IV. Blue Zoning America: Simple Fixes, Big Results

> It's not impossible to improve well-being in communities. By focusing on making healthier surroundings, we've been able to help people live longer and better in 26 American cities. The key is identifying evidence-based designs and policies that make the healthy choice, the easy choice. Then having a comprehensive plan to implement those nudges in schools, grocery stores, restaurants, workplaces and with municipal governments.
>
> – Dan Buettner, Blue Zones Founder and National Geographic Fellow

As it was very clearly stated in the "American Nightmare," the United States' built environment is very different from these Blue Zones being studied around the globe. Most of the Blue Zones, besides Loma Linda, are organically formed villages that are somewhat isolated from the rest of the world. Dan Buettner's big question became: how can we reverse "engineer" our lives to match some of the elements that bring life to these other places in the world?

There is quite a bit to be learned from these 5 Blue Zone regions, but how do we maintain our current resource rich lives while gaining the 12 quality life years that the Blue Zones have? The Blue Zones seem so vastly different from life in the United States from their natural and built environments, to their isolated culture and self-reliance. The Blue Zones seem to lack diversity, of both biological genes and culture, while the United States is home to a wide variety of people and cultures.

This section of the paper will briefly look into some of these places, large and small, that have been able to make simple policy, urban design, and lifestyle decisions that have drastically changed the quality of life and life expectancy of the residents. The Blue Zone team has started transforming American towns. In all of the Blue Zones cities you will notice a focus on policy, the built environment, social networks, building design, or "your inner self" similar to the determinants of health and well-being factors outlined in the very beginning of the paper.

Figure 28: Completed and upcoming Blue Zones Projects across the United States. Source: https://communities.bluezonesproject.com/

Completed Projects:

Albert Lea, Minnesota

California Beach Cities

- Manhattan Beach
- Hermosa Beach
- Redondo Beach

State of Iowa

Upcoming Projects:

Honolulu & Hilo, Hawaii

Wisconsin

Indiana

Klamath Falls, Oregon

North Karelia, Finland: "The Miracle Up North"

In the 1970s, North Karelia, Finland was the first "big experiment" in public health. The Finland experiment is documented in the Blue Zones Solution by Buettner as the first successful attempt of "Blue Zoning" a region. North Karelia is a small, New Jersey-sized region of boreal forests in the eastern part of Finland. The region is positioned right next to Russia and the people who live there are farmers and lumberjacks. Public health results were coming in from national and international surveys showing that this particular region of Finland had the worst rates of heart disease in the world.

Pekka Puska, who was just 27 at the time, was able to pioneer a strategy that saved the lives of more than 170,000 Finns that were suffering from heart disease through an innovative, bottom-up approach. Before being selected as the five-year pilot's leader, Puska worked for the Department

of Public Health and had a medical degree and a master's in social sciences. Puska recalled that he was not hired because he was good, but rather because he was young and it was going to take decades to solve the problem (Buettner, 2015).

The main culprit in North Karelia was their high-fat diet with seemingly no fruits or vegetables. Local dairy farms made milk and butter common household staples. Before World War II, the residents lived off the land and had a relatively healthy diet. After the war, veterans were given plots of land where they bought a few pigs and dairy cows and set the stage for the world's deadliest diet. Vegetables began to be considered as "food for the animals."

The Seven-County Study performed at the time came to a conclusion that the farther north a man lived, the more dietary fat they tended to consume mostly from meat and dairy. Geoffrey Rose, a British epidemiologist argued that whether you live a short or long healthy life was a function of the population you belong to more than the quality of your doctor or hospital care. Puska and his team took this to heart and worked directly with local health care systems and community organizations to spread the message of healthy eating and nudged people of the region into adopting a low-fat, high vegetable diet at a community and household level. I found it interesting that the team found the best way to spark cultural and behavioral change was from the bottom up, recruiting usually women who were already involved in other civic organizations.

Puska found a local homegrown replacement for dairy products: berries. The team was able to convince local dairy farmers to apportion some of their pasture land to grow berries. During the summers, blueberries, raspberries and lingonberries grew but the berry season was always somewhat short. Puska and his team supported the establishment of businesses that were able to freeze, process, and distribute berries year-round.

At the end of the five years, the results were quite impressive. The proportion of residents consuming high-fat milk dropped from 70 percent to less than 10 percent and 60 percent of households now cook with vegetable oil instead of butter (Buettner, 2015). Vegetable consumption has tripled and overall salt intake has decreased by 20 percent. The rate of heart attack death among middle-aged men was reduced by 25 percent and lung cancer deaths fell by 10 percent due to a dramatic reduction in smoking. Mortality of all cancers dropped by 10 percent. In the past 30 years, the life expectancy of Finnish males increased by ten total years (Buettner, 2015). This "Miracle Up North," as it is often referred as, has not been replicated to this day. Buettner mentions that he needed to absorb all of the key principles of this model in order to manufacture a Blue Zone in America.

The nine lessons learned from North Karelia include:

- Focus on the ecology of health
- Think operating system, not program
- Work with local health systems
- Push, push, push
- Find a charismatic leader
- Community ownership
- Bottom up, top down
- Measure, measure, measure
- Start small, go big

Albert Lea, Minnesota: The First Blue Zones City

Buettner first consulted public health officials at the University of Minnesota about creating American Blue Zones and they told him to measure each campaign in the process to assess how well it was working because people's lives were affected. A community-wide initiative is not cheap and generally costs around $1 million to conduct. AARP rallied behind Blue Zones Project along with UMN School of Public Health. The pilot project began in 2009 (Buettner, 2015).

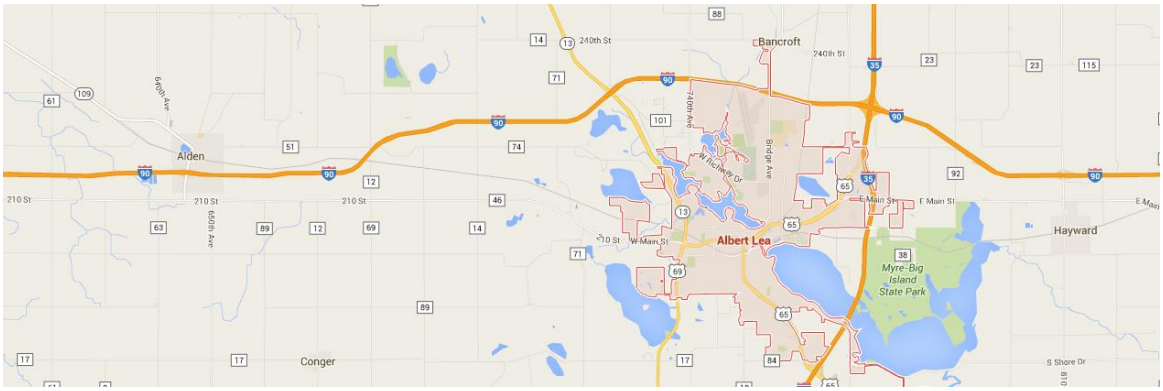

Figure 29: Albert Lea context map. Source: Google Maps

The town of Albert Lea, Minnesota was selected through an RFP process because it represents the "typical" American city; it isn't too big or too small, too healthy or too unhealthy. The 17,931 resident city was small enough to make a difference, but large enough that it could serve as a model for other cities across Minnesota and the United States (Wikipedia). The Blue Zone team decided to focus primarily on a 20 mile "life radius" around the resident's homes and workplaces because that is where most time is spent throughout the day. They analyzed the natural and built environment

surrounding the grocery stores, schools, restaurants, etc. and asked key questions such as is the environment walkable? What type foods are primarily displayed in the grocery stores? Are the parks attractive and inviting? The unique approach to this pilot project was to work on the surroundings instead just of relying on individual responsibility. The experiment was to change the town's whole ecosystem and specifically the social ecosystem.

AARP agreed to partner with the Blue Zones team to provide generous financial support for the first Blue Zones city. National media outlets, such as ABC and USA Today, also had interest in Blue Zones coverage. America was ready to create change.

The residents of Albert Lea were motivated to create change from the beginning. The Blue Zones team started with creating a positive social environment. Research has shown that if your three best friends are obese, there's a 50 percent greater chance that you will be overweight too (Buettner, 2015). The first question that was tackled was: Does the environment promote walking? Walking groups of five to seven people were created that walk and socialize together multiple times a week. These walking groups are similar to Okinawa's *moai*, or support group, while increasing physical activity through moving naturally and having the right tribe and a sense of community support. Another program that was created was the "walking school bus," in which parents and children that normally took the school bus together created a walking school bus instead. This walking group became very popular across town and senior citizens throughout the town actually began volunteering their time to be weekly chaperones of the walking school bus. The walking school bus program engaged the community, increased physical activity amongst school age and adult residents, as well as gave aging residents a continued purpose within the community.

After working on the social environment, the team began to tackle the built environment. The built environment is controlled by budgets and policies. The team began to look at how they could implement change within the everyday buildings across town: supermarkets, schools, etc. In the supermarkets, it was clear to the team that the aisles were set up like any typical American supermarket; healthy foods tucked away out of eyesight, while unhealthy foods displayed at eye level, on aisle ends, central tables and a at final checkout. I began to wonder why is this? Why are junk foods displayed like they are what the American people want most? Why are healthy foods not displayed at eye level? The Blue Zones team created a "Blue Zones Lane" at the supermarket checkout, replacing what was once candy and gum with fruit cups, granola and nuts. Blue Zones foods like beans and sweet potatoes were then called out in the regular aisles with special Blue Zones labels. At school, the team began restocking vending machines with healthier foods instead of the typical soda pop, chips and cookies.

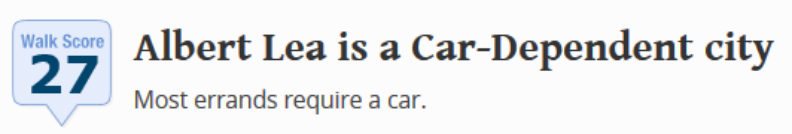

Figure 31: Although it appears to be walkable, the Walk Score shows that it is still a car-dependent town. Source: Walk Score.

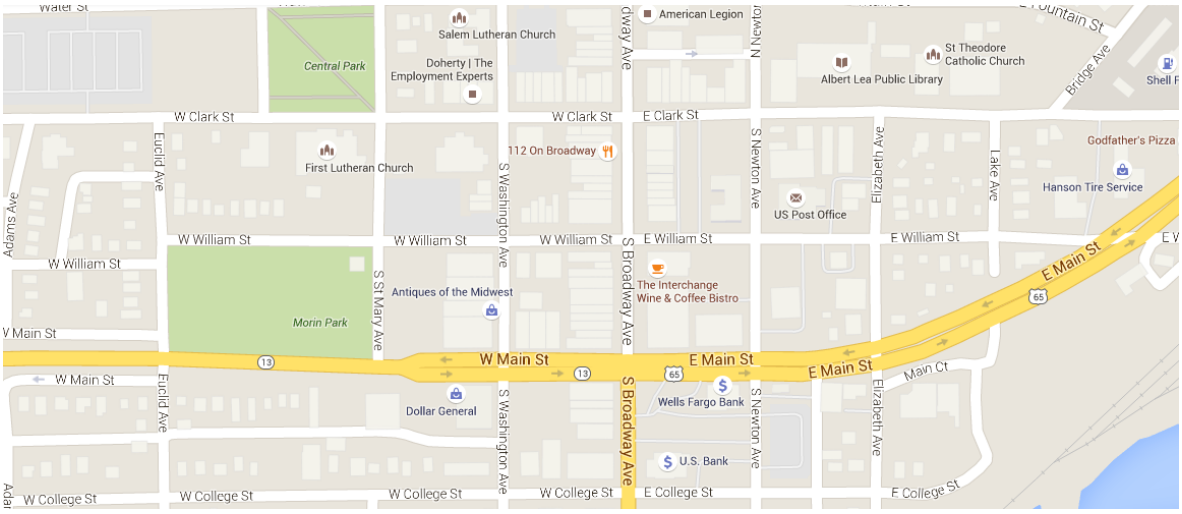

Figure 30: The urban form of Albert Lea is formalist with an urban street grid network Source: Google Maps.

Finally, after the social environment and the built environment, the change made its way to the individuals themselves. There was a kick-off meeting in which about 4,000 people, 25 percent of the community, pledged to get involved with the Blue Zones project on an individual level. Households began to see restocked refrigerators and pantries with healthier foods (Buettner, 2015).

It didn't take long for the city leaders to realize that Main Street is a place not just for cars, but also for humans. Mayors, city managers, chamber of commerce presidents, superintendents of schools, members of local media all became invested in the project along with community residents. What is important to remember is that the Blue Zones Project started out as an experiment similar to the "Miracle Up North." By taking little steps and making small adjustments to eating, physical activity and social circles, the team was able to reverse environments that caused so many of the non-communicable, chronic diseases outlined in the American Nightmare.

Ultimately, the Blue Zones project brought together community organizations, leadership and residents to give back, share and have a purpose. It was truly a public, private and community partnership. The results of the Albert Lea Blue Zone pilot project were stunning with a total of 12,000 pounds shed and decreased healthcare costs by nearly 40 percent (Buettner, 2015). More than half of all employers were acting on pledges to make workplaces healthier environments along with two-

thirds of the locally owned restaurants. All school age children were being reached through at least one of the Blue Zones school programs. At least 800 people had joined a walking moais and more than 80 children went to school as part of the walking school bus. Community gardens increased from 70 to 116. This project, which took only 6-9 months, was very successful and the team learned that Blue Zoning a community is in fact very scalable. The beach cities of California were next on the list, as well as the whole state of Iowa.

California Beach Cities: Manhattan, Hermosa and Redondo Beach

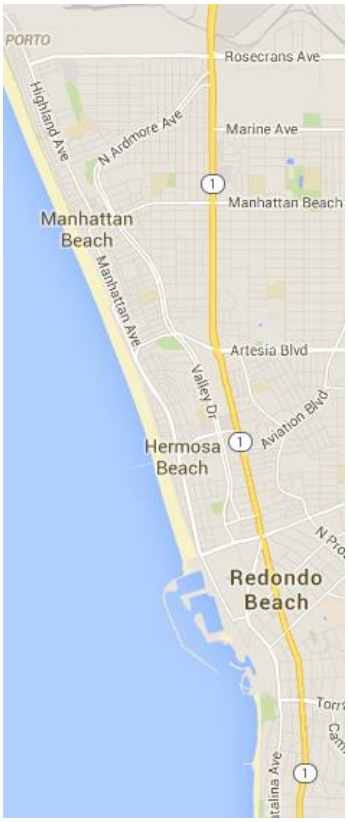

Figure 32: Source: Google Maps

The geography of the beach cities creates a "congested pressure cooker of stress" as Buettner calls it in the Blue Zones Solution. Bordering the beach on one side and the freeways on the other, these towns are situation in prime real estate land in the Los Angeles area. Similar to Loma Linda, these communities were sandwiched right near all of the temptations of consumer America, yet surprisingly Loma Linda's Adventist culture never succumbed to the pressure.

Real estate is religion in the California beach cities. What were once simple cottages and surf shops became pricey houses and brokerage offices. All three beaches a similar in that they share the ocean and Pacific Coast Highway, but have their own identity. Manhattan Beach is ritzy and suited for the 36,000 overachievers that live there. Hermosa Beach is a party town and the smallest of the beach cities with 20,000 residents, which used to be a more eclectic bohemian place. Redondo Beach is the largest beach with 68,000 residents and is the most diverse with a large Hispanic and Asian population.

Although these cities seem to have a great location near ocean with a lot of people getting physical activity, Buettner notes that this was surprisingly not the case. For every one person out running and biking, there were a couple more sitting inside eating junk food and watching television. Even though the residents lived in an "ideal" location, they were not immune to the pressures, temptations and bad habits affecting the rest of the American population.

From 2010-2013 the Blue Zones team tackled the beach cities, using what they had learned from Albert Lea, and scaling it up to work for the beach cities in California.

The results of the transformation in the beach cities was once again very promising. The Redondo Beach City Council tripled the total length of biking infrastructure in the community from 14 to 38 miles. More than 40 restaurants created healthy menus for customers. Three-thousand students began walking to school every morning instead of taking a car. Finally, 1,600 residents formed 150 group moais that walked, shared potluck meals and attended purpose workshops together. After two years, the cities secured an additional $3.8 million in state/federal funding for future planning initiatives.

State of Iowa

Iowa Governor, Terry Branstad, launched the statewide Blue Zones initiative in 2011. Iowa was on a mission to become the healthiest state in the United States. The state of Iowa signed up to become a Blue Zones demonstration site, with 20 towns rising up to the challenge to create a healthy environment for its residents. Towns such as Waterloo, Cedar Falls, Mason City, and Spencer are just a few that have made the pledge.

Figure 33: Spencer, Iowa context map. Source: Google Maps

Spencer

Spencer, Iowa located in the northwestern region of the state is only 11 square miles in area and is home to about 11,233 residents (Wikipedia). It was Iowa's first state certified Blue Zone community and has been leading the way for the rest of the Iowa Blue Zone communities. The town's small size at times was challenging to deal with. The town didn't have certain leadership and workforce positions that Albert Lea and the beach cities had to help implement the project. The small size made it even more important to build close community relationships and because of this

closeness, the Blue Zones word spread fast. Within only one year, half of Spencer's residents were participating in the project in some way. In 2013, national names such as Wellmark Blue Cross and Blue Shield, Healthways and the Blue Zones named the town the first certified Blue Zones Community.

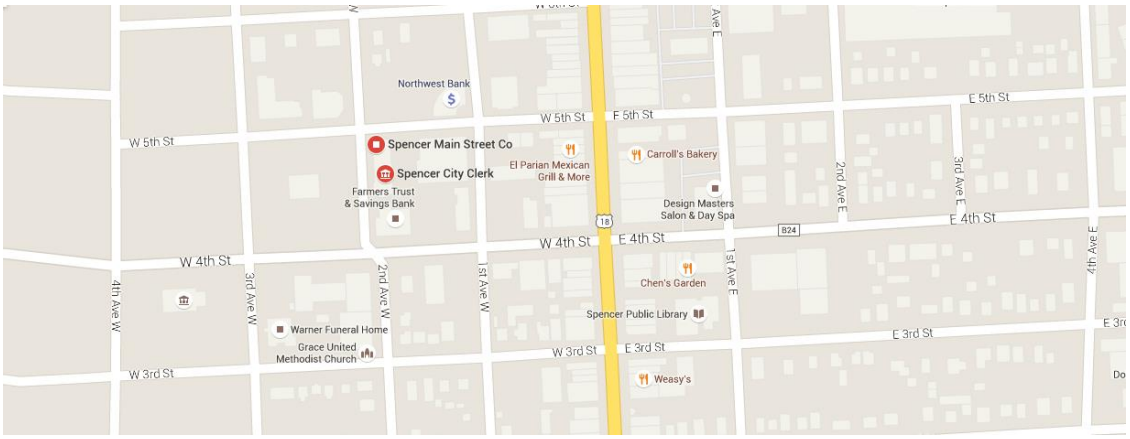

Figure 34: Spencer's formalist urban form. Source: Google Maps

From a planning perspective, it is really exciting to see what can be done at a small scale to create big changes. The city planners of Spencer were able to block off one of the entrances to a convenience store between the Junior High and High School that was typically a stopping ground for students. Blocking the entrance made what was once a convenience in route much more inconvenient.

Community gardens have sprung up across the town increasing from one location to three with 36 total plots. These community gardens allow residents access to local fresh fruits and vegetables. Community gardens are great assets to the community for creating an ecology of health that encourage the 5 habits and practices of the Power 9 most linked to the environment: move naturally, plant slant, right tribe, community, and loved ones first.

Similar to all the other Blue Zones Communities, Spencer formed walking moais that spread happiness and healthy behaviors throughout the social environment.

Cedar Falls

Cedar Falls, Iowa is located in the northeast region of the state and is 29 sq. miles with a population of 39,260 residents (Wikipedia). Unlike Spencer, Cedar Falls is a college town for the University of Northern Iowa and is home to many students. Policymakers, business-owners, residents, university staff and students all embraced the core principles of the Blue Zones and rallied behind the project. Hy-Vee, the main grocery store partnered with Blue Zones to make the healthy

options the easier options. Similar to Albert Lea, they created Blue Zones checkout lanes stocked with healthy snack food. The university's cafeteria decreased the diameter of their cafeteria plates and eliminated the trays completely to encourage students to not overindulge and to stop when their stomachs felt 80 percent full, similar to the Okinawans.

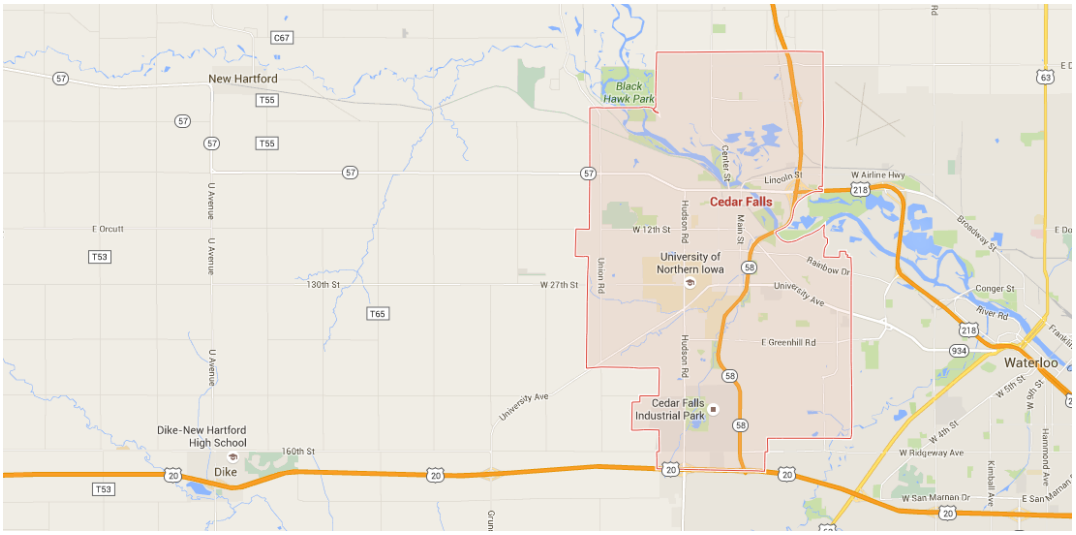

Figure 35: Cedar Falls, Iowa context map. Source: Google Maps

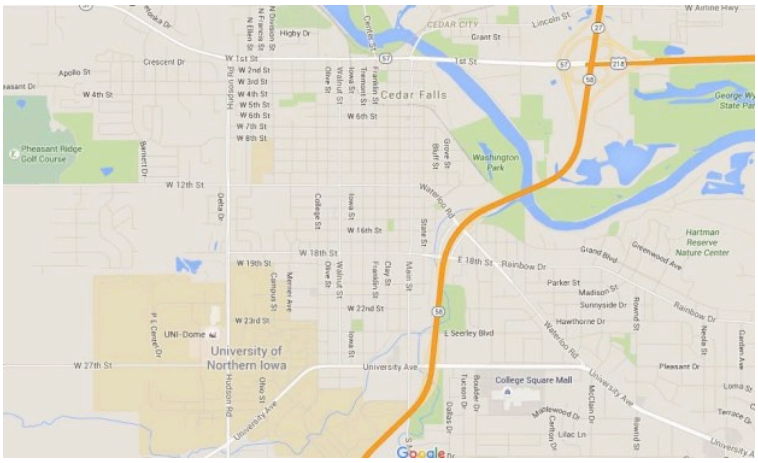

Figure 36: Cedar Falls' formalist and modernist urban form.

University of Northern Iowa added a campus garden that created a public space for students to cultivate social networks as well as healthy fruits and vegetables. The local elementary schools also established a school garden program that educated young children on healthy eating as well as a healthy relationship with the environment. From a planning perspective, it is exciting to hear that in 2013, the National Complete Streets Coalition named Cedar Falls as one of the 15 best Complete Streets policies in the nation.

V. Policies and Programs Impacting the Ecology of Health

Socio-ecological models and determinants of health could be further studied in order to understand how implementation should happen on multiple scales. Socio-ecological models of health behavior studied in the fields of public health, psychology, sociology, environmental planning, etc. provide a good framework for how we should go about planning in the future. They emphasize the environmental and policy contexts of behavior, while incorporating social and psychological influences. Ecological models lead to the explicit consideration of multiple levels of influence, guiding the development of more comprehensive interventions (Sallis, 2008). As was shown in the Blue Zones research, interventions should happen on multiple levels in order to make the strongest impact.

The core concept of an ecological model is that behavior has multiple levels of influences, often including intrapersonal (biological, psychological), interpersonal (social, cultural), organizational, community, physical environmental, and policy. Ecological models are believed to provide comprehensive frameworks for understanding the multiple and interacting determinants of health behaviors. Ecological models can also be used to develop comprehensive intervention approaches that systematically target mechanisms of change at each level of influence. Four core principles of ecological models of health behavior are proposed (Sallis, 2008):

1. There are multiple influences on specific health behaviors, including factors at the intrapersonal, interpersonal, organizational, community, and public policy levels.
2. Influences on behaviors interact across these different levels.
3. Ecological models should be behavior-specific, identifying the most relevant potential influences at each level.
4. Multi-level interventions should be most effective in changing behavior.

The focus of the paper has primarily been on the efforts of the Blue Zones team and the projects that they have implemented in the United State as a result of Dan Buettner's research. It is worth noting policy decisions in Atlanta and across the United States that are not connected to the Blue Zones research that still address the built environment and health in exciting and innovative ways. The 5 habits and practices that I have identified out of the "Power 9" that are most influenced by our environment are: move naturally, plant slant, right tribe, community and loved ones first. The

reality today is that most of the public has not even heard of Blue Zones, yet they understand the consequences of poor planning and design on health. If we are able to understand how somewhat typical policies and programs in the United States relate to these Blue Zone's habits and practices, we are on our way to understanding what needs to be changed with or without the initiative of the Blue Zones projects.

Move Naturally – Walkable Urban Development

In 2010, 28.7 percent of metro Atlantans were obese and ranked the 11th highest for pedestrian fatalities (Dunham-Jones, 2011). Atlantans also have a higher than MSA average rate of motor vehicle crash deaths. There is no doubt that Atlantans need a more pedestrian friendly environment to encourage physical activity, combat obesity, and decrease VMT.

Christopher Leinberger and Mason Alexander's The WalkUP Wake-Up Call: Atlanta discusses the growing demand of walkable urban development since the 1990s in Atlanta, the "poster child of sprawl." The growth in demand has mushroomed as a portion of real estate in the 1990s to now a majority of the real estate cycle (Leinberger, 2013). Buettner's concept of move naturally is taken to heart in walkable urban development by using walkability performance metrics to measure and increase walkability in neighborhoods across the United States.

The importance of understanding how walkable urbanism works and what policies and real estate strategies will be needed in the future to meet the growing demands. I also think it is important to note that drivable suburban development is a form that can be found in the city and walkable urban development can be found in the suburbs (location seems to not be as correlated as we thought). WalkUPs are regionally significant walkable urban places in Atlanta and can be a downtown, downtown adjacent, urban commercial, urban university, suburban town center, driveable suburban commercial redevelopment or greenfield/brownfield. A WalkUP can be ranked on their economic and social equity performance copper, silver, gold or platinum. There is a lot of potential for Atlanta with potential and emerging WalkUPs to add to the already good supply of established WalkUPs. Walkable urban places are a great form of development that is addressing "move naturally."

Plant Slant - Urban Agriculture

Studies have shown that urban agriculture contributes to healthy communities by engaging individuals in work and recreation that improves both individual and public well-being (Bellows,

2003). One health outcome measurement that could be analyzed further is how the physical activity of working on urban farms affects the overall health of gardeners. While the wellness aspect is often discussed, gardening is a physical activity that ranges from working fine motor skills to heavy aerobic exercise (Brown, 2000). Additionally, some of the stress relief gardening is responsible for can result in better physical health such as lower blood pressure and muscle tension (Brown, 2000). Obesity and associated health risks are linked with low physical activity (Lopez and Hynes, 2006). Incorporating agriculture into a city would be an outlet for physical activity. The Center for Disease Control has laid out steps to measure the effects of physical activity. Researchers could first document frequency of physical activity before working on a farm and note the baseline percentages of employees of the farm with physical health conditions. They could then periodically reassess frequency of activity from farming and monitoring how physical health changes over time to determine the physical benefits of urban agriculture (Center for Disease Control, 2014). While the benefits of eating more produce from urban agriculture is heavily studied, the physical impacts on the farmers themselves is less studied and could highlight additional benefits of urban agriculture or "plant slant."

In addition to physical activity, urban agriculture may have a significant impact on access to healthy foods. Researchers could measure access to healthy food based on the USDA's definition of a food desert. According to the USDA, a food desert is an area in which at least 33 percent of the census tract's population resides more than one mile from a supermarket or large grocery store (USDA, 2013). In many low-income communities, the only places to buy food are fast-food and convenience stores that sell fatty, sugary, processed foods. This lack of access to healthy foods makes it difficult for families to eat nutritiously. Studies have consistently shown that fewer supermarkets and other retail outlets selling affordable, nutritious foods are located in low-income communities than in wealthier ones, and in predominantly African American and Latino neighborhoods than in predominantly white neighborhoods (Walker 2010). Community environments affect people's eating and exercise habits. Scientists and medical professionals agree that lack of easy access to healthy foods and safe outdoor areas for physical activity are key contributors to obesity (USDHHS, 2001).

Right Tribe and Community

Surrounding yourself with close friends, family and coworkers that support healthy behaviors is key to long life and well as having some sort of faith-based routine or service to attend. The Vita Health and Wellness District located in Stamford, Connecticut serves as an interesting case

study for a transformative, healthy town that follows the determinants of health. Similar to the Blue Zones, they were able to redevelop and rezone Main Street as well as provide new public housing mixed with market housing and expand their hospital.

Besides making changes at a community level, changes can be made on a smaller social network level within church groups or work environments. It would be interesting to research what programs can be put in place in work offices to encourage healthy lifestyle choices.

Loved Ones First – Accessory Dwelling Units and Granny Pods

"Happy, healthy centenarians in the Blue Zones areas put their families first. This can take shape in many ways, from keeping your aging parents and grandparents in or near your home to being in a positive, committed relationship, which can add up to 6 years of life expectancy (Blue Zones Project, 2016)." Whenever I read about "loved ones first," I would instantly think of zoning regulations that prohibit accessory dwelling units and neighborhoods. These accessory dwelling units have the potential to serve as "granny pods," keeping aging parents and grandparents near their families and grandchildren.

The MEDCottage — "is a prefabricated 12-by-24-foot bedroom-bathroom-kitchenette unit that can be set up as a free-standing structure in their backyard. It's more than a miniature house — it's decked out with high-tech monitoring and safety features that rival those of many nursing homes (Seliger, 2012)." Typical zoning regulations can create barriers for placing these units on property. State laws can sometimes be passed that permit temporary medical dwellings on resident's property as long as a physician verifies that the patient needs assistance with daily functions (Seliger, 2012). It would be great to see accessory dwelling units permitted not only when elderly individuals are sick, but when they are healthy as well so that they can enjoy spending time with their loved ones.

VI. Next Steps

Conclusion and Recommendations

There is no denying that the United States is dealing with a public health crisis primarily due how we design our built environment and our lifestyle decisions. The Blue Zones message might be new to our ears, but its underlying principles have been understood to be important now for generations. The poor health outcomes have been reiterated over and over again and it is time to take action.

The key behind the longevity in the Blue Zones is that their environments make healthy lifestyle choices effortless. In this paper I have identified five habits out of Buettner's "Power 9" that are most important to focus on when planning healthy community design: move naturally, plant slant, right tribe, community and loved ones first.

Due to the United States resource rich, consumer culture, an individual is often tempted by unhealthy lifestyle choices more than the typical Blue Zone resident ever is, so at first it was hard to compare the two. Typically, the traditional answer to health behavior change is always directed towards an individual's responsibility for their health, which often requires long-term discipline and routine. Research shows that humans, especially Americans, have a hard time with self-discipline when they are constantly tempted by their built environment to make bad decisions. Most people stick with diets for less than 7 months, but if the built environment were to be strategically designed to encourage healthy eating habits, there would be less of a need for extreme caloric restrictions (Buettner, 2015).

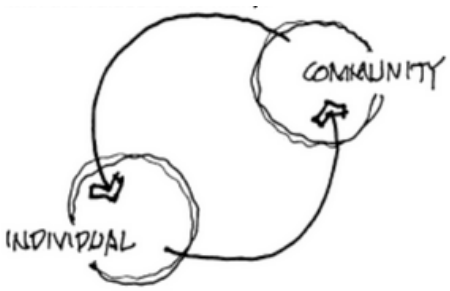

Figure 37: Community and the individual components of the interactivity theory (Dobbins, 2009)

The most successful health projects researched have made changes to the built environment. Instead of focusing on the individual, it is more important to think bigger and more collectively at the whole community and the design of the built environment that nudges these lifestyle choices each and every day. From a planning perspective, it is important to consider the depth of which health and environment policies can impact work, schools, restaurants, grocery store, and home; typical places that most people spend the majority of their time.

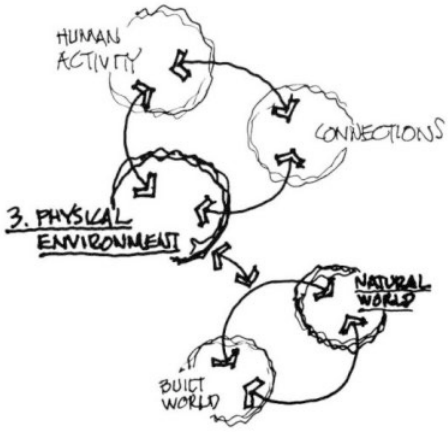

Figure 40: The physical environment (Dobbins, 2009).

Similar to the differences between health and healthcare mentioned in the beginning of the paper, it is so important to act proactively instead of reactively when dealing with healthy community design and health behavior. The next generation of urban designers, planners and public health advocates need to work collaboratively and innovatively to combat the current American system.

More and more governments around the world are listening and responding with policies that put well-being first. Countries with strong social and institutional capital not only support greater well-being, but are more resilient to social and economic crises. A key national challenge is to ensure that policies are designed and delivered in ways that enrich the social fabric for current and future generations. Under the pressures of putting right what is obviously wrong, there is often too little attention paid to building the vital social fabric.

People are more likely to make healthier choices when it's easier to do so. Lasting health is the result of our surroundings rather than our conscious choices. Simple fixes to urban design and the built environment. There is a hidden power behind simple, low-tech and low-cost interventions and they can make a big difference in someone's life.

Research Limitations and Questions

There were multiple research limitations that arose from this study. The health data was very difficult to find and I had to rely on the information that Buettner provided primarily. Buettner mentions that their team had limitations in some of these countries accessing the birth/death certificates was difficult and in many places, the oldest individuals don't know their ages or might be lying about them. Also, the Global Burden of Disease study only had health information by country

and I was not able to find health data about the specific Blue Zones regions due to their isolated and small populations.

A question I had about the Blue Zones research is whether picking the few outliers of longevity and studying them may not be the best strategy. We should expect variations from the expected mean in any subgroup. Can some of these variations in life expectancy be explained only by chance?

Most of the research questions in this paper were addressed, but there were some research findings that were not anticipated to begin with. Throughout the research, trends about the urban form became very clear. All of the Blue Zones studied follow the organic urban form due to the naturally hilly topography and limited technology available to build. The cities in America that were chosen as Blue Zones projects all had an underlying grid framework to work off of. In my opinion, this made their work much easier. In Brenda Case Scheer's *The Anatomy of Sprawl*, she came to the conclusion that American sprawl is composed of three suburban tissues (elastic, inelastic and campus) and some forms are easier to work with than others (Scheer, 2001). In the case of the Blue Zones projects, they started with areas that already had good bones to begin with. It would be interesting to research how these Blue Zones techniques, especially the 5 found to be most related to the environment, could be applied to more dendritic, unconnected suburban forms such as golf course communities. It is easy to work with communities that already have the framework once simple fixes are made and social groups are formed, but it seems quite harder to work with an area that has no connection. The Blue Zones organic form works for them, but does not work for America primarily because of lifestyle, technology and societal differences.

The Blue Zones have been isolated physically and socially for hundreds of years. Buettner mentions that 80 percent of our longevity is due to lifestyle choices, while 20 percent is due to our genetic makeup (Buettner, 2015). It isn't unreasonable to wonder whether these communities have actually been inbreeding for hundreds or even thousands of years. Is it possible that these communities have avoided some of the recessive genetic diseases due to their physical isolation? Are "longevity" genes more prevalent in an isolated gene pool? It would be interesting to research genetic diversity in static and elastic environments. When environmental changes take place, are these communities with genetic sameness in greater danger of dying off?

Finally the last question that I had was whether diversity is in fact not as important to longevity as we thought. The Blue Zones identified seem to lack diversity, yet in the American Nightmare, I outlined how suburban sprawl causes homogenous societies, which can cause feelings

of isolation and depression. This is not the case in the Blue Zones, so it would be interesting to research diversity and self-reported subjective well-being outcomes further.

Further Research

- Examining the remaining variables in Buettner's "Power 9" that were not selected and how planning policies impact them.
- Adding new variables to the conceptual framework.
- How these Blue Zones techniques, especially the 5 found to be most related to the environment, could be applied to more dendritic, unconnected suburban forms such as golf course neighborhoods, strip malls, etc.
- Genetic diversity in static and elastic environments
- Diversity and self-reported subjective well-being outcomes
- Topics of re-greening suburbia for urban agriculture (plant slant) and better uses
- In Ellen Dunham-Jones and June Williamson's *Retrofitting Suburbia*, they note great potential in retrofitting the American suburbs through 1st, 2nd and 3rd generation retrofits. The 1st generation has been primarily completed by the private sector, the 2nd by the public sector and finally the 3rd by public-private partnerships (Dunham-Jones, 2011). What will 4th generation retrofits of American suburbia look like? Will non-profits have a bigger role? Rising millennial planners have exciting work in their futures.
- Policies to dis-incentivize sprawl and how they impact health
- Public, private and non-profit partnerships
- Research the socio-ecological models of health behavior and the determinants of health
- Further literature review of World Happiness Report, Healthy People 2020, etc.

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