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Smart growth solution in Ames

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Smart growth solution in Ames

by

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This is to certify that the Master's thesis of
Cheung Chan
has met the thesis requirements of Iowa State University

Signatures have been redacted for privacy
TABLE OF CONTENTS

ACKNOWLEDGMENTS iv
PREFACE v
INTRODUCTION 1
CHAPTER 1: URBAN SPRAWL 3
CHAPTER 2: THE EDGE CITY 11
CHAPTER 3: LEARNING FROM THE DIGITAL WORLD 19
CHAPTER 4: POTENTIAL OF AMES 23
CHAPTER 5: PROPOSAL FOR DOWNTOWN AMES 32
CONCLUSION 52
NOTES 53
BIBLIOGRAPHY 55
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Preface

This project is my reaction towards the collection of my previous thoughts and feelings and beliefs about urban sprawl. Having coming from Hong Kong, a highly dense city where most people would love to have a two thousand square foot house with both front and back yards, which sites on the hill away from the crowded city and they would drive to work.

After coming to the United States where the dream is plentiful, I started to be aware of the problems that were associated with suburban subdivision living. It may not be best way to live after all.

However, there is always someone I know who lives in one of the split-levels. They would suggest all kinds of reasons to live in the suburbs. The struggle to question and understand continues throughout the years. I have also spent many of my weekends looking at model homes.

The non-conforming lot project presented an opportunity for me to do a project to resolve this issue with myself.

As I study, learn and experience more regarding this issue, I am sure that my thinking, ideas and beliefs will continue to be shaped and re-shaped.
INTRODUCTION

Cities in America

Traditional downtowns in America once recognized as the cultural, business, commercial and civic centers of America are deteriorating. No matter if they were still playing those roles, most people would agree that downtowns are not what they used to be. Offices, once crowded downtown, are moving away to the outskirts of cities. Department stores in downtowns are struggling to survive from the loss of customers to giant suburban shopping malls. Downtown playhouses are abandoned or converted to other uses while multiplex movie theaters are constructed throughout the suburbs and edge cities.

Modern day downtown has become a destination for people to go to work in the morning and leave in the evening. Many older neighborhoods surrounding the city core have become slums. Most people have driven through areas where houses have broken windows, walls and doors.

Robert Fishman suggests in his book, Bourgeois Utopia, that American cities are undergoing a de-centralization process. People depend less and less on the centrally located downtown. They would go to a regional mall to fulfill their shopping and entertainment needs and they would go to the corporate campus to work. This new way of living has created a new city form. The evolution of the new cities has been promoted by the popularization of the private automobile. As well, the widespread use of the Internet has forwarded the possibility of decentralizing the city. More importantly, the Internet provides strong implications in terms of how the new downtown shall develop in the future.

The Internet can be thought of as the newest technology that promotes the idea of living in an isolated world. It provides a higher degree of data mobility than the automobile can. People are able to shop for grocery and chat with friends online without even getting into their car. However, it is not only the high speed that has attracted so many users to the Internet. The Internet is also providing a fast-paced, spontaneous and flexible environment to the users. Comparing it to the physical environment we live in, especially the suburbs of America, where most of the Americans live now, it is difficult to believe that people are living in these two dramatically different
worlds simultaneously.

In this thesis, I examine the traditional concern of urban sprawl, new ideas about de-centralization of cities, the rise of the new edge cities, the role and impact of the Internet to the edge cities and future directions suggested by the Internet in urban housing.

The design work is going to focus on realizing the potentials of the non-conforming lot condition in Downtown Ames, Iowa. With the existing infrastructures in the area, it has the potential of becoming a more vibrant urban community. However, the automobile is still the basic mode of transportation in the area. In order to become a pedestrian oriented district, several changes are proposed to improve the walking condition for the district in the hope of encouraging walking as the primary mode of transportation. The changes proposed include new examples of houses that are designed based on observation of the current conditions and then integration of the existing features that promote interaction between neighbors and pedestrians into the new design.
CHAPTER 1
URBAN SPRAWL

Urban sprawl

Under the current situation of the American cities, some believe that the whole de-centralization process has generated a great many problems. The phenomenon of this de-centralization is called "urban sprawl". According to the report by the Sierra Club, urban sprawl has become a pressing issue throughout America. "Poorly planned development is threatening our environment, our health, and our quality of life. In communities across America 'sprawl' -- scattered development that increases traffic, saps local resources and destroys open space -- is taking a serious toll. But runaway growth is not inevitable. Hundreds of urban, suburban and rural neighborhoods are choosing to manage sprawl with smart growth solutions." Environmental associations, similar to the Sierra Club, are researching the many aspects of sprawl and publishing many articles and reports to inform the public about the consequences of and solutions for urban sprawl.

Urban sprawl does not only happen in large cities. Cities of many different sizes face problems caused by the growth of their suburbs. According to the 1998 sprawl conducted by the Sierra Club, Atlanta is the most sprawl-threatened large city in America. Kansas City, according to the same report, is the fifth most sprawl-threatened city in America. Orlando, Florida is the most sprawl-threatened medium city. McAllen, Texas is the most sprawl-threatened small city in America. However, the threat of sprawl does not stop with the small city. Ames, Iowa, a tiny city with a population of less than fifty thousand, also is undergoing a slow but disturbing process of sprawl. "Sprawl -- technically defined as 'low-density, automobile-dependent development beyond the edge of service and employment areas' -- is ubiquitous and its effects are impacting the quality of life in every region of America, in our large cities and small towns."

The most significant example of sprawl is Atlanta. By understanding more about the conditions in Atlanta, we can understand more about the harmful side of urban sprawl. Other than the recognition it already has, Atlanta is now famous for its sprawl. Besides being rated as the most sprawl-threatened large city in America in 1998, it
is often the target of radio and television reports on the issues of urban sprawl. National Public Radio has done many reports on the urban sprawl conditions in Atlanta. On May 10, 1999, in the radio show All Things Considered, a report about Atlanta was broadcast. "Ground Zero for urban sprawl in the U.S. is the Atlanta metropolitan area. In the 1990s, suburban development is eating up fifty acres of green space a day. And, on average, a person in Atlanta spends 34 miles on the road every day -- more than anywhere else in the U.S." Since traffic congestion is part of the daily routine in Atlanta, the thirty-four mile commute can easily translate to two hours of being in the car and on the road. Due to traffic congestion, the air quality in Atlanta is at an alarmingly low level. In the 1998 Sprawl Report, the Sierra Club reported, "air quality is also alarmingly poor. The 13-county region is in violation of clean air standards and has lost the right to spend federal money on new road projects. Children with asthma go to the hospital every summer because of high levels of ozone pollution".

Alongside the traffic problems, Atlanta is also losing its green space at a very high rate because of unplanned development. According to the same report, "green space is being gobbled up by sprawl faster than in any metro region in history (according to a real estate research firm and reported by the Atlanta Journal Constitution). Every week, five hundred acres of green space, forest and farmland are plowed under to build parking lots, shopping malls and housing subdivisions. Between 1982 and 1992, the amount of open space lost to development in the Atlanta metropolitan area increased by 38 percent. The rate of land developed nearly doubled in outer suburban counties such as Gwinnett, Henry and Paulding." All the above are problems caused by urban sprawl but the problems are not limited to them. Other problems can be seen from the conditions of other cities.

The situation in Atlanta is vital and causes concern for many distinct groups of people. From the same All Things Considered radio program, John Nielsen reported, "In Atlanta, it's not just the politicians and the environmentalists who are concerned about the pace of the city's growth -- business leaders, too, are trying to control Atlanta's development ... and they think they can make money in the process ... developers who have built their businesses in the suburbs who are now focusing on in-town projects and big employers who are moving
their offices from the suburbs to the city." Coca-Cola is one of the businesses planning on moving back into the city.

Being the fifth most sprawl-threaten city in America, Kansas City is not experiencing as extensive consequences as Atlanta. However, it is still struggling with the problems caused by the continuous growth of its suburbs, the lack of an adequate public transportation system and an overwhelmed freeway system. "Kansas City already enjoys the dubious distinction of having more freeway lane-miles per capita than any other city in the country. The percentage of work trips made by people driving alone is 79.7 percent, above the national average of 73.2 percent (Kansas City Star). Public transit is inadequate, as indicated by the fact that transit ridership per capita in Kansas City is only one-third the average of a dozen other cities of similar size. While there is currently a major effort to improve transit, the region still has no formally adopted long-range transit plan." It is no surprise that the streets are now numbered up to the two hundred range on both the north side and south side of the river. That means there are more than four hundred blocks within the greater Kansas City area in the north-south direction. As the boundary of the city expands, the empty area in the downtown proximity is turning into a no-man’s-land. The rest of these four hundred blocks are occupied by the numerous "edge cites" similar to those defined by Joel Garreau in his book Edge City: Life on the New Frontier. More corporate parks and offices are developing in the suburb area. "Large-scale development projects in the suburban fringe continue to occur. Sprint is building a 200-acre office campus near the southwest edge of the metro area to house most of its 14,000 employees. Harley-Davidson built a new plant at the north edge of the area using tax incentives intended for core city areas. A NASCAR racetrack and 'Land of Oz' theme park are being planned at the western edge of the region." Surrounding the new central campus of Sprint are clusters of apartments and subdivisions that are packed with Sprint employees. Overland Park, Kansas, the area where the Sprint campus is located, is becoming more and more like the company towns of the nineteenth century.

New developments are all concentrating on the green areas of the city. It does not matter if it was old farm land or a golf course, as long as it is right next to another subdivision, it will be developed
into a new subdivision. Among these residential clusters, every once in a while one or two strip mall(s) would be built. There is always a gigantic grocery store and a video rental store. Once the land within five miles of the interstate is fully occupied, the cluster spreads north or south along the interstate and new residences start moving in.

Kansas City was rated first for population density loss between 1990 and 1996 by the Sierra Club. The nonstop construction of the automobile dependent residential subdivisions has created worrying conditions for the city: "Page after page of beige split-levels, raised ranches and walk-outs, notations of 'good' schools, large lots and cul-de-sacs, all in bizarre-sounding developments such as 'Symphony Hills' or 'Paradise Farms.'" 9 Most Kansas Citians believe that living in single-family residential clusters in the suburb equals living the American dream. More and more new home signs and billboards are put up along the side of interstate highways, city roads and country roads. New roads that are called Circle or Terrace are being surveyed everyday. These are the small roads that go nowhere except to the cul-de-sac. With more and more resources being spent on the suburbs, the inner city receives less and less funding.

Similar to the suburb developments in Atlanta, those in Kansas City are also causing traffic congestion and air pollution. Kansas City was also rated number four in the country in the daily vehicle miles traveled per person category in 1996. Even with the presence of these problems, Kansas City is still vigorously developing their suburbs without any fear or hesitation.

Atlanta and Kansas City have presented different levels and different categories of problems caused by urban sprawl to us. The understanding of the conditions can lead us to identify these problems that are hurting other cities and downtown of America.

On the other hand, businesses moving back into the city seem not enough to halt the already developed situation of sprawl. "Even though there is a movement in Atlanta to develop more heavily within the city limits, the suburbs continue to grow. The Mall of Georgia - the biggest shopping mall in the area - is near completion, and the outer counties of the Atlanta metro area are adding more housing all the time." 10
Which statement is true

The economic benefit brought by the unrestricted residential developments in the suburbs is one of the arguments by the people who support urban sprawl. They often threaten that once urban sprawl slows down or stops, many that are employed in the construction industry will become unemployed. In addition, the businesses in related fields, like plumbing supplies and building materials, transportation, will suffer from indirect negative impacts. Also, they make people believe that houses in the suburb are the only kind of houses people want. Everyone in the market to buy a house is looking for a twenty-five hundred square foot split-level on an eight thousand square foot lot. What the developers are doing is providing what the market is asking for.

When people believe the slow down or stoppage of urban sprawl equals unemployment and slow down of related businesses, they are actually accepting the notion that suburban single family houses drive the demand of new housing or even magically create the need for buying houses. While the large number of new houses available in the market does indirectly encourage people to buy, it does not mean that people buy a house simply because they are available. The demand for new houses does not depend on where the houses are built. It depends on the demographics: the population of certain age group, the income level of the population, interest rates, etc. The location of the houses only plays a role after the need for buying a house is generated. Therefore, the demand of new houses and dwellings will not decrease simply because there are less suburban houses being built. If the demand still exists, houses will still need to be built and they do not need to be built in the suburbs. They can be built in the already developed districts in the city or the neighborhood within the proximity of the city. By already developed, I mean the places that already have the necessary infrastructures available, especially those area losing their population due to the extensive migration to the suburbs. In this case, the economic benefits are still available and stay within the city. Contractors will still be employed, only this time probably at a site much closer to their offices and plans. The demand of building materials will be maintained because new houses are still being built. With these arguments available, the ‘slow down of urban sprawl means unemployment and hurts the economy’ statement, becomes suspicious.
It is those who support urban sprawl who state that they are only fulfilling the demands of the market. "Suburban developers say that people want to live and shop in the suburbs and they are just following that desire." In other words, the suburban developers are saying that vigorous development of the suburb is a market driven phenomenon. If this were true, it would further prove that the suburban single-family house does not increase the demand for new houses as was explained previously. They merely act as passive objects that sit on the site and wait to be bought. The demand for new houses and dwellings comes first, caused by other factors, and consequently the houses are built to meet those demands.

**Loss of green space**

"Urban sprawl occurs when more and more green space is commercially developed into suburban housing, roadways, strip malls and industrial parks." This problem affects cities of all sizes. From a large city like Atlanta to a tiny city like Ames, Iowa, cities are losing their green space at an extremely high rate. Ames, Iowa, a place that can barely be called a city, is concerned about its rate of losing farmland. "North Ames is one area that has generated some concern, as construction has taken over large amounts of formerly agricultural land." Even in the place where people would least expect urban sprawl to hit, it still happens. "The photo spreads in the glossy magazines show big skies, tall mountains and miles and miles of nothing. That's the image of Montana we've been given. But like some exotic species of alien plant, urban sprawl is invading, as more people want a home on the range." As people move into the new subdivision homes, they then take away the green space, farmland and natural resources from the rest of us.

"Oregon has the best plan to limit development, and has slashed its annual yearly loss of agricultural land from 30,000 acres to 2,000 acres." According to the land use rating done by the Sierra Club, Oregon is rated moderately effective in state legislation on land use policy and very effective in state involvement within community land use programs, policy implementation tools and field expert input. Iowa is rated the thirty-third of the fifty states. It is rated not effective in legislation, involvement, nor in implementation tools. The
field expert input is rated moderately effective.

Extended hours of commuting

Suburb subdivision housing depends heavily on the automobile for its success. No matter where the residents of subdivisions work, shop, eat and entertain, in the old downtown or in the new edge cities, they still drive to, from and between their destinations. The new suburb housing developments are usually tens of miles away from the downtown area. For a large city downtown, it means tens of thousands of people are driving towards the same area within the two hours of the morning rush hour. The situation is worse when the suburb housing is concentrated in one region, as is the case for modern day American subdivisions. Every morning, people drive on the interstate and head towards the same direction and every evening, those same people drive on the same interstate and head towards the other direction. The express lanes in the middle of interstate 90 and 94 outside of Chicago illustrate this mono-directional driving pattern. During the morning rush hours, these express lanes are opened to southbound traffic, heading towards downtown Chicago. In the evening, the express lanes are opened to northbound traffic, heading towards the subdivisions/edge cities north of Chicago. On the one hand we can see these express lanes as a clever way to reduce traffic congestion. On the other hand, it can be seen as the monument of our ever-sickening living pattern. No matter how we see it, it is definitely not the long-term solution for traffic congestion or our life-style. “For more than 50 years, our answer to more traffic has been to build bigger roads and promote more scattered development, which of course creates more traffic. Americans now waste almost $10 billion per year in lost time and gas, stuck in traffic... States that ranked low ‘were putting too much money into new highways’ said Hohmann, who called that the wrong approach for “putting the brakes on urban sprawl. Unfortunately ... that's a lot like trying to buy new pants to deal with your weight problem,’ she said. ‘It's a short-term strategy but, really, it's not a long-term solution.”

Uneven distribution of a city’s resources

Suburban housing developments take away the funds from the city to develop the basic infrastructure they need. The location of these
subdivisions is usually along the existing boundary of the city they are in, expanding the area that the city is occupying. As the city grows larger, infrastructure is in demand at the outskirts. As new houses are only built in the suburbs, the city core becomes less and less dense and the void becomes larger and larger. Every time a new subdivision is developed, new roads need to be built, new wire and sewage systems need to be put in. These things cost large amounts of money. In order to afford the costs to develop a suburb, cities need to devote more money to suburban development and thus reduce the funding available to the inner city. With less funding, the inner city starts to deteriorate and slowly becomes hostile. This causes more people to move away from the city to the suburbs and increases the demand of resources within the suburbs. "A report released Monday by the environmental group found that 21 states spent over half of their federal transportation dollars on new roads in 1996 and 1997, rather than using the money to repair and maintain existing roads. 'Twelve states spent less than $5 per urban resident on new mass transit construction.' the Sierra Club report said."17

New urbanism has dealt with some of the problems of urban sprawl. However, it has not provided a satisfying result dealing with the unevenly distributed resources caused by urban sprawl. New urbanism still demands fresh pieces of land. The idea is still to develop in an area where new infrastructure can be put in and everything can be built from the ground up.
CHAPTER 2
THE EDGE CITY

The edge city

Despite the many negative aspects of sprawl, some believe the de-centralization of American cities has created a new form of city. In the introduction of Edge Cities and chapter seven of Bourgeois Utopia—Beyond Suburbia: The Rise of the Technoburb, both authors Joel Garreau and Robert Fishman see de-centralization of the old city core as a phenomenon that is logical to the growth of cities. Garreau uses the term "edge cities" to describe the multiple suburban centers along the interstates. Fishman called them "technourbs". The definition of edge city consists of five parts according to Garreau. First, an edge city should have five million square feet or more of leaseable office space—the workplace of the Information Age. Second, it needs to have six hundred thousand square feet or more of leasable retail space. Third, it needs to have more jobs than bedrooms. Fourth, it needs to be perceived by the population as one unique place, and fifth, it had be nothing like a "city" as recently as thirty years ago. Within these five parts of the definition, the edge city is portrayed as the highly successful and self-sufficient new city. However, no matter how successful an edge city has become, it still would depend heavily upon cars. Residents of the edge city would drive to work, drive to shop and drive to entertainment. With almost all the edge cities, there is not any way a person would be able to conveniently move around without a car.

Most traditional cities have a center. Layers of zone that define residential, commercial and industrial areas of the cities surround the center. The edge cities do not follow the layering rule and take the form of a network. There is no clear center but nodes that connect with each other and interact with each other.

When cities were first developed, creating a centrally located core was essential for the cities. People lived in the surrounding rings of suburbs. Cars were not household items at that time so most residents could not afford the time-consuming daily commute. The core of the cities also served as the central nervous system of the cities: people went to the center to work, decisions were made and carried out
downtown, government offices were in the center of the city, cargo went through the terminals in the downtown, and the best department stores carrying the most luxurious products were anchoring the corners of downtown.

The popularization of the automobile among common households and the interstate system eventually reduced the need to live close to work. When families started to own cars, it took a much shorter time to travel from home to work. Another way of looking at it is that people can live further away from work once they own a car. Also, with the government's development of the interstate system, the perception is that it is even faster to get around and go to different places.

The shifting from industrial society to information society further diminished the need for a centrally located controlling system. The introduction of modern communication equipment allows much of the daily business to be conducted remotely. After the introduction and popularization of personal computers and the Internet, many of tasks that require physical delivery and face-to-face meeting can be transferred electronically and take place via digitized image. This means that people have gained even more mobility and freedom in the distance sense and it is more possible to isolate oneself from physical contact with others provided they have access/ownership of the technology.

According to both authors, the majority of Americans are living in the edge cities/technourbs and these edge cities/technourbs overrun the old center of the city/downtown in employment opportunities, population, office space square footages and retail volume, etc. "Between 1950 and 1970, on the average, 1.2 million housing units were built each year. In the 1970s... twenty million more new units were added, almost as many as in the previous two decades."

The success of the new cities was largely due to the freedom Americans gained via telephone, radio, television, automobile and computer. As Americans gain more mobility both physically and virtually, the necessity of a center becomes less. Living close to the city center started to lose its advantages. The cheap and untamed land beyond the existing boundary of the city offered inexpensive solutions to fulfilling the American Dream.

The information revolution has shifted the form of cities.
Instead of being singular center specific, cities now have multiple centers. These centers are the nodes of a network and are connected by interstates, highways, roads, power lines, telephone lines and fiber optic lines, etc.

**Home is becoming a city**

The new cities can now be modeled as a network of nodes that are self-sufficient to a certain degree and begin to take the form of a city. The nodes within the network are connected both physically and digitally.

Within each node, the network structure persists: there is not an obvious center. There may be a popular gathering place. However, it may not be centrally located in the middle of the node and there may not be a ring pattern, like the traditional city form. Therefore, there is not a hierarchical structure. On the other hand, shopping malls, business parks and subdivisions within the node are intra-connected with roads and cable.

Going further into the node, the layout of the buildings and houses also follows another form of network pattern. Roads serve as a central spine and connect each of the houses. Usually, a connection between houses is not available.

It may seem like the entire city has taken on the form of a network. However, from my point of view, the traditional city still exists. It has taken up a much smaller size and has gone digital. People's homes have taken up the form of the traditional city. Layers and layers of obvious and hidden boundaries and fences are protecting people's homes. As well, a highly hierarchical entrance system is in place to guide the entry pattern. Accessibility to goods and services are provided by the Internet.

**Rules of the edge cities**

The new cities, like any other city, have strong implications on how the residents should live. When residents live by all the rules and guidelines, most of the things make sense. One of the guidelines is the ownership of a car. Also, subdivisions seem like the only solution to home ownership. They are perceived as the safe place to live and to bring up children. The most important rule/guideline is the programmed
life style everyone shares within subdivisions. The time people go to work and the time people go to play are the same among most of the residents. When they do not live by the guidelines, their daily lives would involve a great number of inconveniences. Imagine travelling around these “edge cities” without a car. It is for this reason, a careful study and analysis of implications and guidelines is needed to assure they agree with the way people live.

When we look at the definition of sprawl, the two main problems of sprawl are contained within the low density and the automobile dependency. As explained in the case of Atlanta, the low density growth occupied open space at a fast speed. The reason for the low density is due to the lack of dependency on physical locale. This prompted the residents’ desire to maximize their privacy and the size of their properties. There is no need to be “close to their neighbor” anymore. As people are spreading only horizontally, wanting larger yards around their houses, public open spaces disappear quite quickly.

Whether the automobile boom helped the development of the edge cities or these edge cities promoted the automobile industry, these edge cities and automobiles are inseparable. Other than the functionality of the automobile, the freedom the automobiles provide fundamentally changes the way Americans live. The need of a centralized zone, which is basically at the center of a city, has become obsolete because of the minimum dependency on public transportation in modern day America. Citizens are free to move about everywhere that they want, provided they have access to an automobile.

According to Garreau, this is the new form of living for Americans. In Edge Cities, he concentrates on discussing the suburban commercial establishments. He believed that these commercial centers are the new city form for America because of their size (physical size and population) and economic power. However, he avoided two main elements in the suburb. One of them is the suburban residential development. Garreau took the suburbs almost as a given condition because of the large population living there, without considering it critically. The second element is the car. These edge cities depend heavily on automobiles. Even without considering the hazards against the environment, intensive dependency on private automobiles would lead to a reduced quality of public life and create a programmed lifestyle,
which shall be described in later part of the thesis.

In his book, Joel Garreau mentioned one of the goals of AT & T for relocating its headquarter to New Jersey is to be within twenty miles of their employees’ home. The goal is definitely an honorable one. However, this goal is still based on the assumption of an automobile oriented city. In AT & T’s plan of achieving this goal, it assumes that every employee owns a car and drives to work. The distance is a maximum of twenty miles. This twenty miles, again, is traveled by tens of thousands of workers everyday within a two hour range in the morning and again in the evening. From the traffic stand point, the edge city is no different from the old downtown, unlike what Garreau suggested. It is only relocating part of the downtown traffic chaos into the new frontier. “Getting people from place to place in sprawl-choked communities is costing us dearly. Once the concern of a few big cities, massive traffic jams have become commonplace across the country.”

Business headquarters in the edge cities are surrounded by parking lots and a thin layer of trees. Behind the trees, there is usually a huge parking lot, accommodating the hundreds, if not thousands, of workers. These parking lots show the dependency on automobiles clearly. The problem with the business headquarters is not that they are far from each other. Their problem is that in order to get from one building to another buildings people need to get into their car and drive over there. Sometimes, the distance is less than five hundred yards. This degree of dependency on automobiles is contradictory in the modern day society when the rest of the world is trying to conserve energy.

For most homebuyers, subdivision homes may seem like the only option. New residential developments are rising up in most cities in the United States. The Sunday newspaper in most cities has a real estate section. Within the section, readers see picture after picture of subdivision split-level, story and a half, two story, ranch and raised ranch homes. New home signs are everywhere along the highway and country roads. The rapid growth of the suburban housing development indicates a strong economy and a strong demand for new houses. However, it seems there is only one way to meet the demand: subdivision homes.

In the advertisements of subdivisions, there are always images of
the front yard with neatly trimmed grass and a gable roof house with freshly painted siding of one of the "off-white" colors. Besides showing off the large building size and number of rooms and bathrooms, the introductory text usually emphasizes the proximity of the subdivision to entertainment, restaurants, shopping malls, major office parks and downtown. They are usually within thirty minutes range, driving of course. Together the pictures and the text introduce the "perfect" place to live, raise children and retire. These pictures paint an illusion of utopia that many longs for.

"The skyline is slowly shrinking in the rearview mirror. You have just passed the Tri-State Mall. Keep a watchful eye for the exit signs and try to remember the directions: Take a left, go under the highway, go right at the third traffic light, go two miles and turn in at the stone gate, just past the school (if you see silos on the left, you've gone too far), take the loop road to the right, look for the signs to the 'Estates'. We're number 36, the blue one with the window boxes. Just come around back—we'll be there. You all know the place; you've been there many times before. One hundred million of us live here and millions more aspire to residence. We are in the suburbs." The problem of heavy automobile dependency also happens in suburban residential areas and it causes more than traffic congestion. More and more people are working in the suburban business parks. Although the business parks are closer than the old core of the city, the people still need to drive to work. The driving, as described earlier, causes the same traffic congestion as the old suburb-downtown traffic problems. Other than the daily commuting to and from work, handling the day to day tasks of grocery shopping, picking up dry cleaning, banking and dining also depends on the car. Among the busy daily routine of going to work and going home, it is very difficult to find time to do all the daily tasks. Therefore, most people arrange their schedule to have those tasks achieved during the weekends. Saturday now becomes the big shopping day. People need to go to the grocery store to buy two hundred dollars worth of groceries. Then, they would go to a department store to shop for the daily items and wait in long check out lines. After that, they still need to go to the bank to take care of their accounts, go to the mall to shop for clothes, shoes, toys, etc, and most importantly, go to the movie rental store to rent videos for their
Saturday night entertainment. Although we are being told shopping in the mega-stores saves us time, it actually increases the time we spend in each store. In order to get the shopping done; we need a strategy plan--which store to go to first, which is second and what we are going to get in each of them. After we figure out the perfect plan, we follow the plan week after week, month after moth, year after year. Suburban life style not only causes traffic congestion during the rush hours, it also create traffic during the weekends. “Transportation consultant Alan Pisarski says that driving other than commuting takes up more and more driving time and is causing more and more traffic problems. He says that 11am on Saturdays, when people are running errands, may be one of the heaviest traffic times.”21.

Although we are getting tired of sitting in our cars hour after hour, we still do it whenever we need to go somewhere. However, when we think about it, the driving itself is not really necessary. We think it is necessary because our city is designed for automobiles instead of people. Roads are connecting every single parking lot, no matter if it is the twenty-car parking lot in front of Burger King or the thousand-car parking lot in front of the giant shopping mall. In the edge cities, sidewalks are not even complete. They are broken up by driveways, roads or patches of grass, which we come to recognize as a "good" thing to have. Sidewalks are there just to fulfill certain requirements. The presence of them on one block does not guarantee its existence on the next block. Therefore, most people drive even when their destination is well in sight and only one quarter of a mile away. It is not that people are unwilling to walk, but it has become too dangerous for both the pedestrians and the drivers.

Sprawl or new cities

The definition of sprawl mentioned above, when combined with the data Garreau and Fishman provided, requires some adjustments. The low density and automobile-dependent aspects are accurate descriptions of the edge cities. However, as the data points out, the edge cities are no longer depending on the services and employment opportunities of downtown. Therefore, the definition for sprawl becomes "low-density, automobile-dependent development in areas where automobile oriented thinking is the norm of people’s daily life."
Sprawl and new cities are essentially the same thing. They are two different views of the same issue. They propose different scenarios and different solutions. Sprawl proposes the problematic aspects of suburban development. New Cities suggests the logical aspects of suburban development. No matter how the issue is being viewed, the problem still lies within it, the heavy dependency on privately owned automobiles.

On the other hand, there are the old downtown and the surrounding residential area that have the necessary infrastructure to become less automobile dependent and more pedestrian oriented districts. With a pedestrian oriented district and the proximity of the supporting infrastructure, residents can live a more vibrant and spontaneous lifestyle. This kind of urban lifestyle is what is missing from the modern suburban lifestyle in America. It is missing not because people do not want it anymore. There are many cases that we can see how people desire urban settings. In the Country Club Plaza area in Kansas City, there are lots of people throughout the day and evening. The crowd gets larger during the weekend. Even during the wintertime, people go there, walk around and shop. There are also many other examples around the nation which clearly show the desire for urban experience by the people, like the Brookside area of Kansas City, Riverwalk area in San Antonio and the French Quarter area in New Orleans. Besides these physical places, we can also see the same desire through people's fondness of the Internet. The virtual world does not only provide high speed and great convenience to people, it also fulfills their desire for urban experience. The suburb is not providing those experience and it is understood as a trade off for a "better" and "safer" community to live in.
CHAPTER 3
LEARNING FROM THE DIGITAL WORLD

There goes the community, here it comes again

One of the arguments of anti-sprawl campaigns is the loss of the sense of community, residents do not know their neighbors, and people isolate themselves from others. This statement may be true to some degree. However, communities have definitely not been lost. They exist in a new form. Traditionally, we think of community as a group of people who live in the same area who share a common interest in their neighborhood. According to the Oxford English dictionary community means "the people living in one place, district or country, considered as a whole." This is a location-based community. This is the kind of communities that are lost. The reason for the loss is that people do not see the need for a location-oriented community and people do not have the opportunity to form a location-oriented community due to the dispersed environments suburban housing impels. Although location-oriented communities are lost, there is another type of community already being formed.

The introduction of radio, telephone, automobile, television and the Internet help the formation of new kinds of community. Instead of being location based, the new communities have become task and interest based. People now have the freedom to drive to a distant location to meet with friends who share the same interests. With the introduction of interest groups and clubs on the Internet, the need of location based communities becomes lessened. In a sense, communities have taken up a new form. For example, interest and task based communities; people who enjoy collecting stamps may go to conventions or meetings for stamp collectors. People who enjoy import motor sports may go to car shows or races. These people become friends and form into a community while they may not know their next-door neighbors at all. Adding to the effect, the automobile-oriented environment also reduces the chances for location based communities to form. When suburbanians need to go out, they can easily go through their kitchen into the little foyer at the back of the house, go to the garage and get in their car. The garage doors are remote controlled so there is no need to get out of the car to open and close the garage door. It takes maybe three minutes to
drive from their house to the front gate of the subdivision. On the way, they may pass their neighbors in another car going out. They may, then, wave at each other and go their own way. Living in this kind of environment, the chances of meeting neighbors are being reduced to a minimum. Location based communities cannot be formed when neighbors do not meet each other. Although some suburban gated-communities may have regularly scheduled neighborhood meetings, it is not effective in helping to create a sense of community. That is because the sense of community partly comes from meeting neighbors in an informal setting: no one organizes a meeting, no one is expected to be somewhere at a certain time. People just run into each other and talk to each other because they are concerned or simply because of good manners. However, when the environment is designed for cars and driving, as most suburb subdivisions are, the circumstance of neighbors running into each other has the slightest chance to happen.

The car and driving environment suppresses the formation of location based communities. The information/internet technology allows people to meet and form other kinds of community. This helps the formation of the task and interest-based community and the change of lifestyle of the people that will be discussed in the next section.

**Digital resident, automobile resident**

Before digital technology was widely available, people depended heavily on their living environment, the sense of belonging to a group, community, city was essential. Due to limited mobility, communities were formed among people living in close proximity.

As a newer and faster transportation system was introduced, people gained wider mobility and could afford to leave their physical community and form other kinds of communities with people not necessarily sharing the same zip code.

The popularization of the private automobile has created, what I call the 'automobile residents'. An automobile-oriented environment implies a different living order to the public than a pedestrian-oriented environment. When cities, roads, offices, banks, stores and residences are designed with the automobile as the focus, it is difficult to live without a car. The effects of this kind of residency has been discussed earlier. The gaining popularity and accessibility of
the Internet allows an even more flexible kind of residency and creates the ‘digital residents’. Through the Internet, people can find others who share the same interests and yet may live thousands of miles away. The digital residents can do their grocery shopping, banking, bill paying and even working at home through the Internet.

At first, the automobile residency and the digital residency seem to agree with each other. Both of them allow people to live a more isolated lifestyle. However, when being looked at closely, there are some significant differences between the two. First of all, the digital residency is replacing part of the automobile residency. The convenience brought by the Internet eliminates some of the needs of driving. Second, automobile residency is in contradiction with pedestrian culture whereas digital residency is not. When driving is the mentality of everyday life, pedestrian life is logically at its lowest. However, although ease of shopping online may reduce the number of times people go out, it does not eliminate going out, it does not eliminate the pedestrian experience. When considered closer, digital residency shares some of the qualities of the urban pedestrian experience.

**Logic of the residency**

With the advancement of technology, many aspects of life are becoming more convenient. People can carry out many tasks, via telephone, television and especially the Internet, without leaving their home. Although a computer is not as common a household appliance as a telephone or a television set, it is gaining popularity among the general public as its price is dropping constantly. According to the US Census Bureau, “in America, more than one in every three household owns a computer.” It is easy to see that eventually Internet access shall be as common as access to a telephone. Along with the enrichment of the features of the Internet, it is not difficult to see how a home may become a privately owned small city.

The Internet interfaces between the city and the home. Functional communication between the city and the home happens via the Internet, therefore, it brings the city to the computer screen of the inhabitants in the home. Activities that required going to the city can now occur inside the house, on a screen.
The digital city is significantly different from the automobile city. The digital city has fewer confinements on its residents and allows for spontaneous ideas, activities and decision making. People can go to a toy store early in the morning, during lunch hour, in the evening or late at night. The main reason the Internet allows spontaneity is the short amount of time it takes to go from one place to another.

The automobile city and the digital city imply lifestyles. The automobile city implies a programmed and routine lifestyle. The digital city implies a fast paced, vibrant, urban lifestyle. The lifestyles we live in the physical city suffer strong impact form both the digital and the automobile city to different degrees. How we design our physical urban environment determines which kind of city and lifestyle it would concur with.
CHAPTER 4
POTENTIAL OF AMES

Ames

Ames is located in central Iowa, about thirty miles north of the Iowa State Capital, Des Moines. They are connected by Interstate thirty-five. Ames has a population close to fifty thousand. About half of its population is comprised of students attending Iowa State University.

Ames is a hybrid of a city and a suburb. It can be considered as a remote suburb of Des Moines as Ames still depends on Des Moines for employment and goods. According to the Census, there are 52 people living in the downtown area of Ames that drive forty to fifty-nine minutes to go to work. It is safe to assume that most of these people work in Des Moines. Also, the weekend trips to Des Moines when the weather is nice clearly indicate Ames’ dependency on products from Des Moines. However, this dependency is bi-directional. Des Moines also depends on Ames for cultural events, consumers and some conventions. At the same time, Ames has more than one hundred years of history and has developed into a small city unto itself. There is a well-defined downtown area that is starting to expand by converting some of the outer areas into suburban housing areas.

Although Ames, Iowa is not on the list of the thirty most sprawl-threatened cities, it is experiencing the very beginning of suburban migration. In the local university newspaper, Iowa State Daily, there were some articles expressing concerns about the ramifications of urban sprawl. “Urban sprawl trend hits north Ames”, “Central Iowa counties plan to create greenways” and “Urban Sprawl” are three of the examples of the articles.

Demand of new residential development

When we start to look at the overall development in Ames, it is not difficult to see that there is the need for more residential lots. The northern, western and southern boundaries of Ames are constantly, although not at a great rate, expanding. In all of these three areas, the expanding boundaries are caused by new residential developments. When we look at the zoning map of Ames (Figure 1, Figure 2) it is easy
to identify the new residential development and their location. If developers continue to build in these areas, it suggests they continue to see profit by building in these areas. Likewise, that also implies there is the need for new residential properties.

The demand for new houses does not seem to be caused by the same reason as in the larger cities. However, the impact and consequences they bring to the community are essentially the same. Many residents of Ames admire the newly built and trimmed houses at the border of the city and are moving away from the city core. Therefore, the migration to the edge of town is a trend rather than a need. This trend causes the city limit to expand and the expansion of the city limit generates concerns regarding the loss of farmland.

Figure 1: 1997 Long Range Project Map of City of Ames, Iowa

Figure 2: 1997 Current Range Project Map of City of Ames, Iowa
There is also a strong demand on rental units in the downtown area (Figure 3). Unfortunately, a large portion of the area is under the single-family conservation overlay. This restriction prevents potential renters from moving into this potentially more vibrant area.

Non-conforming conditions

The zoning ordinance of Ames, Iowa classifies some of the lots in the downtown Ames residential area as "non-conforming lots". In this project, I am focusing on the downtown area bounded by Lincoln Way on the south, Thirteenth Street on the north, Grand Avenue on the west and Duff Avenue on the east. According to the zoning ordinance non-conforming lots are defined as "a vested nonconforming structure is nonconforming by reason of restriction on area, lot coverage, height, yards, or other characteristics of the structure and its location on the lot". Non-conforming lots constitute twenty-one percent of the residential lots in downtown Ames. Most of them are the result of subdividing the existing one hundred and twenty feet by sixty feet lots. On these smaller lots, the buildings are still required to conform to all the set back and side yard rules. All of them are smaller than the required minimum lot size of six thousand square feet.

<table>
<thead>
<tr>
<th>Census Tract 09: Block Group 02</th>
<th>Most 1 bedroom apartment rent from $300 to $500.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Most 2 bedrooms apartment rent from $300 to $500.</td>
<td>Most 3 bedrooms apartment rent from $500 to $750</td>
</tr>
</tbody>
</table>

218 rental properties

| 44 1 person rental units |
| 107 2 persons rental units |
| 28 3 persons rental units |
| 22 4 persons rental units |
| 9 5 persons rental units |
| 8 6 persons rental units |
| 524 rental properties |

Figure 3: Rental Condition of Story County, Iowa, Tract 9, Block Group 2
There are four different conditions of non-conforming lots categorized by two previous students who worked on this project. The diagrams following explain these four conditions and compare them with the normative conditions. (Figure 4, Figure 5, Figure 6, Figure 7)

The first condition is called Double Intersection (Figure 4). This is when a street corner lot is subdivided into smaller lots and becomes non-conforming. The second condition is called Narrow Adjacent (Figure 5). This happens when a lot is subdivided longitudinally and becomes two narrow and long non-conforming lots. The third condition is called the Single Interior (Figure 6). This is when an interior lot is divided into two smaller lots but only one of them becomes non-conforming. The fourth condition is called the Double Alley (Figure 7). This is when two normative lots by the alley are subdivided into smaller non-conforming lots.

1. Double intersection

![Figure 4: Double Intersection]
3. Narrow adjacent

Figure 5: Narrow Adjacent

3. Single interior

Figure 6: Single Interior
History of the non-conforming lots

The reason these lots exist in the first place is most likely due to the need for more residential lots and the need for smaller and less expansive lots.

Traditionally, the residential properties are built on lots that are about sixty by one hundred and sixty feet. After the requirements for the yards, there is still more than enough space for two single-family houses to go onto one lot. Throughout the development of the city of Ames, people were also aware of this condition. Therefore, some of them divided their properties into smaller lots. Some of the lots were divided into two almost square lots while the others were separated longitudinally, into two very narrow lots.

As these lots continue to exist and the zoning code change and require all the residential lots to occupy at least six thousand square feet, the lots are classified as non-conforming lots according to the existing zoning code. The zoning code states that if sixty percent of the non-conforming property becomes destroyed, the property shall not to be rebuilt, unless it conforms to the existing zoning code again.
The non-conforming lots are viewed as irregularities of the district and need to be reverted back, to conform to the other seventy-nine percent. By looking at the condition from a quantity standpoint; the non-conforming condition is the minority condition. Thus, it should be made to conform to the majority, assuming that uniformity will have a positive impact towards the district. When thinking about the condition from the quality standpoint, both the conforming and non-conforming conditions need to be compared with each other, in order to make the final verdict.

The advantages of the non-conforming lots

The historic conforming lots were subdivided because there was a need for smaller lots. A smaller sized lot requires the land to be used more efficiently (Figure 4: Double Intersection, Figure 5, Figure 6, Figure 7). Buildings are built much closer to the property, yards are more thoughtfully located on the property, the entrance is more direct and the parking is more creatively handled. These are all features that enhance a more pedestrian oriented area. One may argue that the non-conforming properties do not appear to be much different from the conforming ones. However, one difference is that the non-conforming properties are much closer to their neighbor and take up a bigger portion of the lot. This allows more opportunity for interaction between neighbors.

The misuse of the zoning ordinance towards the non-conforming lots

The existing zoning code is designed for much larger and conforming lots. Although non-conforming lots are being classified as non-conforming, they are still required to follow the setback rules in the zoning code. This does not seem to be logical. By following the zoning code designed for much larger lots, the non-conforming code becomes the abnormal cells in the districts. In order to exist in the community of larger lots, the smaller non-conforming lots are transformed to look more like the rest. However, the nature of these non-conforming lots is fundamentally different.

The differences of the non-conforming lots and the conforming lots can be realized by comparing the downtown Ames area to suburb subdivisions. If the non-conforming lots do not exist, the downtown
Ames area would basically follow the same network structure as suburb subdivisions. All the houses would depend on the north-south bound streets for access. The east-west bound streets would be responsible for connecting between blocks (Figure 8). However, the non-conforming lots presented a new twist to the network structure. Some of the non-conforming properties use the east-west bound streets as the main access roads (Figure 9). This proposes a more dynamic network structure, which alternates the specific usage of the roads and provides a more flexible environment implication.

Figure 8: Street Dependency under 100% Normative Condition

Figure 9: Street Dependency under Non-conforming Conditions
However, the model with the non-conforming lots still depends on two sets of major streets to act as the major connecting device between each house and between each block (Figure 9). This dependence still has many limitations. Under the proposed condition, the widened alleys become one way streets to access the garages and parking spaces on the back of the lots. Therefore, the alleys become the primary access streets and the existing street becomes secondary acting as connection between alleys and the major roads (Figure 10).

Figure 10: Street Dependency under Proposed Conditions
CHAPTER 5
PROPOSAL FOR DOWNTOWN AMES

The intention of the proposal

The intention of this design proposal includes the following. First, the design takes advantage of the unique condition in the downtown Ames residential area. Second, the design uses the digital network as an analogy. Third, the design suggests an alternative way of housing. Fourth, the design provides a vibrant pedestrian oriented, less automobile dependent community. The non-conforming lot, although being seen by the city government as an illegitimate condition, provides the area with much potential to alter the existing living pattern to accommodate the needs of people in the information age. The digital network attracts more and more users and provides an environment that allows spontaneous and flexible lifestyle and the digital network is a good resource to inform us about how people like to live and thus the design of the proposal.

The physical city that we live in follows the logic of an automobile city. In order to concur with the digital city, the physical city requires some reconsideration effort to determine its future. Because the virtual world is so appealing to many people, there must be some aspect of it that is valuable that we can use to inform neighborhood design. Therefore, by understanding the virtual world, we can determine where the physical world needs to be heading so the two worlds can be corresponding to each other. This proposal is to suggest a way of living that corresponds to and develops a place that supports the digital world's flexible and spontaneous lifestyle.

Within the suburban lifestyle, there is a strong dependency on the automobile. An automobile oriented society leads to a programmed lifestyle for the residents. Therefore, designing a pedestrian oriented district is important to the proposal. A high-density pedestrian oriented area corresponds much more to the vibrant digital world. When people surf on the Internet, they experience a fast pace and engaging atmosphere. They can go from one online store to another in seconds, just by clicking a few buttons. In a high-density pedestrian oriented district, a similar kind of fast pace and engaging atmosphere exists. An automobile oriented district cannot provide this kind of atmosphere.
because the act of getting back into the car and driving to the next store breaks up the continuity of the experience that the Internet and a high density pedestrian district can provide. At the same time, the alternative housing scheme would hopefully prevent Ames from suffering any further harm from sprawl, while maintaining a healthy growth by rebuilding in the older neighborhoods. Furthermore, the proposal would hopefully inspire a new way of understanding housing, houses and the impact of digital networking on people's lifestyle.

Densification

The downtown Ames residential area, within the proximity of the downtown shopping/commercial area and the hospital, is a potential area for a vibrant pedestrian oriented district. In order to realize this potential, the number of dwellings should be increased (Figure 1.1). This would mean an increase of population in the district. Doubling the number of houses in the area can provide density and a variety in the population mixture. With a more vibrant district, downtown Ames shall act as an alternative to the suburb and provide a different kind of lifestyle. Therefore, it is important that the proposal recognizes the capacity potential the non-conforming lots are suggesting. There is more than adequate space to build two houses on one lot. Densification of the residential area in downtown Ames may ease the high demand on the subdivision homes. However, to make the plans work, some of the zoning requirements and other institutionalized patterns and habits need to be changed to better utilize the smaller but more efficient lots.

Although the number of houses is doubled, privacy and private space should be kept for the residents. The extra space that is needed to accommodate one more house on the property is primarily coming from utilizing the space wasted on the front yard and side yards under the existing zoning conditions, rather than squeezing houses together.

In order to design for a vibrant area, like the one in Ames, the proposal shall allow the building of rental units. The increased number of rental units provides the chances for more university students and elderly tenants to move into the area thus creating a mix of population for the area. The existing conditions for rental units and non-single-family structure was pointed out earlier in the thesis. By
accommodating those conditions, the higher density also help Ames downtown to realize its potential.

Ames’ downtown was built earlier than the automobile was available. Therefore, it has maintained a pedestrian oriented environment, although this environment is slowly fading away. Compared to other parts of Ames, its sidewalk width is much more generous. The facilities found at street corners and next to the sidewalk here do not exist in other parts of town. The potential for downtown Ames to become a vibrant, network like area is far greater than any other part of town.

Existing condition of half of a block. One house and one garage per normative lot. A non-conforming lot is shown on the right.

Non-conforming lot being rebuilt and one normative lot are being rebuilt to accommodate two houses on each lot.

Accessorize and formation of outdoor living space for the two proposed lots.

More normative lots are being built to accommodate two houses on one lot.

Density of half a block after the proposal has been fully realized.

Figure 11: Figure Ground Diagram Showing the Density Change
Although the density should be increased, people should not be forced to live in an apartment setting, as if they are living in the 18th century core of the city. Modernity has brought along the need and expectation of privacy and privacy should be respected in a modern society. More importantly, contemporary social trends call for an independent life style. It is illogical to ignore the trend and contradict it with apartment buildings, which function more appropriately in other more dense cities.

The rental units do not need, nor should they be in a complex or a multi-story building. One of the important features of the area is the single-family-ness and this shall be respected. The single-family-ness, being called that, does not refer to the family structures of the residents of the area. Rather, it is characterizing more pedestrian scale architecture and the privacy of the individual building. Therefore, included in the proposal is the condition that no building shall be taller than the existing houses and no building shall be without a private green space. A better term to describe these kinds of houses would be private dwellings. If an even higher density should be desired, apartment buildings would be allowed along sixth and seventh streets, closer to the main street shopping and commercial area.

The street house, alley house model

The diagrams below show the structure of the living, housing, households and families of the site (Figure 12, Figure 13, Figure 14). The Street-House/Alley-House model allows flexible configuration to accommodate these different structures and needs. At the same time, the model maintains the single-family (may not be called single-family anymore because of the different structure of households) configuration, privacy and private green space for the residents.

Walking around the site, it is not difficult to see the presence of some duplexes. Their presence indicates the need for rental units and more importantly, the potential benefit of building two houses on one lot. In the proposal, this potential of the property is being fully realized. In the proposed plan, there are two houses on each lot (Figure 15). One is sitting in the area previously used as the front yard, close to the sidewalk and the street; this is called the Street House. The other house sits in the back of the lot with the parking
Census Tract 09: Block Group 02

7 65 years and over live in family household with relatives

23 children living with mother only, whose mother is not in the labor force.

28 female householder with no husband present, with own children under 18 years

21 65 years and over live alone.

116 rental housing units occupied by 25-34 years old.

47 rental housing units occupied by 15-24 years old.

Figure 12: Living Conditions, Story County, Iowa, Tract 9, Block Group 2

Census Tract 09: Block Group 02

122 families with related children under 18 years old.

87 families w/ both parents and above poverty level.

7 families w/ both parents but below poverty level

0 families w/ father only for neither above or below the poverty level

8 families w/ mother only and they are all below the poverty level

Figure 13: Family structures of Story County, Iowa, Tract 9, Block Group 2
<table>
<thead>
<tr>
<th>Census Tract 09: Block Group 02</th>
</tr>
</thead>
<tbody>
<tr>
<td>205 householders &amp;</td>
</tr>
<tr>
<td>156 spouses</td>
</tr>
<tr>
<td>180 children</td>
</tr>
<tr>
<td>34 persons live with relatives</td>
</tr>
<tr>
<td>More than 1 person per block</td>
</tr>
<tr>
<td>29 persons live with</td>
</tr>
<tr>
<td>non-relatives in a family</td>
</tr>
<tr>
<td>households</td>
</tr>
<tr>
<td>1+ children per married</td>
</tr>
<tr>
<td>couples</td>
</tr>
<tr>
<td>Families renting out rooms to</td>
</tr>
<tr>
<td>non-relatives.</td>
</tr>
</tbody>
</table>

Figure 14: Living Structure of Story County, Iowa, Tract 9, Block Group 2

garage/carport right against the alley. This house is called the Alley House. This model is similar to the duplexes. One major difference is, instead of being attached, the Street-House and Alley-House are two separate homes. This way, there is not a common wall that is shared by the two houses. This helps to maintain a higher degree of privacy for both residents of the houses. Also, instead of being in a side by side relationship, the two houses are in a font and back relationship. The lengths of the houses vary from house to house and lot to lot. There is no need to make them into twin buildings like the complexes do. This model not only can utilize the space on the lot and densify the area, more importantly, it also provides potential to accommodate the diversified family structure of a modern day university town. The range of people these lots can accommodate includes the typical single family, extended families living together, divorced parents with children, retired couples with rental tenants, etc. With the denser lot and rental houses, a larger variety of people can afford to live in the downtown area. Thus, a diversified community and vibrant area will be established.

As this model arises, there are several concerns that emerge throughout the process. One major concern was that privacy would be diminished. Although, the street house is closer to the sidewalk, the privacy of the house is not sacrificed. Only the most inefficient privacy feature is taken away which include the wasteful front yard and inefficient narrow side yards. Because the alley house is located on
the back of the lot, a common access entrance is set up in the middle of the block. Beyond the common entrance, there are walkways that lead to each alley house on the block. In this model, only two off-street parking spaces are provided for each property. One reason for this is to reduce the dependency of the residents on automobiles. The other is to encourage on street parking, which shall contribute to the formation of the pedestrian zone on the site.

Figure 15: Front House/Back House

Parking

In the proposal, the alleys are assigned to be one-way streets. They are also widened from nineteen feet to twenty-five feet to allow the parking garages or carports to be against the back property lines of the lots. Access to the parking is through the alley in the middle of the block. This way, the driveway from the street to the garage on each property can be eliminated. Besides generating more usable space, it more importantly eliminates most of the collision zone between the driveway and the sidewalk, thus reducing the interference of the automobiles towards the pedestrians. The number of off street parking is reduced to one per house from the current one and a half parking space per house. According to the Census information regarding the downtown residential area in Ames, the current parking need is lower than the requirement of the zoning ordinance. The figures show the driving and car ownership pattern which all indicate a lower than one point five off-street parking per house need (Figure 17, Figure 18, Figure 19).
Besides the off-street parking, more parking is available in the form of on-street parking on all four sides of the block. As most of the other pedestrian oriented districts, on-street parking is an important feature. There are several benefits of having on-street parking. With more cars parked on the street, it denotes the practice of on-street parking on the site, encouraging people to be on foot instead of spending fifteen minutes to find the closest parking space to their destination. In addition, the parked cars on one side and the fences on the other side form a pedestrian zone envelope, increasing the sense of belonging for the pedestrians. Besides helping to define the other side of the sidewalk, it narrows down the road, forcing the cars to drive at a slower speed, in turn, producing a safer environment for the pedestrian and hopefully, encouraging more people to walk to the nearby stores and grocery.

Figure 16: Proposed Parking & Car/Pedestrian Intersection Pattern
Census Tract 09: Block Group 02

- 58 persons go to work by bus
- 36 persons go to work by bicycle
- 50 persons go to work on foot
- 14 persons work at home
- 160 persons = 18.5% population does not drive to work
- 110 people carpool
- 270 persons = 31% population does not drive alone

168 housing units with 1 vehicle

Figure 17: Means of Transportation, Story County, Iowa, Tract 9, Block Group 2

Census Tract 09: Block Group 02

- In average, Almost 7 persons does not drive to work in each block
- More than 2 persons per block walk to work
- More than 2 persons per block take the bus to work
- More than 1 persons per block ride their bicycles to work
- Almost 5 persons per block carpool
- More than 11 persons block does not drive alone

Figure 18: Average driving pattern, Story County, Iowa, Tract 9, Block Group 2

Census Tract 09: Block Group 02

- 0 housing unit with 1 room
- 7 housing units with 2 rooms
- 40 housing units with 3 rooms
- 98 housing units with 4 rooms
- 65 housing units with 5 rooms
- 74 housing units with 6 rooms
- 67 housing units with 7 rooms
- 15 housing units with 9 or more rooms
- 17 housing units with 0 vehicle
- 168 housing units with 1 vehicle
- 121 housing units with 2 vehicles
- 40 housing units with 3 vehicles
- 7 housing units with 5 or more vehicles

Figure 19: Vehicle/Room Ratio, Story County, Iowa, Tract 9, Block Group 2
Private green space

In the proposal, the importance of the private green space is being recognized. It is extremely important for the designer to provide outdoor green space for the residents. One of the reasons for people to move away from downtown to the suburbs is the relatively larger area of green space. If the green space in the proposal is given up to accommodate the higher density of houses, it is likely that people would have less desire to live in the area, thus, contradict the intention of the proposal.

The way it is being done is closely related to the layout of each property. The number of houses on each property is increased from one on each property to two on each property; a more efficient use of space is needed. Under the existing condition, the front and side yards are under used space (Figure 20). Under the existing conditions, the front yard is mostly left alone except the occasional bicycle riding by some small children. The side yards are mostly used to plant bushes to separate between properties. Having both the front house and alley house shift from the center to the edge of the properties, merges the two side yards together. The street house is also sitting right against the front property line (Figure 21). This way, owners can take advantage of the length of the property. The houses, rather than having a thirty-five to forty feet wide front, are thirty feet wide. Because of the increased length of the house, the overall size of the houses is maintained. This increases the width of the joined side yards to thirty feet. Not only does it increase the area of the outdoor green space, it also increases the distance between neighbors. Therefore, it does not decrease privacy for the residents. Also, most of these houses' basement extends to three feet above the ground. This makes the window height taller than the normal vision plane of the pedestrians. There is more than physical distance that controls and promotes privacy: the light intensity of the two spaces, the reflectivity of the glass on the windows, and most importantly, the exposure of the private space. The more open a space is, the less interest and sense of satisfaction people get from knowing the “secret” inside the space.
Between the street house and alley house, there is also a small green space acting as the entrance space for the alley house and as the connection between the large green spaces on each side (Figure 21). For people that to go to the alley houses, there are several entrance
points on each block. On both the eastern side and western side of the block, there is an entrance point in the middle of the block (Figure 22). This entrance will let people into the green space. Within the green space, there are pathways that lead the people to each alley house. Since these pathways go through the whole block in between the street house and alley house, they link all the private green spaces together in each block and make them seem like a large communal green space. At the same time, they act as the dividing device for the private green space of each house, creating a sense of ownership and privacy. On each end the path, which is located on the north and south sides of the block, there are also entrance points for those who parked on the north and south sides' on-street parking. After entering through these entrance points, the people take the same path as the ones who enter through the east and west sides of the block.

From the research of existing conditions, the one aspect that keeps appearing in the same form but under different names is the space created in between the exterior accessories of the houses (Figure 23, Figure 24, Figure 25, Figure 26, Figure 27). Most of the existing houses are in the form of a box. With the simple boxes, the spaces in between them are relatively boring. However, most of the houses are also equipped with quite a few accessories/add-ons. For instance, most of the houses have a front porch. Some of the front porches are covered whereas others are simple platforms that connect the ground and the raised entrance door. On the side and the back of the houses, there are usually other accessories like a cover for a back door, a second floor wood deck with stairs going down to the back yard, an attached storage unit, wood benches and bushes. It is in between these accessories, where the more interesting and personalized space happens. These spaces define the character of each property. Without these spaces, the boxes can generate no interest to the neighborhood at all. It is for this reason that the design of the houses also pays extra attention to the creation of this kind of space. In this proposal, rather than looking accessories being attached onto the box, they are being viewed as the extension of the interior space into the exterior. Therefore, all the exterior accessories are implications or extensions of the space inside.
Figure 22: Entrance locations under the proposed block condition

Figure 23: Existing Condition (Negative Space)
Figure 24: Existing Condition (Extension Space)

Figure 25: Existing Condition (Interlock)
The vertical space dividers interface (the fences)

In the proposal, the intention is to maintain the separation between the two types of spaces and to expand the definition of a fence. This element separates the private space from the public space clearly and increases the sense of ownership. With the recognition of the presence of two different spaces, it is impossible for a fence to act only as the barrier. It also has the potential of being designed to act as the interface between the two spaces/inhabitants of the two
spaces.

Interface

(n) Something that connects two separate entities. For example, a user interface is the part of a program that connects the computer with a human operator (user). There are also interfaces to connect programs, to connect devices, and to connect programs to devices. An interface can be a program or a device, such as an electrical connector.

(v) To communicate. For example, two devices that can transmit data between each other are said to interface with each other.

To break away from the singular linearity, one of the changes proposed is to increase the thickness. A wider fence allows more usage. Pedestrians can lean again the fence, sit on the fence, gather around the fence and move through the fence. This can happen as the width of the fence starts to blur the arbitrary property line. To date, these are some of the limited and obvious uses.

Once the widths of the fences are adjusted, there are at least two more aspects that can and should be re-evaluated. One of them is the fence height. Depending on the intention of the design, the height of the fence needs to be adjusted to accommodate the idea. The importance is that every fence should have some amount of low portions, allowing and encouraging the interaction between the pedestrians and the dwellers. The other aspect that following on the width decision is the consistency of the width. The width of the fence should also change based on the design opportunity of the particular place.

In order to allow the new fences to perform, in the proposed plan there is an area devoted as the buffer zone. The buffer zone starts from the property line and goes towards the back of the property for three feet. This is the area where the fence can expand, encouraging the non-linearity of the fence and this boundary condition.

The house

Many tasks that formerly required going to the city can now be performed without stepping out the front door. Thanks to advanced information technology, people can stay home and order daily items from their house. They can do their grocery shopping online and the
groceries will be delivered to their homes. Besides shopping, people can take classes at home and also work at home. Many colleges offer television courses where people can stay home, watch the programs and do the homework (if this word still applies). It is more and more common in many industries that employees are no longer required to spend forty hours in the office. They can work on their assignments at home. The office becomes the meeting place instead of a work place. All these changes of lifestyle shifts the role of a house in people’s life. As people spend more time at home, they also spend more time in the neighborhood.

Once people arrive at their house, there are two ways they can maintain contact with the world beyond their property lines. One of these is to physically go out and interact with others. The other option is to go to the television or the computer.

Going outside and keeping in touch with the world-community means not isolating oneself in the car but by walking and interacting directly. The walking interaction provides the missing experience of being in a city and engaged in a community currently simulated by the Internet. This issue of urban living is the central intention of the site design strategies.

Another way of going out is to allow more outdoor living space to occur. During the design process of this project, the existing condition of the neighborhood was examined closely. Some conditions enhance the interaction between neighbors at the residents’ wishes. Most of the houses in the area are composed of one simple box with many attachments, like the decks, porches, exterior stairs, and exterior storage (Figure 27). These extensions of the houses not only enhance the characteristics of each house, they also help create the more experience-rich-spaces within the properties. They are integrated into the house designs in the proposal.

In the design example, different scenarios of interaction between neighbors’ extensions of interior living space are shown (Figure 28, Figure 29, Figure 30). In some cases, the extensions are offset from each other to avoid direct visual connection between the two houses and to maintain a certain amount of privacy. In other cases, the extensions are directly facing each other and residents have a direct visual connection between each other. In this condition, privacy can be
obtained by a simple adjustable curtain or blind on the windows or doors. In many cases, entrances of a house have direct visual connection with a neighbor's entrance. This is to allow more opportunity for interactions during the common going to work/coming home time.

The current layers of yard space are broken up to accommodate the extensions of interior living space into the yard. It used to be that the layers were easily visible. All the accessories fit into the layer in which they belong. In the new design, the space and extensions of space overlap different layers and each other. Therefore, it is difficult to draw a straight line through the property without cutting through one or more areas of space and the extensions of space.

To keep the cost of individual buildings down, the proposed design is generated from a simple box form, very much like the typical house that people see in this neighborhood. However, it is important to take advantage of the individual character of the houses to define the outdoor space. Therefore, each interior space takes its own form and the form is expressed on the exterior (Figure 31).

Figure 28: Outdoor Living Space Relationship between A Street House & A Alley House
Figure 29: Outdoor Space Relationship between Three Alley Houses

Figure 30: Outdoor Space Relationship between Two Street Houses
Figure 31: Top view of the proposed design including two Street Houses and two Alley Houses
CONCLUSION

Urban sprawl has been and continues to be a serious problem in the United States. The awareness of the harmful consequences of uncontrolled growth is gaining more publicity and people are better informed about the issue of urban sprawl. While there are different strategies proposed by different agencies to deal with the problems of urban sprawl, there are also people who believe that suburb development is the future 'natural' direction for America. The books *Edge Cities* and *Bourgeois Utopia* are two examples of that. Regardless of what one thinks about the rapid growth of the suburbs in the United States, whether one embraces sprawl as the new form of city or as unchecked growth, there is still one major problem with the way people live in this environment. The dependency on the automobile is crucial in the suburb environment. Without a car, it is very difficult for people to travel to different places, local or distant. The car has also created the opportunity for people to live further away from downtown, pushing subdivisions further out along the interstates. Besides the automobile, the advancement of information technology allows a more dispersed living environment for people. People can now shop online, work online, research online and even meet people online. Besides providing speed and convenience to the population, there is more that attracts people to the Internet. The vibrant and spontaneous atmosphere the Internet is providing what is missing from the subdivision setting. It is similar to the atmosphere that a traditional dense pedestrian oriented downtown would provide. This thesis reconsiders the role of an existing downtown area, which have the supporting infrastructure and amenities for a rich and varied pedestrian oriented district. Such a district is capable of providing a similar kind of experience that the Internet is providing, to the residents of the neighborhood. While growth and development are a constant given condition, how and where we choose to develop and grow falls to designers, architects, planners and citizens. Designing for an existing downtown area allows it to become a sustaining community. In Ames, the non-conforming lot condition provides us an opportunity to develop a smart growth solution for our community.
NOTES

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