines or major boundaries, but overall appear to be located randomly. Neighborhoods appear to only be connected by roadways. Commercial shopping districts, shown in red, appear to be dispersed throughout the township; however, there is no guarantee that these particular areas contain resources necessary to support the surrounding residential communities. These areas simply permit commercial shopping uses, but do not incentivize or dictate the development of certain resources. Although they would be required to obtain approval from the zoning board, a developer would be permitted to select any of the commercial shopping areas for development, based on whatever is the most advantageous to the developer.

Setbacks and percentage of development restrictions also limit modifications to
existing lots. For example, in a Low-density residential area, the minimum net lot area is 11,500 square feet, the maximum lot coverage is thirty percent, the front and back yard setback is twenty-five feet and side yards are fifteen feet (York Township Zoning Ordinance 2017, 10 & 11). If a homeowner in a Low-density residential area wanted to add an accessory dwelling unit to their property, and their principal residence as well as any other accessory units, like a shed, occupied more than thirty percent of the net lot area, they may be denied their request to add an accessory unit or have to seek a special variance. On a lot that has a net square footage of 11,500 square feet, thirty percent is just less than 3,500 buildable square feet. However, the benefit to setbacks is they maintain a level of safety by requiring separation – if a structure caught fire it has less opportunity to spread if adjacent structures are farther away.

Once a zoning district is established, and the limitations of that particular district have been evaluated, the remainder of the zoning code must be reviewed by the owner for additional development restrictions. These restrictions can include building separation requirements, parking limitations, restrictions on the type of accessory structure permitted, minimum habitable unit size, or anything a local jurisdiction feels is critical to regulating land-use and maintaining the community. In the York Township Zoning Ordinance General Regulations section, several additional requirements are outlined. First, the ordinance dictates a minimum separation distance between a principal structure and any accessory structures (2017, 42). Although these restrictions are often specified for safety, (in the event of a fire, they can help limit the spread of flames) along with maximum lot coverage, they also contribute to the limitations of overall lot development. Second, the zoning ordinance dictates minimum habitable floor area for all dwelling units.
and building structures, accessory units, apartments, and one-person living units. General dwelling units must be at least 700 square feet; apartments and accessory units must be 400 square feet, unless they are specifically intended for only person, in which case they are permitted to be 300 square feet (York Township Zoning Ordinance 2017, 47). For a standard accessory dwelling unit at 400 square feet, the minimum building dimensions would be twenty feet by twenty feet, which is a significant footprint to contribute to the overall lot coverage. Additionally, regulations on minimum square footages may be financially limiting for many homeowners who wish to add an accessory dwelling unit and there may be many occupants who would live in less space for less rent.

The Specific Regulations section of the York Township Zoning Ordinance provides more detailed requirements of single-bedroom accessory dwelling units, in addition to minimum habitable areas. First, only one unit is permitted on a single-family detached dwelling lot, the owner of the lot must occupy either the principal dwelling or the accessory unit, and one off-street parking space, in addition to the two minimum required for a single-family detached home, must be provided (York Township Zoning Ordinance 2017, 58). While the requirement of the owner to be present on-site ensures that someone who has a financial investment in the lot will maintain the property, the other requirements limit the amount of modifications a homeowner can make to their property: if an owner already has an accessory unit within the principal dwelling, they cannot add a second one separate from the principal dwelling. Likewise, the parking requirements cut down on the amount of buildable area, although they help to limit the number of extra vehicles that may end up parked on the main street.

The last step in determining what can be modified, built, or developed on a
property is to determine the specific permit requirements and approval process. In York Township, an owner would need to submit a zoning or building permit application, along with the applicable fee, to the Township for review and approval (York Township Zoning Ordinance 2017, Article 10). The benefit of the permit review process is that it requires any new buildings, and future building owners who wish to make changes to the original structure, have their proposed changes reviewed by the authority having jurisdiction, ensuring all updates will be code compliant. The downside to multigenerational and shared households is that permits will require extra time for review, extra cost to ensure work is performed to code, and sometimes alert the authority having jurisdiction of living situations that may not be in accordance with local zoning regulations. Owners also can appeal to the Zoning Hearing Board in the event of a denial of request, or if they wish to develop a structure that is not typically permitted on a specific property (York Township Zoning Ordinance 2017, Article 10). These regulations permit some flexibility and give owners the opportunity to argue for their specific case, but the process can take a long time and approval is ultimately left to the discretion of whoever is on the board.

To that end, definitions outlined within the zoning code are also left to the interpretation of the zoning official and hearing board. According to the York Township Zoning Ordinance, a Dwelling Unit is defined as, “One or more rooms used for living and sleeping purposes and having cooking, sleeping and sanitary facilities and arranged for occupancy by not more than one family (2017, 162).” It is not explicitly clear what “arranged for occupancy by not more than one family” means in regard to the building code; if a house has multiples of each of the spaces above, perhaps it means more than one family can use it. Likewise, a Single-Family Detached Dwelling is defined as, “a
freestanding building containing one dwelling unit used by one household which is surrounded by open space or yards (2017, 162).” A similar question can be asked about the term “household.” Neither family, nor household are defined within the zoning code; the intent may be to allow a building owner some flexibility and the ability to make an argument toward their preferred definition, but it also allows the reviewer to override any argument based on their own personal interpretation.

It should also be noted that the York Township Zoning Ordinance does not directly address accessibility requirements, connections to neighboring townships or communities, or engagement of its citizens. Article 2 provides reference to a comprehensive plan and sustainable community plan that was updated in 2014 (York Township Zoning Ordinance 2017, 5). This comprehensive plan compares existing township demographics with estimated future growth patterns and overall community vision. While the comprehensive plan lightly addresses the need for barrier free housing, pedestrian-friendly transportation connections, and varied housing to support different socio-economic needs, it does so within the existing confines of the current zoning strategy and does not specifically address how these should be accomplished or provide mandates requiring their consideration in new development (2014 York Township Comprehensive Report). It is also unclear as to how zoning ordinance and comprehensive plan are connected.

Although rules set forth within zoning codes are established to regulate land-use and protect the residents within the community, they limit the adaptation of single-family housing for alternative living situations by separating zoning uses and segregating housing sizes, by not dictating development of specific commercial uses or providing
incentives for broader development, by limiting the amount of development permitted on a residential property, as well as the number of accessory units, and by allowing definitions to be left to interpretation. These limitations ultimately guide design and development down a very specific path with little room for alternative options.

**Building Codes**

Once an owner has evaluated the zoning code and necessary requirements outlined within, the next step is to assess any proposed modifications, buildings, or development in terms of the applicable building codes. The following section will evaluate the building code requirements of York Township regarding how adaptations for shared or multigenerational households may be affected.

York Township has adopted the Uniform Construction Code, which is a Pennsylvania statewide building code adopted by ninety percent of local municipalities (Pennsylvania Department of Labor and Industry). The 2015 International Code Council established the applicable building codes currently enforced under the Uniform Construction Code, except for the National Electric Code (Pennsylvania Department of Labor and Industry). Within the International Code Council, the *International Building Code* (IBC), *International Existing Building Code* (IEBC), and *International Residential Code* (IRC) are the three main codes that would have the greatest impact on building use and occupancy in terms of shared or multigenerational living arrangements. The type of project proposed will ultimately dictate which code should be referenced. Renovations to an existing building would start with the IEBC but will typically be directed to the IRC or
the IBC. New residential projects will either fall under the IRC or the IBC.

According to Chapter One: Scope and Administration, the IRC is intended to apply to “One- and two-family dwellings and townhouses not more than three stories above grade plane in height with a separate means of egress and their accessory structures not more than three stories above grade plane in height (2015 International Residential Code).”

Figure 3-2 One- and two-family dwellings per the 2015 International Residential Code – Sketch interpretation by author

According to its Chapter One: Scope and Administration, the IBC applies to “every building or structure” and any associated structures (2015 International Building Code, 1-2). Therefore, if a project were related to a one- or two-family dwelling unit, it would be evaluated under the IRC, and if a project were related to something outside of that scope, it would be evaluated under the IBC. In Chapter 3, the IBC further defines residential structures in terms of specific uses; sections 310.3 through 310.6 outline four types of residential structures:
R1: contains sleeping units where residents stay for less than thirty days. These include transient boarding houses and congregate living facilities with more than ten occupants, hotels, motels and any structures of a similar nature (Figure 3-3) (2105 International Building Code and Commentary).

Figure 3-3 R1 transient sleeping units with more than ten occupants - Diagram by author

R2: contains sleeping units or more than two dwelling units where residents are typically permanent. These include apartment buildings, non-transient boarding houses and congregate living facilities with more than sixteen occupants, convents, dormitories, fraternities, sororities, non-transient hotels and motels, live/work units, monasteries, vacation time-share properties, and any structures of a similar nature (Figure 3-4) (2105 International Building Code and Commentary).
**Figure 3-4** R2 sleeping or dwelling units with more than sixteen permanent residents - Diagram by author

R3: not categorized by R1, R2 or R4, and where residents are typically permanent. These include buildings that do not contain more than two dwellings, non-transient boarding houses and congregate living facilities with sixteen or fewer occupants, transient boarding houses and congregate living facilities with ten or fewer occupants, care facilities with five or fewer individuals receiving care, lodging houses with five or fewer guest rooms, and any structures of a similar nature. Two exceptions to this are when a care facility as defined in R3 has a sprinkler system, it may be classified under the IRC, and when a lodging house, as defined in R3, is owner occupied, it may be classified under the IRC (Figure 3-5) (2105 International Building Code and Commentary, 3-39-41).
Figure 3-5 R3 no more than two dwellings, small group living facilities, and small transient lodging houses - Diagram by author

R4: Contains “more than five but not more than 16 persons, excluding staff, who reside on a twenty-four-hour basis in a supervised residential environment and receive custodial care (Figure 3-6) (2105 International Building Code and Commentary, 3-41-42).”

Figure 3-6 R4 Small-scale long-term care facility - Diagram by author

Therefore, based on the residential options outlined within the IRC and the IBC, single-family adaptations for shared or multigenerational living arrangements are most likely going to be defined under the 2015 IRC or as an R3 under the 2015 IBC.
Building codes protect the health, safety, and welfare of all occupants, in addition to first responders in the event of an emergency. The main reason there are separate codes for residential structures and commercial structures is safety. If we consider the nature of the occupants in a typical home, most individuals, except for small children and older adults, are familiar with their home, and are of the physical and mental capacity to safely exit in the event of an emergency. Most commercial structures consist of a much larger number of occupants, and occupants who may be unfamiliar with their surroundings, or are not of a physical or mental capacity to exit safely on their own. Besides building use and occupancy classification, the 2015 IRC and 2015 IBC are also different in that the 2015 IBC typically has more regulations and requirements by which a building design must abide, including accessibility, fire protection and egress, and maximum and minimum square footage.

For example, the 2015 IBC requires all buildings comply with some form of accessibility guidelines to ensure that visitors of any level of physical ability can access a building and its amenities. Typically, these requirements are outlined in Chapter 11 of the IBC, but many states and local municipalities will also reference the 2010 Americans with Disabilities Act Standards for Accessible Design, or the International Code Council’s A117.1 Accessible and Usable Buildings and Facilities. These guidelines dictate anything from the required clearances at doors for wheelchair access, to headroom protection underneath stairways, the size of bathrooms and required accessories like grab-bars, as well as a required number of accessible entrances. The 2015 IRC does not require adherence to accessibility guidelines. While accessibility guidelines can potentially increase the cost of a project and can complicate a simple design, they make buildings
universally accessible and allow individuals with physical limitations to easily get around. If the 2015 IRC were to require some adherence to accessibility guidelines, it would allow housing to have a much broader reach to potential occupants without requiring great personal expense for retrofitting.

Additionally, based on use and occupancy classification, the 2015 IBC regulates everything from building height limitations to type of construction, which then leads to specific fire protection systems and egress requirements. Chapters 7 through 9 of the 2015 IBC dictate the required fire rating of certain building components based on use and occupancy, like walls or interior finishes, and they specify what extent of fire protection features, like sprinkler systems, are required within a structure. Chapter 10 of the 2015 IBC is dedicated solely to egress requirements, including maximum length of egress pathways; number of required exits and their sizes; stairways, ramps, corridors, and their associated components, like handrails. The 2015 IRC lightly touches on each of these subjects, but in no way to the extent that is required for commercial buildings. As single-family homes are modified for shared or mutigenerational living arrangements, they may be required to comply with commercial building codes rather than residential codes, due to the nature of the modification. These requirements can make adjustments more complicated in terms of construction, as well as overall feasibility, and will have cost impacts too.

Finally, when residential units are designed under the 2015 IBC, they are susceptible to maximum and minimum square footage requirements, not typically outlined in the 2015 IRC. Chapter 10 of the 2015 IBC, which outlines egress requirements, dictates a maximum floor area allowance per occupant of 200 gross square
feet (2015 International Building Code, 10-12). In commercial structures, this limitation supports safe egress in the event of an emergency. As with accessibility codes, the 2015 IRC does not have a limitation of building occupants; perhaps because there is a preconceived notion that a “single-family” home would be limited to a single “family” as historically defined: father, mother, and children. Multigenerational and shared households benefit from this lack of restriction in that it allows for flexibility in how many individuals may occupy a home. Yet, what if an extremely large extended family moved into a home? This might have major implications on the egress capacity, on the structural integrity of the home, or the volume of wastewater produced and the capacity of the home’s plumbing system, as well as the capacity of the electrical system.

Likewise, in Chapter 12 of the 2015 IBC, minimum requirements in terms of square footage of habitable space are also outlined. Dwelling units are required to have at least one room that is at least 120 square feet and all other habitable spaces must be at least 70 square feet. Efficiency units are required to be no less than 220 square feet including a separate bathroom. While these regulations ensure that dwelling units are suitable for living, they also establish a minimum baseline that may be financially infeasible or limiting to someone looking to build an efficiency or accessory unit. There also may be occupants willing to live in smaller spaces in exchange for lower cost of living.

As with zoning codes, the interpretation of building codes is left to the discretion of architects and engineers, as well as the code official and authority having jurisdiction. Again, one could argue that interpretation allows for fluidity and flexibility within the building codes; however, a lack of clear definitions could limit potential options based on
who is reviewing a specific project. Under the 2015 IRC and 2015 IBC, in Chapter 2 Definitions, a dwelling is defined as, “any building that contains one or two dwelling units used, intended, or designed to be built, used, rented, leased, let or hired out to be occupied, or that are occupied for living purposes,” and a dwelling unit is defined as, “a single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.” While these definitions tell us how many living units can exist in a structure, and for what purpose they may be used, they do not define who may use them or how many persons can occupy a single dwelling unit, unless defined under the IBC and the minimum square footage requirements. Similarly, while the 2015 IRC specifies jurisdiction over one- and two-family dwellings, neither the 2015 IRC nor the 2015 IBC define what is meant by one-family or two-family. As mentioned previously, the term family could have a wide range of meaning, which could be beneficial to shared and multigenerational households in terms of flexibility, but these terms left undefined are susceptible to varied interpretation.

Likewise, as with the concept of family, the concept of a dwelling unit is fairly vague, and much can be left to interpretation regarding what kind of spaces make up a dwelling unit or how one would know if they are sufficient for one family or multiple. As outlined above, the 2015 IRC and the 2015 IBC define a dwelling unit as, “a single unit providing complete independent living facilities for one or more persons, including permanent provisions for living, sleeping, eating, cooking and sanitation.” So, the 2015 IBC says a dwelling unit is “a single unit,” but does this mean one room, one apartment, one house, or any of the above as long as the quantity is one? The 2015 IRC and 2015
IBC also say that a dwelling unit must provide space for eating, cooking, living, sleeping, and sanitation; which would mean a dwelling unit would need a kitchen area, a place for a table, a place for a couch, a place for a bed, and at least one bathroom; but what about houses with multiple kitchens, dining areas, living areas, bedrooms, and bathrooms? If there is one roof, or one main entrance, is this still considered one dwelling unit? Again, one might argue that the vagueness of the definition allows for more flexibility, but it could also prevent the same flexibility based on preconceived notions of what a “dwelling unit” should be. Today, the concept of home and how people are choosing to live is constantly evolving and building codes should limit constraints on possible alternative options and clarify what is specifically intended.

Although rules set forth within building codes are established to regulate building construction and modification, they limit the adaptation of single-family housing for alternative living situations by potentially requiring adherence to complicated and costly safety features not typically required in single-family housing, by not requiring all housing structures to be accessible, and by allowing definitions to be left to interpretation. As with zoning, these rules ultimately guide design and development down a very specific path with little room for alternative options.
A PROPOSAL FOR FUTURE HOUSING AND COMMUNITIES

This thesis has explored several ways in which housing and communities, as well as policies that govern housing and communities, can be adapted to better suit changing living situations, and how existing code and zoning regulations make this challenging. The following chapter takes previous research and proposals, as well as the analysis completed within the previous chapter, and applies them to zoning codes, communities, and housing types to show what each might look like as adapted for multigenerational and shared living situations. Understanding that communities and housing styles vary throughout different regions in the United States, that different municipalities have distinct needs and issues to be addressed within zoning codes, and that the needs of each household are completely unique, the intent of the following proposal is to provide a general baseline by which zoning, communities, and housing can be adapted. As established in the previous chapter, the focus of this thesis is single-family housing, 2,600 square feet or less, in Post-Suburban communities and homeowners in the middle-income range with limited superfluous income. Additionally, this thesis assumes the main reasons for choosing shared or multigenerational living situations are due to aging, economics, or need for additional support. The following proposal will first address zoning and provide suggestions for modifications to encourage development of communities and housing for shared or multigenerational households. The proposal will then provide recommendations for how to adapt and design communities and housing
within the updated zoning parameters.

**ZONING**

As discussed in the previous chapter, zoning is typically regulated at a local level, allowing individual municipalities to establish ordinances that respond specifically to local needs and issues. While this allows local authorities to provide individualized attention to each neighborhood under its jurisdiction, this can also limit or prevent cross-community planning. Lack of physical connection to neighboring communities limits residential mobility and engagement in everyday activities, particularly for those with disabilities or who cannot drive. Additionally, because each locality is unique, each will also offer a diverse range of community options for residents, but it also means a lack of standardization; what requirements or resources might be found in one community may not be found in another.

Several recommendations for adjusting zoning codes to allow for shared or multigenerational households include requiring a variety of housing sizes in the same neighborhood, promoting a pedestrian experience, providing incentives for residents or developers to add accessory dwelling units and provide community resources within accessible distance, and adjusting the definition of family to allow more flexibility in living situations.
Integration of Housing Sizes

Instead of segregating areas of a municipality into housing density or function, a suggested change of zoning codes would be to encourage integration of housing sizes. As indicated in previous research, this allows for residents in different life stages to live in the same neighborhood, promoting diverse, multigenerational communities. Multigenerational communities are efficient in their use of resources and provide a network of residents with a varied range of skills and facilities (Vliet 2019). For example, older adults who are retired are available during the day to monitor the safety of the community, volunteer with local efforts, or provide childcare to neighbors. Working adults may have greater physical capacity to assist older adults with everyday tasks and home maintenance. A school during the day may be used as a community center in the evening, serving a dual purpose and saving the community the extra cost of utilities and facility maintenance of multiple facilities. Integrated housing types also allow residents to transition into different life stages while they remain in the same community and maintain existing community ties. Strong community ties encourage engagement of residents; overtime, residents become invested in their community and build social relationships with friends and neighbors, which can provide a means of informal support (Kochera, Straight, and Guterbock, Thomas 2005, 22). For example, an older adult who cannot drive may be able to rely on a neighbor to take him to appointments or run errands, whereas, without help from neighbors, he may become isolated or be forced to move into a nursing home. Finally, integrated housing would allow family members to maintain proximity while also maintaining autonomy. For example, without integrated
housing types, an older couple that is retired and looking to downsize in the same neighborhood as their adult children and grandchildren, would either need to buy a house much larger and more costly than what is likely needed for just two people, or they would need to settle for a home in a neighborhood nearby. In a neighborhood with a variety of housing sizes, this couple would be able to live as close to their family as possible without sacrificing their privacy, housing needs, or possibly overextending their budget.

Critics might argue that smaller houses mixed in with larger houses would impact the value of the larger homes, or that variations in household size may also indicate variations in household income, lifestyle, and culture. For example, when a homeowner puts his home up for sale, his realtor will complete a market assessment of comparable properties nearby (Knorr 2018). If the most comparable properties are slightly smaller and sold for less, it will lower the market value of the larger home. Yet, a variety of housing sizes and types provides a range of comparable properties and establishes a demand for homes (Schmitz and Scully 2006, 36). Likewise, a two-bedroom, 1500 square foot home is going to cater to a different demographic than a four-bedroom 3,500 square foot home. Buyers for these two homes are likely to have different incomes or be in different life stages. A homeowner of a 1,500 square foot home located amongst a neighborhood of 3,500 square foot homes may feel they have nothing in common with their neighbors, and vice versa. However, if there is a diverse range of housing sizes and types, there will also be a diverse range of homeowners, incomes, lifestyles, and cultures. Finally, if we consider the cost of developing a new neighborhood with various size houses within the confines of traditional zoning practices or segregated housing types and densities, two factors are important: cost of land development and the cost of building the
houses. The cost of land development should remain somewhat static regardless of the types of houses because all the lots will be around the same size. In terms of housing construction, smaller houses do not result in as much of a profit margin as larger homes (Brand 1994, 201) and many single-story homes have a larger footprint than two-story homes, resulting in greater excavation costs, formwork and foundation costs, and roofing costs. If builders and developers are permitted flexibility in terms of the lot sizes and density permitted within one neighborhood, land can subdivided more effectively (Schmitz and Scully 2006, 36) and more houses can be built within the same area, retaining similar profit margins.

Figure 4-1 Valley View Road neighborhood in York County, Pennsylvania depicting growth over decades - Source: Google Maps. “Valley View Road, York Pennsylvania.” https://www.google.com/maps/place/Valley+View+Rd,+Spring+Garden+Township,+PA/@39.9467254,76.6900186,574m/data=!3m2!1e3!4b1!4m5!3m4!1s0x89c88ed55c29302f:0x289fea3bb11f8bb9!8m2!3d39.9467254!4d-76.6878246 16 March 2019
In neighborhoods that were developed over decades, household variations already exist, proving that integrated neighborhoods are viable communities; otherwise homebuyers would not continue to move into these neighborhoods. In the neighborhood depicted in Figure 4-1, located in Spring Garden Township, York County, PA, which neighbors York Township, online real-estate records indicate that the smaller houses at the entrance to the neighborhood were first built in the 1940’s and new, larger houses were continually added all the way through the 1990’s. Houses at the entrance of the neighborhood built in the 1940’s range in house size from 1,000 to 1,500 square feet and lot size from 7,500 square feet to a quarter acre (Zillow). Houses in the back of neighborhood built in the 1990’s range in house size from just over 2,000 to over 3,500 square feet and lot size from a quarter acre to almost one acre (Zillow). One can see the transition and gradient of housing and lot sizes from left to right, indicating that variations in housing size can be established through gradual development.

Promoting a Pedestrian Experience

In addition to integrating housing sizes, a suggested change to zoning codes is to promote a pedestrian experience within neighborhoods and communities to encourage physical engagement of residents, provide opportunities for social connection and interaction, and allow for mobility throughout the community without the use of a car. The more opportunities residents are given to be engaged in their community and make connections with neighbors, the more opportunities they have to build informal support networks and remain active, which is particularly beneficial for children and older adults.
whose involvement in society may be limited due to age and mobility restrictions.

Additionally, pedestrian-friendly communities provide more housing options for those who would typically be limited by a need for proximity to shopping centers and public transportation.

As seen in the examples in the previous chapter, current zoning dictates that areas are segregated by function and typically located organically, many times based on locations of major roadways or barriers, or by whatever development happens to occur first. In suburban communities, where residential areas are often segregated from shopping and commercial areas, the use of a car is the most convenient form of transportation and often the safest way to get to everyday necessities. Figure 4-2 indicates existing zoning where areas segregated by function, housing density and size and separated by roadways and barriers. In order to promote a pedestrian experience, walking must be convenient, safe, and stimulating (Schmitz and Scully 2006, 21). Several zoning strategies for improving the pedestrian experience of communities include various forms of mixed-use development and strategic master planning initiatives.
Mixed-use development strategies can specifically mandate that there be integration of commercial, shopping and residential uses, or they can promote flexibility and incentives to motivate developers to include pedestrian-friendly strategies. Planned Unit Developments are one such mixed-use strategy that allow for a variety of housing types in conjunction with the development of commercial and shopping areas, creating coordinated and integrated pedestrian-friendly communities by utilizing large parcels of land rather than individual lots (Schmitz and Scully 2006, 96). While these communities are still regulated under traditional zoning parameters, they are appealing to potential residents due to proximity of shopping, walk-ability, and the varieties of housing offered, and allow developers to balance cost with profitability due to the density of the community and the consolidation of the development. Similarly, strategic master planning initiatives such as Traditional Neighborhood Development and Smart Growth Ordinances, establish a set of guidelines that promote flexibility in uses and pedestrian-oriented initiatives, but dictate how these various uses can be integrated within the
community (Schmitz and Scully 2006, 96-98). Where mixed-use development would most likely entail new development within an existing community, strategic master planning initiatives can help transform an existing car-dependent suburban community into a pedestrian oriented community by requiring sidewalks and bike lanes on roadways and promoting the development of walk-able destinations that connect the broader community. With a clear-cut strategy for future development, local governments can better guide new and infill development.

**Figure 4-3** Proposed Zoning: Housing sizes and density are integrated within residential areas; destinations and community resources connect adjacent residential areas. Larger commercial areas are centered within a cluster of residential areas. Pedestrian connections are factored into all neighborhoods and resources - Diagram by author

Figure 4-3 depicts a proposal for updated zoning practices to promote a pedestrian experience within residential communities. Residential neighborhoods need to provide integrated housing sizes and densities, as well as pedestrian accessible destinations and resources between separate neighborhoods. These destinations can then be used to create a network of pedestrian friendly connections throughout larger communities. Housing
variety provides options for residents of all life stages and age groups and pedestrian-friendly communities and destinations encourage social interaction and connection between residents, as well as greater mobility between residential and commercial areas.

**Development Incentives and Restrictions**

Creating pedestrian friendly, multigenerational communities requires that a local government recognize the need for restructured communities and requires that residents push for updated policy and changes to their community. Once there is a cohesive goal between local municipalities and the needs of residents, a strategy for promoting development and changes can be established. Ultimately, pedestrian friendly, multigenerational communities can be established in three ways: local governments can directly intervene or fund community improvement projects, local governments can provide incentives and establish requirements for developers to create these communities, and local governments can provide incentives for residents to update their personal properties for multigenerational living.

As outlined in the previous section, establishing a strategic master plan strategy is one way local governments can incentivize and influence development. A well-established master plan defines the current and future needs of the community; it defines the overall goals of the community; and it provides specific requirements and guidelines for carrying out these goals. A strategic master plan can eliminate some of the upfront research a local developer might do before beginning a new project, by clearly defining critical projects, ultimately saving the developer time and money. Local governments can
also incentive development by funding infrastructure improvements that would ultimately deter developers from starting a new project (Schmitz and Scully 2006, 102). Local governments can encourage new projects by updating roadways, infrastructure, parking, or any existing community element that might discourage development due to the additional expense. Finally, if a piece of land is critical to a particular development project, local governments can reduce costs to developers by enforcing eminent domain to obtain the property or phasing the sale of the property to a developer over time (Schmitz and Scully 2006, 100-102). Where land values are at a premium or owners attempt to sell at prices above market value due to high demand, eminent domain ensures the owner receives a fair price while also keeping costs low for the developer. Phasing the sale of the land allows the developer to spread their costs out over time.

When developers have already established a desire to pursue a new project, impact fees are one way to incentivize the development of community resources and the implementation of pedestrian-friendly and multigenerational strategies; yet this strategy may discourage development in areas where there is not already a high demand. Impact fees would require a developer to invest a certain percentage of the project into a community specific resource, like a new public park. Tax incentives are a second way local governments can incentivize development of pedestrian-oriented and multigenerational communities within a larger project. If a developer agrees to comply with specific design guidelines or provide a community resource, local governments can offer tax incentives, such as tax forgiveness or lowering tax rates, to help mitigate construction costs (Schmitz and Scully 2006, 100-102).

Lastly, when private owners add an addition or improve their lot in a manner that
would increase property value, many times local governments will reassess the property value and increase property taxes. Particularly in areas where property taxes are already high, this can stifle private development. Local governments can offer incentives, such as no increase in property tax value or waiver of permit costs, to help promote private development. Incentives may also limit the number of residents who attempt to make improvements to their property without obtaining a permit, which as discussed, helps to regulate code compliance and the overall safety of structures. From an architectural perspective, restrictions that preserve the character of the neighborhood, such as requiring additions and accessory dwelling units to aesthetically match the principal residence, are important to maintaining the vitality of existing neighborhoods.

Larger development projects can be advantageous in that construction and material costs are captured in bulk, resulting in less expense than when projects are completed on an individual basis. There is one design and permit fee, one mobilization of a labor unit to complete the construction, and one land development fee. Similarly, when projects are well planned and considered in terms of long-term evolution, redundancy and flexibility can be built into the existing infrastructure for future growth, saving costs through duplicating efforts. With private residential development, even though local governments may be providing property tax incentives to existing owners to encourage property improvement and densification, these projects will bring in new residents who will also provide an increase in income tax and overall cash flow throughout the community.
Definition of Family

In the previous chapter, it was established that many communities, in addition to building codes, have various definitions of family or requirements as to how many unrelated individuals may live in a single-family home. These may be intentionally limiting to prevent the establishment of large number of rental units. Or these definitions may be intentionally vague to permit flexibility in living situations in areas where options are valuable. In areas where renting is in high demand, definitions clearly defining what a family means and limiting the number of unrelated individuals permitted in one house are useful to promoting long-term permanent residents and to balance temporary living situations. Transient renters may not be as invested in the maintenance of the overall community, which could deter homeownership or long-term residents. In areas where living options are critical, definitions that are vague and promote a variety of living situations are important to motivating development and community growth. If the definitions are too restrictive, residents looking for flexible options will find other places to live. Regardless of the definition or the reason behind its place in the zoning code, local governments need to be cognizant of the affect these definitions have on the local community and be willing to make accommodations where necessary.

COMMUNITY

Neighborhoods and communities are defined by zoning regulations and segregated by housing type, which in turn typically dictates the life stage and household income to which the community caters, preventing a variety of housing sizes and
residents from existing in the same neighborhood. Likewise, many communities are
developed independently without connection to adjacent neighborhoods or commercial
areas and shopping centers, limiting mobility of those who cannot drive and stifling
community engagement and social interaction. Several recommendations for modifying
communities to encourage shared and multigenerational living arrangements include
promoting the pedestrian experience and community engagement at a neighborhood
level, densifying existing neighborhoods with infill units to cater to different types of
households, integrating housing types within the same neighborhood, and providing
modularity and redundancy for future flexibility.

Promoting the Pedestrian Experience at a Neighborhood Level

In conjunction with larger policy changes to encourage pedestrian oriented
development, strategies for improving the pedestrian experience of neighborhoods and
communities include creating destinations, a sense of place, a sense of safety, and
providing connections to adjacent communities. Walk-able destinations within
communities encourage pedestrian activity; social contact is an important aspect of
everyday life and the draw of social interaction within community destinations can be a
motivator for engagement within the larger community (Schmitz and Scully 2006, 23).
Destinations must be inexpensive to visit, easily accessible, relatable to many different
age groups, provide seating and protection from weather, and be located relatively close
to other activity (Schmitz and Scully 2006, 23-24, 47). Additionally, establishing a sense
of place emphases a cohesive community with specific destinations unique to that
community. Place making helps to define what is special about a particular location, why it is worth visiting (Schmitz and Scully 2006, 25). Safety is another critical factor in promoting a pedestrian environment. Encouraging street activity with greater visibility through front porches on houses and windows that face the street, sufficient lighting, wide sidewalks separated from the street with planting strips, narrow streets to slow traffic and designated bike paths on main roadways are all strategies to create a safer pedestrian environment (Schmitz and Scully 2006, 26. 36-37). Finally, without pedestrian connections to adjacent communities, residents who cannot drive or have limited mobility become restricted within their immediate neighborhood (Schmitz and Scully 2006, 40).

Providing pedestrian accessible destinations, typically within a quarter to a half-mile distance, between communities using sidewalks, trails, and bike paths all help to connect adjacent communities (Schmitz and Scully 2006, 23 & 47).

Figure 4-4 Street section to promote the pedestrian experience – Diagram by author

Figure 4-4 provides an illustration of a street section in a community where the pedestrian experience has been factored into the overall design strategy. Houses are close to the street and have front porches to encourage engagement with the street, sidewalks and roadways are well lit and well shaded, roadways are narrower to slow traffic and contain
designated bike paths, and signage helps to create a sense of place.

Figure 4-5 depicts two existing communities, as they currently exist under typical zoning practices. Lots and houses are all similar sizes, the only pedestrian specific areas are the sidewalks adjacent to the neighborhood streets, there are only three streetlamps within both neighborhoods, and the only connection between the two neighborhoods is a main road without a sidewalk. There are also no pedestrian destinations and minimal place-making features, like signage.

**Figure 4-5** Existing community – Graphic developed from Zoning Map of York Township [http://www.yorktownship.com/zoning-map/](http://www.yorktownship.com/zoning-map/) Adopted 11 September 2016

Figure 4-6 re-imagines these two existing communities as updated with a pedestrian
oriented design. Lots and houses are still all similar sizes, and sidewalks are still present along the neighborhood streets; however, a series of pedestrian pathways connects the two neighborhoods together along with four destinations located on the perimeter of the community. These perimeter destinations ties the two neighborhoods to other adjacent neighborhoods, draw outside visitors, and create a sense of place. Signage has also been located at strategic points to emphasize the destinations and sense of place. The quantity of streetlights has been increased to promote visibility at night.

**Figure 4-6** Existing community updated to promote the pedestrian experience - Graphic interpretation by author developed from Zoning Map of York Township

Densify Lots with Infill Units and Integrate Housing Size

Infilling residential lots with accessory dwelling units or entirely new housing units is one strategy to create communities for shared or multigenerational living arrangements. Within existing homogenous suburbs, accessory dwelling units or alternative housing types can provide the variety of housing options necessary to support residents of different ages and in different life stages. Additionally, existing communities have been established with infrastructure, schools, resources, and residents who are invested in the larger community network, so they require minimal effort to modify, when compared to new communities. Existing lots may be added to or parceled into separate units. Traditional zoning currently limits the amount of buildable area permitted on residential lots due to easements, setbacks and development restrictions. However, there are two options for modifying existing single-family lots for shared or multigenerational living.

Option one, depicted in Figure 4-7, shows a 2,500 square foot single-family home with a two-car garage on a 10,000 square foot lot and an attached or separate accessory dwelling unit added. Perhaps one of the easiest ways to adapt an existing community for shared or multigenerational households, option one is the least invasive to existing community layouts and simple for most homeowners to accomplish. This option does not require adjustments to easements, setbacks, or maximum lot coverage restrictions. However, within the confines of existing zoning regulations, this option would require additional parking space for the increase in living area.
**Figure 4-7** 2,500 square foot home with a two-car garage on approximately 10,000 square foot lot with an accessory dwelling unit added, either attached to the principal residence or separate – Diagram by author

**Figure 4-8** An average single-family lot divided into two with second, smaller house added – Diagram by author

Option two, depicted in Figure 4-8, shows the same size house on the same size lot, but the lot has been divided into two equal size lots with a second, smaller house
added. Option two can be accomplished in two ways: either the original owner can build and rent out the second residence, or the original owner could sell half of their lot to a developer or future homeowner. This option would require the use of easement space for a second driveway and a new curb cut, assuming the only access to the lot is from the front and would also require an adjustment to the maximum lot coverage outlined within zoning regulations. Additionally, large changes in the quantity of impermeable surfaces or increased demand on existing utility connections would require updates to the existing infrastructure and storm water management systems, which could create additional expenses for the local municipality, or the individual involved with the development.

Each of these options encourages the adaptation of traditional single-family neighborhoods for shared or multigenerational living by densifying the existing community with a variety of housing options. Zoning codes need to permit flexibility in easements, setbacks, and allowable buildable area to encourage densification of existing neighborhoods and storm water management and infrastructure systems need to be designed with redundancy for future growth.

Another strategy for creating communities for shared or multigenerational housing is to provide integrated lot sizes within one community. Lot sizes can be random and mixed together (Figure 4-9) or they can change linearly throughout the neighborhood (Figure 4-10). Ideally, however, if the goal is connection between residents of all ages and life stages, random integration will promote the most community connection because it does not differentiate between house sizes.
Figure 4-9 Random lot size integration – Diagram by author

Figure 4-10 Gradual increase in lot size – Diagram by author

Figure 4-11 illustrates the same two neighborhoods shown previously in Figures 4-5 and 4-6; however, this time the neighborhoods have been reconfigured to incorporate integration of lot sizes and housing sizes. Additional streets have been added to accommodate the modified lots, there is still a network of pedestrian pathways connecting each neighborhood with adjacent destinations and additional site lighting and signage, but there is also a greater variety and density of housing.
To reiterate the importance of providing a variation of housing sizes in one neighborhood, varied housing sizes allow residents in different life stages to live in the same neighborhood, promoting diverse, multigenerational communities. It also allows residents transitioning into different life stages to remain in the same community maintaining existing community ties, and family members are able to maintain close proximity while also maintaining autonomy. From a development standpoint, more
houses and greater density will balance the low profitability of smaller housing sizes.

**Modularity and Redundancy for Flexibility**

Modularity of housing within the overall community is another strategy to promote shared and multigenerational housing. According to Virginia Savage McAlester, “most simple-plan houses have facades either one, two, or three structural units in width. Each width normally has characteristic patterns of symmetry in the arrangement of door and window details (2013, 26).” Modularity enhances the cost effectiveness of the construction process, standardizes the size of lots and living spaces, as well as the features on a site and within the home, and makes adjustments to housing units easier. Additionally, redundancy in infrastructure, utilities, and building support allows for future growth or modifications at reduced cost by incorporating these features during construction rather than after the fact. Once a community has been developed and houses built, it is difficult and much more costly to make changes to accommodate additional growth.

For example, in a neighborhood where lot sizes and housing sizes have been integrated, if each of the larger lots are an acre in size, each of the medium lots are half of an acre, and small lots are a quarter of an acre, if a homeowner planned to divide his lot in two, it would allow for two equal size lots that coordinate with the rest of the community. Similarly, if each lot and house is designed with the same accessible features, and same room sizes, but the only the difference is the actual size of the lot and number of rooms within the house, an elderly resident looking to downsize could do so
without concern of needing to update his new residence to accommodate his changing mobility needs. Additionally, because a builder or developer will be buying material in bulk and already has the construction staff available, factoring in housing features during construction is much more cost effective than it is for private residents after the home is built. If a homeowner decides they want to install grab bars in each of their bathrooms, if the house was already built with the necessary blocking needed to support these grab bars, the project will cost the homeowner much less than it would if this blocking had not been installed previously.

Figure 4-12 Modular housing unit sizes – Diagram by author

Lots and housing within communities designed for shared or multigenerational living should focus on housing sizes that are modular and provide redundancy for future flexibility. As depicted in Figure 4-12, a one-unit house could be a studio or one-bedroom space, a two-unit home could be two to three bedrooms, a four-unit home could be three to four bedrooms, and a six-unit home could be four or more bedrooms. The overall intent is that if a home were ever to be modified, support for future updates or growth has
already been incorporated into the infrastructure, building systems, and structural systems. Similarly, when residents decide to change their living situation, lot and housing features are standardized providing consistency during housing changes and limiting the amount of customization required.

**HOUSING**

Within a single neighborhood, housing sizes are typically similar when communities are segregated by density. Segregation of housing sizes and types limits the flexibility of new and existing communities and limits the natural expansion and contraction of household size. This section will first review the average single-family home in regard to multigenerational and shared living arrangements, then options for modifying the average single-family home to accommodate varied living arrangements will be provided. Finally, a proposal for a new single-family house will be outlined.

Virginia Savage McAlester explains that almost all houses are made up of “simple combinations of room-sized units” (2013, 24); therefore, the floor plans provided in the following section are basic in nature and consist of room units. Additionally, as defined in the previous chapter, the basic functions of a “dwelling unit” include spaces for eating, cooking, living, sleeping, and sanitation; for this reason, the room units outlined in the subsequent housing plans will be broken into corresponding spaces. Finally, it is important to note that the intent of the house plans depicted in the following sections are to illustrate key principles for modifying single-family housing for shared or multigenerational living situations, understanding that there are many other variations of
the single-family house plan, and many more ways in which these principles could be applied.

Existing Housing

Regarding shared and multigenerational living arrangements, existing housing has several limitations; it implies use by one family, one owner, and everyone else is considered a guest. Yet, in shared or multigenerational households, even when residents are related, everyone contributing to the household is a separate invested party. In their book, *All in the Family: A Practical Guide to Successful Multigenerational Living*, Sharon Graham Niederhaus and John L. Graham suggest that all members of a multigenerational household have needs to be met and resources to offer, and that each invested party must agree to how these needs and resources will be met and exchanged (2013, 91). Privacy is critical to maintaining successful shared living arrangements, but existing housing does not provide separate spaces for separate “owners.” Niederhaus and Graham emphasize the importance of “proximity and privacy” in multigenerational living arrangements (2013, 107). Existing housing also does not accommodate accessibility without owner modifications; it is built with the assumption that its users are all able-bodied residents, despite the likelihood that it will house a resident with some sort of mobility impairment over the course of its lifetime (Smith, Rayer, Smith 2008, 290-291, 301). Finally, existing housing is not built with flexibility in mind. Individual spaces are not made to function in multiple ways without significant modification, nor are building systems and structure designed to accommodate future changes without significant cost.
to the owner. Stewart Brand suggests that a “spatially diverse” building is easier to make adjustments to than a “monotonous” one (1994, 186) and Smith, Rayer, and Smith suggest that it is much more cost effective to add accessibility features to a home during its original construction, rather than after the fact (2008, 302).

Figure 4-13 below depicts the first and second floors of a 2,500 square foot single-family home with a two-car garage. Inside the house are two living spaces, two eating spaces, a cooking space, four rooms for sleeping, and provisions for sanitation on both floors. As indicated in the sketch, several issues regarding shared or multigenerational living arrangements are presented.

First, the ground floor is typically the communal living space, and the second floor contains the private sleeping areas. There is one main entry through the front door, and two secondary entries or exits at the back and through the garage. The entry/exit points can pose a problem in terms of privacy in that they require a resident to walk through the entire house to get to private bedroom areas. Additionally, the back door may not be easily accessible from the front of the house or street, and unless there is a separate man-door within the garage, one would need to raise and lower the garage door to enter or exit from this point. A single stairway to the second floor, located in the center of the house, poses similar issues. In shared or multigenerational living arrangements, a resident of this house would not be able to enter or exit from their private space without another member of the household being alerted to their arrival or departure. Similarly, when all the bedrooms are on the same floor, there is little separation or privacy for different residents. In many existing homes, there is also one large bedroom with an en suite bathroom, sometimes referred to as the “owner’s suite.” In shared households or
multigenerational households with equal financial contributors or residents of a similar age, this may create conflict as to who is considered the “owner.” Finally, if all the spaces on the first floor are open to one another, residents could only use the ground floor space if they planned to interact with one another.

Figure 4-13 Existing 2,500 square foot house with two-car garage – Diagram by author

Second, all the entries require the use of steps to get into the house. Steps are also required to get to the second-floor bedroom area. Bathrooms are not typically designed with the necessary support for grab bars or the space to accommodate wheelchairs or walkers. Kitchens may also not be designed with the space or the appliances to accommodate users with disabilities. These features limit the adaptability of the house for users who are disabled or mobile-impaired, particularly aging residents.

Finally, spaces on the first floor are open to one another and are specialized per function; this limits the flexibility of the overall space. The eating area off of the main
entrance has a centralized chandelier light fixture, suggesting a location for a table. The living space adjacent to the main entry is intended as a sitting area in which to greet guests. The living area in the back of the house is the casual family gathering space for watching TV. Without the ability to separate these areas, and because they have been designed with the building systems and storage particular to their function, it is difficult to adapt their use.

**Options for Modification**

When existing single-family housing does not meet the needs of shared or multigenerational households, there are three options homeowners can pursue: modify the existing house to suit the changing needs of the household, move into a new house that is better suited to the needs of the household, or build a new, custom house to suit the needs of the household. The following section will outline potential home modifications in terms of shared or multigenerational living situations and then provide a cost analysis compared with moving or building a new custom home. Regarding home modifications, four general strategies are common: interior space conversions, garage and unfinished space conversions, additions, and accessory dwelling units (Litchfield 2011, 21-43) (Niederhaus and Graham 2013, 145-167).

Interior space conversions consist of taking existing finished space and converting it into a different kind of space. For example, converting a living room into an additional bedroom by infilling an opening and adding a door. Interior space conversions are simply a reconfiguration of existing space, located in a portion of the house that is already
insulated, heated, and ventilated; this is typically the simplest and most economical way to modify a house for shared or multigenerational living arrangements (Litchfield 2011, 33) (Niederhaus and Graham 2013, 146). Other benefits to interior space conversions include making use of unused rooms, the ability to keep family members close by if needed, and there is no additional land required to create the additional space (Litchfield 2011, 34). However, because of the proximity of the separate spaces, there may be issues with sound travel through walls or lack of privacy between household members (Litchfield 2011, 34). Also, if the intent is to add an additional kitchen or bathroom, laying out the necessary plumbing may be challenging in a finished area; splitting utilities may also be a challenge (Litchfield 2011, 34). Interior conversions are best suited for smaller lots, residents who don’t mind living in proximity, or when changes need to be made quickly or cost-effectively. Figure 4-14 depicts an example of an interior conversion where an existing living space on the ground floor is converted into an additional bedroom, a ground floor bathroom is enlarged, and a bedroom space on the second floor is converted into a living space. In this instance, modifications may include closing off a wall or adding a door to the ground floor living room to create a private space, and restructuring the existing bathroom to permit a shower or wheelchair space. The most complicated aspect of this conversion would be finding the additional square footage for the enlarged bathroom and incorporating the plumbing changes into the existing house structure.
Garage or other unfinished space conversions include basement and attic conversions. These home modifications consist of taking unfinished space and converting it into separate, finished living space. Because these renovations utilize the existing building structure, they are also an economical way to modify an existing house for shared or multigenerational living situations. Similar to interior space conversions, these options do not require any additional land and allow for close proximity of household members (Litchfield 2011, 23, 29, 37). Garages and attics are typically not heated or ventilated as required for habitable space and their structure may not have been designed to support a livable unit (Litchfield 2011, 29, 37) (Niederhaus and Graham 2013, 157). However, because the structure is typically exposed, insulating and adding electrical and mechanical systems is fairly simple. Basements and attics can pose issues in terms of accessibility if there is no at-grade entry, while garage conversions can eliminate valuable parking spaces (Litchfield 2011, 23, 29, 37) (Niederhaus and Graham 2013, 156). Unfinished space conversions are best suited for lots where space is limited and
households where proximity is important. Where garage conversions are the most accessible, basement and attic conversions are the most suited for shared living arrangements or younger residents because they offer more privacy from the main house than other interior conversions, but typically require the use of stairs, which may be difficult for residents with limited mobility. Figure 4-15 illustrates two possible unfinished space conversions, the garage and the attic. The garage would provide a separate, accessible space for someone with limited mobility, but would reduce parking area and the attic would provide separate, private space, but would require the use of stairs to access. Additionally, acoustical privacy is a bigger challenge with retrofitting than with new construction.

**Figure 4-15** Unfinished Area Conversion – Diagram by author

Additions consist of adding additional living space onto the existing housing structure. As with interior conversions and unfinished space conversions, additions are another way to provide separate space, but maintain proximity in shared or
multigenerational living arrangements. Some additional benefits of additions are that they utilize at least one wall of the existing structure, so they are more cost-effective than a separate unit; they also require less lot area than a separate unit (Litchfield 2011, 32). However, because additions utilize more lot area than the original structure, they may be susceptible to maximum buildable area restrictions; or it may be a challenge to create something that coordinates with the scale of the house and overall neighborhood; and because additions are attached to the main house, there may be issues with noise or utility separation (Litchfield 2011, 32). Additions are well suited for situations where the main house is too small to convert interior space, or the interior space is not well suited for a conversion. Figure 4-16 illustrates a possible addition off the garage area, providing access to the driveway and parking area.

**Figure 4-16** Addition – Diagram by author

Accessory Dwelling Units are separate living units on the same lot as a primary residence that share a yard and driveway; typically, accessory dwelling units contain a
kitchen, living room, bathroom and bedroom (Niederhaus and Graham 2013, 107).

Benefits of accessory dwelling units are that they provide the most privacy and sound isolation, utilities can easily be separated, and they are great for rental situations (Litchfield 2011, 39). However, accessory dwelling units are the most expensive way to modify an existing house for shared or multigenerational living situations because they require site excavation, new utilities, and are free-standing structures; they take up the most lot area; are the most susceptible to maximum building area restrictions; and may require additional parking spaces (Litchfield 2011, 39). Accessory dwelling units are well suited for family members who are independent and want to maintain their privacy or shared living situations where space separation is valuable. Figure 4-17 illustrates an accessory dwelling unit that provides separate living space with close proximity to parking but does not compete with the main residence.

**Figure 4-17** Accessory Dwelling Unit – Diagram by author
Ultimately, the more the existing house structure can be used and the less it needs to be modified, the more cost-effective renovations and modifications for shared or multigenerational living situations will be. The cost of interior conversions and unfinished space conversions can vary widely depending on the extent of the modification; for example, the average cost to remodel a bathroom is $6,000 to $15,000 (Home Advisor, Remodel Multiple Rooms). The cost of additions and accessory dwelling units can also vary depending on the extent of the modification, but they typically cost $80 to $200 per square foot (Home Advisor, Cost to Build an Addition). So, a 200 square foot accessory dwelling until could cost between $16,000 and $40,000. However, when compared with the costs typically associated with moving or building a custom home, renovations and existing home modifications are an economical option for shared and multigenerational households. A new home typically costs about $150 per square foot (Home Advisor, Cost to Build A House), but this does not include the purchase of land or the site work and development required to prep the land for construction. So at a minimum, a new 2,000 square foot home would cost $300,000 plus the purchase of a lot and any site development. These costs also do not factor in other living expenses required while the house is being constructed. When selling a home, there is typically a six-percent realtor fee taken out of the sales price of the home, plus the closing costs required to purchase a new home, which can be anywhere from two to five percent of the purchase price (Zillow, What Are Closing Costs). If a family is selling their home for $250,000 and purchasing a new home for $250,000, they will spend anywhere between $20,000 and $30,000 on realtor fees and closings costs, in addition to the down payment required to secure financing. Additionally, there are added expenses of hiring movers; interest
rates may be higher at the time of re-purchase increasing the cost of the house over the
life of the loan; and there is the time it takes to sell a house, pack, move, and unpack. For
these reasons, home modifications are the most cost-effective solution for adjusting
housing for shared and multigenerational living arrangements. The more houses are
designed to be flexible and support varied living arrangements, the easier they will be to
modify and add to as needed.

**Proposed Single-Family House**

To support shared and multigenerational living arrangements, houses need to be
flexible and easy to modify, but they also need to be economical, support individuals with
limited mobility, and provide necessities for daily living. The following section will
review examples of houses designed for shared and multigenerational living
arrangements, as well as what makes a house flexible and suitable for varied levels of
mobility. Finally, this section will provide a framework to design single-family housing
for shared and multigenerational households. Again, the proposed floor plan is intended
to illustrate the main principles for single-family home design for shared or
multigenerational living situations, understanding that there are many more ways in
which these principles could be applied.

Existing examples of housing for shared and multigenerational households consist
of a prototype by a national homebuilder, private commissions for families designed by
architects, and design proposals such as this one. Next Gen Homes by the Lennar
Corporation is their prototype home design for multigenerational households available in
select locations in twenty U.S. states (Lennar). They describe the home style as a “Home within a home” for maximum flexibility for anything from a home office, a rental unit, or a separate space for relatives to live (Lennar). The floor plan published by the builder depicts a three-bedroom home with two-car garage, and an additional living unit with separate entry and garage but attached to the main residence. While Lennar’s design certainly provides proximity with privacy, as well as flexibility, the average price of a Next Gen home is approximately $600,000; home costs vary depending on location (Lennar). The U.S. Census Bureau’s American Community Survey five-year summary from 2013 to 2017 reports the median home value in the U.S. to be just under $200,000 (QuickFacts United States), which would put the Next Gen home out of financial reach for many Americans.

The Choy House is a private residence commissioned by a family and custom designed by O’Neill Rose Architects in Queens, New York (The Choy House / O’Neill Rose Architects). Commissioned by two brothers for their individual families, as well as their mother, the Choy House consists of three separate dwelling units within one structure, designed within a single-family development to look like a single-family home (The Choy House / O’Neill Rose Architects). This house also provides proximity with privacy for different generations under one roof by combining three separate residences into one. Additionally, the separate units could be restructured into a single unit, or used as rental properties to help offset the higher construction cost, while coordinating with the adjacent single-family homes. However, as with the Next Gen homes, and as indicated in the previous section, custom housing is expensive and not a viable option for many Americans, and the fact that this house contains three dwelling units within one
structure, may have implications on how it is classified per code resulting in additional restrictions and regulations.

Finally, The Open House, a prototype designed by architect Pierluigi Colombo for the Making Room Exhibit displayed at the National Building Museum in Washington D.C. from November 2017 through January 2019, is an example of flexible housing designed to adapt to changing living situations. The Open House is a living unit of approximately 1,000 square feet with movable walls and multifunctional furniture (National Building Museum). The overall principle of the design is that spaces and furniture can be converted to serve multiple functions with all features of the house designed to the Americans with Disabilities Act standards. For example, when not in use bedrooms become living space through the use of fold-up beds that transform into seating. Ultimately, the architect designed the house for three primary living situations: roommates, extended family, and empty nesters (National Building Museum). While this design certainly provides for maximum flexibility in a compact space, it does so at the expense of providing truly, private space. If a member of this household wanted to retreat to their bedroom during the day for a nap or just a few moments of quiet, private time, it would be difficult to do so when that bedroom is being utilized as a living space by other household members.

Based on the examples above, as well as previous research and proposals, and the analysis provided within this thesis, housing for shared or multigenerational living arrangements must encompass a balance of the following principles. Housing must first contain elements necessary for daily living: cooking, eating, sleeping, sanitation, and living space. Housing must provide a combination of private space and flexible common
space. Housing must be accessible to those with limited mobility. Finally, housing must be economically attainable and financially feasible to modify for most Americans as indicated with the middle-income range. Figure 4-18 provides a graphic representation of a 2,100 square foot home with two-car garage, designed to adapt over time and as the occupants change. The proposed floor plan is intended to illustrate the main principles for single-family home design for shared or multigenerational living situations, understanding that there are many more ways in which these principles could be applied.

**Figure 4-18** 2,100 square foot home with two-car garage, designed to adapt over time and as the occupants change – Diagram by author
Per code requirements, all dwelling units must contain space for cooking, eating, sleeping, living, and sanitation. Therefore, housing must contain at a minimum one bathroom, one kitchen, a place for a bed, and additional space for living. However, to satisfy the average market conditions outlined within this thesis and to provide the most flexibility for shared or multigenerational households, housing must contain at least two bedrooms or private spaces; two separate common areas, and at least one kitchen. These separate spaces allow household members to live under the same roof but maintain a level of independence if desired. Additionally, if there is a minimum of two of each type of space, the house can be divided as needed for different living situations without requiring a significant amount of modification. Furthermore, every room needs to have a window, including bathrooms and utility spaces. First, natural light will not only cut down on utility costs by supplementing artificial light, but ventilation and window access is a requirement for habitable spaces; therefore, the more spaces that contain windows, the more adaptable the house becomes. For example, a basement is typically constructed with poured concrete walls. If windows are not planned during the initial design and construction process, they can be difficult and costly to add after the fact, and then the basement would be unsuitable as additional living or sleeping space. In the example depicted in Figure 4-18 above, the house contains one main kitchen, one bathroom on the ground floor, three common areas on the ground floor, two stairways, and the option to add an accessory dwelling unit or finished space above the garage. The second floor contains three private sleeping areas, two bathrooms, and a separate living space. Every space is along the exterior perimeter, allowing for a window.

Housing for shared or multigenerational living arrangements must also provide a
combination of private space and flexible common space. Niederhaus and Graham claim the two most important features to maintain proximity with privacy in shared or multigenerational households are a separate entrance and separate kitchens, as the ability to freely come and go exemplifies ultimate autonomy and the kitchen is the “heart of the home” (2013, 105). In the example above, several spaces on the ground floor have the ability to be converted into a separate bedroom and the option to add an accessory dwelling unit attached to the main residence with its own entrance and kitchen allows for family members or roommates to share one residence, but maintain separate living areas. Stewart Brand says that there are six functions of a building: site, structure, skin, services, space plan, and stuff; and that the key to an adaptive house is allowing flexibility and independence of each of these functions (Brand 1994, 20). Therefore, to maintain the utmost flexibility, spaces must be designed to accommodate all possible uses, including the ability to open or close off the space; generic lighting types and layouts; other building systems such as power, data, and ventilation; location within the house plan, and overall size of the room. In the example in Figure 4-18, common spaces on the ground floor can be open or closed; this can be accomplished with concealed pocket doors, or glass French doors. On the second floor, bedrooms and bathrooms are connected by a central vestibule, which not only provides additional privacy, it also allows these spaces to be used as both sleeping and living areas. There is also no implicit designation of “owner” and “guest” space; rooms are all similar sizes with similar access to the main house features, similar to the Victorian style house discussed in chapter two. Finally, as indicated in the example in Figure 4-18, a second stairway located near a secondary entrance and common area on the second floor support the flexibility of the house for
varied living arrangements. The house can be easily divided into two living spaces, first and second floor, by providing multiple living areas, as well as an additional private entry and exit.

The likelihood that a house will contain at least one resident with mobility issues or host a disabled visitor is high, indicating a significant need for accessible housing features. Given that these features are much more economical to factor into a home during construction rather than after the fact, housing for shared or multigenerational households must incorporate accessible features during design and construction (Smith, Rayer, Smith 2008, 301-302). Similarly, it is also important to factor the cost of not providing accessible features; injuries, the need for in-home care to get around, and the cost of a nursing home have considerable implications for all Americans when contributing to social programs like Medicare (Smith, Rayer, Smith 2008, 301-302). When the average cost of a private room in a nursing home is estimated to be just under $8,000 a month (Nursing Home Costs) and a significant increase in enrollment in Medicare due to the increase aging population is predicted over the next several decades (Peter G. Peterson Foundation 2019), the need to support individuals with limited mobility in traditional housing is indisputable. The 2010 ADA Standards for accessible design specifies features such as barrier-free entries and thresholds at showers; specific counter and mounting heights to accommodate those with reach limitations; minimum clearances for wheelchairs in bathrooms and appliances, and minimum corridor and door widths. As indicated in the example provided in Figure 4-18, all house entry points must be no-step entries with sloped walkways or at-grade entrances. At least one bathroom, particularly on the ground floor, must be designed to accommodate a wheelchair; wall
framing must also include extra support for grab bars. Kitchens must include varied counter heights and accessible appliances; for example, microwaves could not be placed above the stove. Finally, doorways and hallways must be wide enough to accommodate wheel chairs. When compared to the implications and potential costs of not providing accessible features within homes, the cost and difficulty of providing these features during design and construction is minimal and necessary.

Finally, housing for shared or multigenerational living arrangements must also be economically attainable and financially feasible to modify. Stewart Brand emphasizes the need for smaller buildings, which are more affordable and allow for future growth (Brand 1994, 155), but that smaller houses do not allow for enough of a profit margin to entice development (Brand 1994, 201). However, as seen in the previous section, if zoning regulations are modified to permit a range of housing sizes and densities within the same community, developers can retain similar profit margins by providing more housing units within one community. In a single or couple household, a one-room or studio size space may be sufficient for housing. In a parent-child household, a two- to three-bedroom space would be sufficient, allowing one room for the parent(s) and one or two rooms for the child or children. A multigenerational household may need a three- to four-bedroom space, assuming one or two rooms for the child or children, one room for the parent(s), and one room for the grandparent(s). Shared households could be accommodated in any one of these size spaces. Therefore, two- and three-bedroom houses are ideal for the broadest range of living situations: roommates, couples, single parents, co-parents, and multigenerational households. In addition to modest size, houses must be designed with future additions and modifications in mind. This requires the inclusion of redundancy.
within the mechanical, electrical, and plumbing systems, additional blocking or support structure within floors and walls for finishing of unfinished space or grab bars in walls, and site layout to accommodate additional building square footage and parking.

Policy and design for changing living situations is most critically impacted at three levels: zoning, community, and housing. Changes must first be implemented at the policy level, within local zoning regulations, to support future design changes. Without guidance and regulations from local jurisdictions to help direct new development, developers are free to build however is most suitable to their agenda. Overall, local jurisdictions must focus on adjusting current policy to permit integration of housing sizes and increased density of new and existing communities by changing traditional zoning designations and providing incentives for well-defined development. Additionally, promoting a pedestrian experience through similar development incentives and regulations is critical to engaging residents and establishing communities suitable for all ages. Furthermore, initiatives to increase accessibility of existing communities and housing and to aid homeowners in making modifications to their existing homes will allow residents to remain in communities longer as their needs change. Accessible features and a combination of private and flexible common space create adaptable housing suitable for residents of all ages. Housing that is economically attainable and easy to modify allows residents to remain in their homes for as long as possible, maintaining existing community ties and support networks. Ultimately though, local jurisdictions must dictate these requirements and guide development and design to provide communities and housing for shared and multigenerational living situations.
CONCLUSION

Living situations are changing and will continue to change as the U.S. population grows older and more diverse, and as the notion of family continues to evolve from traditional nuclear family norms. Although there are still many traditional two-parent family households, there are now many single-person, single parent, or couples-without-children families; and on the opposite end of the spectrum, there are also a growing number of multigenerational and shared households. Housing policy and design has not yet adapted to these changing living situations but should be modified to accommodate not only a growing population, but also to better serve the diverse and distinct ways Americans are choosing to live. The challenge for communities that want to adapt to these realities is to produce housing that can respond to the natural expansion and contraction of household configurations, while also maintaining sensitivity to the intricacies and varied nature of household formation.

In order to evaluate existing policy and design for shared and multigenerational living arrangements, this thesis first reviewed changing demographics in the U.S. and the resulting dynamics of shared living arrangements and definition of multigenerational households. Many times, the success of shared living arrangements depends upon the nature on which they were established. Whether household members live together because they have chosen to do so, or they simply have no other option, makes a difference in how long the arrangement lasts. However, housing and communities can be
designed to encourage successful shared living arrangements by helping to convey solidarity between residents and helping to provide a sense of control, ownership, and privacy over the living arrangement for each resident. Housing and communities can also be designed to encourage successful shared living arrangements by allowing for change within household size and structure. Multigenerational households are a type of shared living arrangement where residents are related; they can be one generation, like siblings, or multiple generations like grandparents, adult children, and grandchildren. There can be many reasons to choose shared living arrangements, but typically they result from financial stress, a need for affordable care giving, a desire for companionship, or unexpected life events.

After reviewing the reasons behind choosing shared living arrangements and what is required to maintain successful shared living arrangements, this thesis evaluated existing proposals for policy and design for changing living arrangements, which are typically broken into recommendations for community and housing. Overall, the need for diverse forms of housing in an integrated community setting with accessible access to community resources is a common theme. The principles extracted from these existing proposals were then evaluated within a case study in York Township, Pennsylvania, to provide an example of how policy impacts community and housing structure. The case study example indicated a lack of integrated housing types within isolated community settings, flexibility limitations due to setbacks and buildable area, and vague definitions of family and household structure. Building codes were also analyzed to provide insights on how occupancy can impact everything from the permitted structure type, accessibility requirements, and safety features.
The overall analysis culminated in a new proposal for policy and design changes for shared and multigenerational living arrangements at three levels: zoning, community, and housing. Within zoning regulations, four strategies to encourage shared and multigenerational living situations include integrating housing sizes and types, promoting a pedestrian experience through varied types of development, such as mixed-use, and establishing a strategic community plan to guide development and promote walkability initiatives, providing incentives and restrictions to encourage development of varied forms of housing and community resources, and providing flexible definitions of family to allow for varied living situations depending on the overall needs of the community. The recommendations at the community scale are intended to complement updated zoning regulations. Lot sizes and housing types are to be integrated within each neighborhood; social connection and engagement are encouraged through pedestrian-oriented design strategies, such as defining place and creating destinations; infill units further provide varied housing sizes and densify existing neighborhoods; and modularity and redundancy of lot sizes and housing types allows for future flexibility at low cost to developers and future homeowners. Finally, existing housing inhibits shared and multigenerational living arrangements through lack of privacy, accessibility, and flexibility of spaces. The most affordable options for modifying existing housing for shared and multigenerational living arrangements include interior space conversions, unfinished space conversions, additions, and accessory dwelling units. However, new housing units can be designed to provide privacy, accessibility, and flexibility for shared and multigenerational living arrangements at low cost by incorporating generic, and similar size spaces with the ability to open or close off the area to the rest of the house;
incorporating accessibility initiatives into the initial design, providing redundancy in building systems and structure for potential future growth, and by starting with a smaller two- to three-bedroom house that can grow as needed. Ultimately, to allow for shared and multigenerational living situations, local jurisdictions and community members must take action and dictate community needs within policy regulations in order to guide future development and design.

A more detailed analysis of zoning modifications, including interviewing local planners, zoning hearing boards, and community members, as well as establishing a draft of specific language modifications within a zoning code would further compliment this thesis. Likewise, a more detailed review of housing construction and flexible infrastructure and building systems design for flexible living arrangements would build upon the new community and housing proposal. Finally, a model case study in which a local municipality would work with architects, engineers, and developers to establish a model community based on these proposed solutions would be a strong indicator of their validity and strength.
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104


