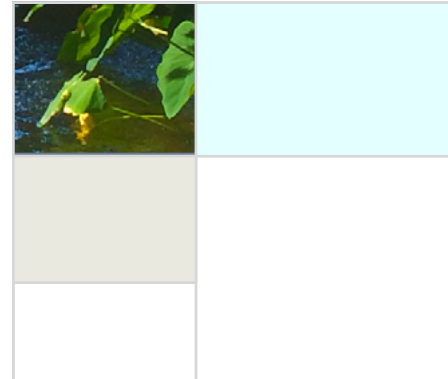# Enhancing Human Health and Wellness through Neighborhood Development Standards

Dominic Ruiz | Master's Report | 2015

ENHANCING HUMAN HEALTH AND WELLNESS THROUGH
NEIGHBORHOOD DEVELOPMENT STANDARDS

by

DOMINIC RUIZ

A REPORT

submitted in partial fulfillment of the requirements for the degree

MASTER OF REGIONAL AND COMMUNITY PLANNING

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KANSAS STATE UNIVERSITY
Manhattan, Kansas

2015

Approved by:

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ABSTRACT

Formally debuted in 2014, WELL Building Standard v1.0 is the world's first building standard focusing solely on health and wellness. The WELL Building Standard is a performance-based standard that is designed to improve human health outcomes by integrating medical research into the design and construction of buildings. However, given the relatively young age of the building standard, it does not yet address health at the community level.

Focusing on the wellness concepts established in WELL Standard v1.0, this research project reimagines the standard as a metric to measure the health and wellness of master-planned communities.

Through an analysis of the WELL Building Standard and other health-related literature, this research project identifies design strategies, protocols, and policies that can be used to improve health outcomes at the community level.

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ACKNOWLEDGEMENTS

INTRODUCTION

INTRODUCTION

Over the past couple decades, green building standards have gone from being a groundbreaking concept to becoming common practice in the building industry. This shift has not only resulted in better building practice, but has ensured a more sustainable environment for the future. Looking forward, it is projected that 40-48 percent of new non-residential construction will be green by 2015, compared to just 2 percent in 2005.[1] The green construction industry also represents a market size that has been valued at more than $120 billion.[2] Nonetheless, today's green building standards do not effectively address the many health consequences that come as a result of our modern lifestyles. These consequences had been overlooked throughout the emergence of building standards, which indicated a void in the building industry and a need for a standard that could address health outcomes.

In October 2014, The International WELL Building Institute (IWBI) filled this void by introducing WELL Building Standard v1.0—a protocol designed to address human health outcomes by integrating health concepts into the design, construction, and operation of buildings to improve the health and well-being of its occupants. WELL Building Standard v1.0 was founded by the WELL Building Institute and real estate firm Delos Living, in partnership with scientists, physicians, architects, engineers, and designers.[3]

With the combined expertise of professionals from the Mayo Clinic and Cleveland Clinic to the Clinton Global Health Initiative, the WELL Building Standard presents a unique approach to the design, construction, and operation of buildings, while complimenting other green buildings standards through the U.S. Green Building Council. With the WELL Building Standard expanding to fit new project types, it is anticipated that WELL will eventually encompass the design, construction, and operation of communities. However, given the relatively young age of WELL Building Standard v1.0, it has not yet been developed to address health at the community level. Therefore, the research question answered was:

Could an expansion of the WELL Building Standard be developed for community planning by using and building upon its existing health concepts and features?

This question was addressed by examining literature of the WELL Building Standard's health concepts, procedures, and assessment tools, as well as those of other green building standards and health-related studies, to identify concepts that can be translated and applied in the context of a community. The results of the research is a Well Communities conceptual standard for community planning and design.
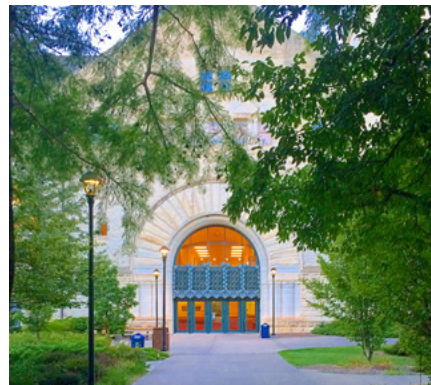
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BACKGROUND

After centuries of rapid urbanization, the phenomenon has changed the way that we live and the communities that we live in. As a result of overwhelming population growth in some cities, many communities have taken on a more urban and compact identity. In 1800, for example, the "urban population" only made up 3 percent of total global population.[1] This cohort has since grown to account for 54 percent of total global population with the United Nations projecting that it will account for 66 percent by 2050.[2] Although this growth has been forecasted for some time, early discoveries of environmental issues connected to global urbanization caused widespread concern and awareness.

ENVIRONMENTAL AWARENESS

The spread of environmental awareness in the developed world influenced a worldwide sustainability movement that gained momentum around the time of the new millennium and is continuing to grow today. One of the world's first green building rating systems, The Building Research Establishment's Environmental Assessment Method (BREEAM), was established in the United Kingdom to mitigate the human impact on the natural environment and its resources through sustainable design. Published in 1990, BREEAM was an early pioneer of green building practice and set the stage for many of the environmental-focused standards we administer today. [3]

Before "green" and "sustainable" became major buzz words in the building industry, standards were historically established as a reactive measure, rather than a proactive one. For example: ASHRAE Standard 90.1, the first American standard to set requirements for energy efficiency in buildings[4], was developed as a response to the oil and energy crisis of the early 1970s.[5] These types of crisis along with other environment threats have kept sustainability at the forefront of the building industry and have made building standards increasingly prevalent to ensure energy efficiency. Today, however, we are in the midst of another movement that is not being influenced by environmental awareness, but rather the increasing awareness of human health.

HEALTH AWARENESS

Due to years of research and warnings by health officials, people are being prompted to reassess their lifestyles and take action to be healthier. This relatively new phenomenon is causing a significant shift in personal behavior and is also being represented in new government policies.[6] According to Susie Ellis, CEO of the Global Spa and Wellness Summit, "we are at a pivotal movement where people worldwide are taking steps to change the way they live, work, and play, while at the same time governments are finally recognizing the value of investing prevention to lower healthcare costs"[7]. Private organizations, such as the U.S. Green Building Council and the International Well Building Institute have recognized this movement as well with the introduction of WELL Standard v1.0 in 2014.

This widespread awareness has developed into what is now considered one of the fastest growing market sectors in the world. In fact, the global "wellness" market is now three times larger than the pharmaceutical industry, valued at $3.4 trillion[8]. This value represents significant growth since 2010 in health eating, nutrition, and weight loss (109 percent increase); preventative and personalized health (78 percent increase), complementary and alternative medicine (65 percent increase), and beauty and anti-aging (51 percent increase).[9]

RELEVANCE

Health awareness is also contributing to the shift that has been occurring in housing preference, as a study conducted by the Urban Land Institute (ULI) in 2013 found that more than half of people in America now prefer to live in smaller homes, more walkable communities, and near public transportation.[10] Considering that this might be the first time that a housing shift this significant has happened in America since the enactment of first Federal-Highway Act over 70 years ago, we as designers will be challenged to think differently. As people continue to live healthier lifestyles, they will continue to demand homes, communities, and environments that can sustain them. These shifts will further encourage architects, planners, and engineers to also be more health conscious as they plan and design the communities of the future. These monumental shifts in lifestyle choices serve as the rationale for my research, as I hope to develop a framework that can be used by communities to holistically address health and wellness.

The literature that was reviewed consisted primarily of the institutional building standard documents and marketing materials, in addition to respective press releases, academic journal articles, and case studies.

BUILDING STANDARDS

According to the International Standards Organization (ISO), a standard is defined as: "A document that provides requirements, specifications, guidelines or characteristics that can be used consistently to ensure that materials, products, processes, and services are fit for their purpose".[11] In the realm of building standards, they are typically administered by government entities, municipalities, and private not-for-profit organizations to ensure safety, quality and efficiency in the construction and operation of buildings. Generally, building standards are intended to be applied by architects and engineers. However, they are also used by professionals in the fields of environmental science, real estate development, and manufacturing for various purposes—standards are often used by these professionals to achieve improved performance and energy efficiency.

Although many of the building standards that exist today share similar fundamental principles, each standard is structured uniquely, covering a broad spectrum of typologies, methodologies, guidelines, rating systems, and requirements. Components of building standards may be either prescriptive or performance-based.[12] ASHRAE, for example, contains prescriptive requirements for indoor environments by setting specifications and requirements that can be applied to indoor environments, whereas the WELL Building Standard sets performance-based requirements for indoor environments.[13] Prescriptive standards are typically less flexible than performance-based standards, as they outline exact specifications that are expected and are sometimes even adopted into law by jurisdictions.[14] Performance-based standards define and outline expected results and allow for flexibility in the methods used to achieve those.[15] Both types of standards are used frequently, though, with prescriptive, there is little incentive to do

anything beyond compliance, which is a performance-based standards like WELL and LEED are growing in presence.

Standards can also be mandatory or voluntary depending on their purpose and what type of organization administers them.[16] For example, parts of standards like ASHRAE and the International Green Construction Code (IgCC), can be adopted by jurisdictions and thus be required by law. These types of standards are likely to be applied to materials and resource use, indoor environmental air quality emissions, indoor safety, and public health. Voluntary building standards such as Green Globes, LEED, and the Living Building Challenge are often used as an incentive for reducing energy costs.[17] In fact, a study of LEED certified buildings by the USGBC found that LEED construction can result in savings of over 20 percent, while operating costs can also be reduced by over 10 percent.[18]

The process in which a standard is developed can also vary with consensus-based standards being developed through a formal and extensive consensus process, while non-consensus standards are usually proprietary and developed by a private organization outside of the formal process.[19] The International Green Construction Code (IgCC) is an example of a consensus-based standard, as it is described as being "adaptable, enforceable, and consensus-based", meaning that it offers flexibility for municipalities that adopt it and is developed and voted on by a committee with input from over one-hundred professionals.[20] The IgCC code, like many others, is aimed at making buildings more efficient, reducing waste, and positively impacting health, safety, and community welfare.

GREEN BUILDING STANDARDS

From construction to completion and occupancy, buildings require a significant amount of natural resources and emit atmospheric emissions that are potentially harmful to our environment and personal health.[21] Due to this knowledge, there is now a proliferation of "green" building standards, certification programs, and rating systems in the marketplace

that are designed to mitigate the impact that buildings have on the natural environment.

Green construction differs from standard construction due to their focus on environmental responsibility, which is standard construction does not typically address. The U.S. Environmental Protection Agency defines "Green Building" as the "practice of creating structures and using processes that are environmentally responsible and resource-efficient throughout a buildings life-cycle from siting to design, construction, operation, maintenance, renovation, and deconstruction".[22] The focus on the environment is now integrated into the concept of building standards.

TYPES OF GREEN STANDARDS

Green model standards and rating systems, as identified by The United States Environmental Protection Agency and shown in Table 2.1 include the International Green Construction Code (IgCC), ASHRAE 189.1, National Green Building Standard (ICC 700), Green Globes, Leadership in Energy and Environmental Design (LEED), and the Living Building Challenge.

Green Neighborhood Standards

With many of the world's real estate markets thriving, many large-scale development projects are making their way back into the pipeline. However, as competition and real estate values in some of these markets reach an all-time high, developers are actively looking for tools that assess their triple bottom line in communities. Increased interest in sustainability at the neighborhood level has prompted a number of organizations and communities to develop green voluntary assessment tools specific to neighborhoods.

Green neighborhood standards take the same basic principles of green building and apply them in a way that lays out environmental strategies and sustainability at the scale of neighborhood communities. These types of standards can be an effective tool for municipalities to encourage the development of green communities or for developers to build them

Neighborhood standards address concepts such as neighborhood pattern and design, urban infill, and brownfield developments.

Table 2.1: Comparison of Green Building Standards

Standard	Standard Type	Mandatory / Voluntary	Building Type	Project Type
International Code Council's *2012 International Green Construction Code* **(IgCC)**	Model Code	Mandatory	**Commercial**: all **Industrial**: all but manufacturing systems and equipment **Mixed use:** all **Residential:** multi-family with more than 3 stories	New construction Additions Alterations
ANSI/ASHRAE/USGBC/IES Standard 189.1-2011:*Standard for the Design of High-Performance Green Buildings Except Low-Rise Residential Buildings* **(ASHRAE 189.1)**	Model Code	Mandatory	**Commercial**: all **Industrial:** all **Mixed use:** all **Residential:** multi-family with more than 3 stories	New construction Additions
ICC 700-2012: *2012 National Green Building Standard* **(ICC 700)**	Rating and certification system	Voluntary	**Mixed use:** residential space **Residential:** all except institutional uses	New construction Additions Alterations
Green Globes™	Rating and certification system	Voluntary	**Commercial:** all **Mixed use:** all **Residential:** multi-family	New construction Additions Alterations Existing buildings
US Green Building Council's *Leadership in Energy and Environmental Design* **(LEED®)**	Rating and certification sstem	Voluntary	**Commercial:** all **Industrial:** all **Mixed use:** all **Residential:** all	New construction Existing buildings Additions
The International Living Future Institute's *Living Building Challenge* **™, version 2.1 (May 2012)**	Rating and certification system	Voluntary	**Commercial:** all **Industrial:** all **Mixed use:** all **Residential:** all	ALL

(Source: U.S. Environmental Protection Agency, 2014)

I identified LEED for Neighborhood Development (LEED-ND) and BREEAM Communities as being most appropriate for comparison because they are the most comprehensive international green standards for neighborhoods and also the most used.

Leadership in Energy and Environmental Design (LEED)

Introduced in 2007, the LEED Standard for Neighborhood Development (LEED-ND) is a voluntary set of criteria that can be measured to determine how sustainable a neighborhood or community is. LEED-ND can apply to entire neighborhoods or parts of neighborhoods, as the typology recognizes a development as a neighborhood if it contains two buildings or more.[24] LEED-ND address factors such as a project's location, design, and use of green technology in its rating scale.[25] As a ready-made set of environmental standards for land development, it can be a useful tool for all stakeholders of a community, whether that be a developer, city official, or citizen.

Similar to the structure of the WELL Standard, LEED-ND establishes a set of prerequisites that serve as a baseline with additional components that can be added to achieve a higher level of certification. The LEED Green Building Rating System for the neighborhood-development project type assesses five different categories including: smart location and linkage, neighborhood pattern and design, green infrastructure and buildings, innovation and design process, and regional priority credit (U.S. Green Building Council, 2014). As shown in Table 2.2, the categories include a list of prerequisites, as well as weighted credits. For example, the credit for local food production is not weighted as heavily as the credit for providing mixed-income diverse communities.

Similar to most other voluntary green building standards, LEED-ND uses a rating scale to assess the sustainability of a project. The number of points that a projects accrues out of 100 possible points determines the level of LEED certification that the project is eligible for.[26] There are also four levels of certification including: standard, silver, gold, and platinum, which require 40-49 points, 50-59 points, 60-79 points, and 80-plus points, respectively.

TABLE 2.2: LEED NEIGHBORHOOD DEVELOPMENT

SMART LOCATION & LINKAGE	#
Prereq Requirements	5
Credits	9
Points Possible for Credits	27
NEIGHBORHOOD PATTERN & DESIGN	
Prereq Requirements	3
Credits	15
Points Possible for Credits	44
GREEN INFRASTRUCTURE & BUILDINGS	
Prereq Requirements	4
Credits	17
Points Possible for Credits	29
INNOVATION & DESIGN PROCESS	
Prereq Requirements	0
Credits	2
Points Possible for Credits	6
REGIONAL PRIORITY	
Prereq Requirements	0
Credits	1
Points Possible for Credits	4
Total Points Possible	110
Minimum points needed to be certified	40-49
Points needed for Silver	50-59
Points needed for Gold	60-79
Points needed for Platinum	80+

(Source: U.S. Green Building Council, 2009)

BREEAM Communities

Similar to LEED, the BREEAM for Communities standard serves as a voluntary international assessment tool for improving and measuring various aspects of sustainability in large-scale development projects. Contrary to LEED, the standard places emphasis on the master-planning process of communities by setting forth a framework that encourages collaboration between planners, developers, occupants, and neighbors.[27]

The BREEAM Communities framework addresses the entire "triple bottom line" (environment, social, and economic factors) to ensure cohesive sustainable developments, making it a very powerful tool for assessing a project's cohesiveness within existing communities.[28] BREEAM for communities can be applied to mixed-use or single-use projects and uses objective criteria in recognizing the environmental performance of them.[29] The criteria that is applied includes: (1) Issues for assessment are agreed to be significant; (2) Project offers worthwhile reductions on environmental and sustainability impacts; (3) Issues must be assessable at the relevant stage in the project's life; (4) Performance levels are based on scientific evidence wherever possible; (5) Performance levels must exceed demands of law and regulations and encourage innovation; (6) Improvements encouraged by BREEAM are achievable and cost effective.[30]

BREEAM for Communities assesses eight different categories including climate and energy, place, shaping, community, ecology, transport, resources, business, and buildings. Also using a rating scale, credits are awarded for these categories according to their performance against BREEAM's defined sustainability objectives and planning policy requirements.[31] The credits for all eight of the categories are added together to produce a total score that determines a rating of "pass", "good", "very good", "excellent", and "outstanding".[32]

Other Neighborhood Assessment Tools

Aside from BREEAM and LEED, there are countless other tools, large and small, that are designed and administered to assess neighborhoods and communities around the world. However, small tools like Walkscore, the Physical Activity Resource Assessment (PARA), and ANC are typically very narrow in scope. For example, Walkscore only assesses the walkability in communities and PARA assesses physical activity. Although these assess important aspects of sustainability and health, they are not comprehensive to be used as a stand-alone measurement for sustainability in communities.

CRITIQUE

There are many benefits to using building standards, as they help ensure that buildings and communities are reliable, safe, and of good quality. However, two of the most commonly found criticisms of the overall concept of green building standards revolve around their feasibility and effectiveness. The cost of green construction alone is usually higher than standard construction and the cost of registering a project for green certification can be a deal breaker. Depending on a project's size, the certification process that cost more than $20,000.[33] For LEED, it can cost anywhere from $8,000 to $20,000 to register.[34] These standards can also be very time consuming and bureaucratic. These standards also fail to sufficiently address many very vital aspects, such as health and wellness.

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WELL BUILDING STANDARD OVERVIEW

WELL BUILDING STANDARD

In October 2014, WELL Building Standard Version 1.0 was publicly introduced to the building industry as the world's first building standard designed for human health and wellness. Being the first of its kind, the standard brought to light a unique approach in building practice that integrates concepts like behavioral health and physiological health into the way that we design, construct, and operate commercial, residential, and institutional buildings.

Developed by Delos Living in partnership with leading practitioners from institutions such as the Mayo Clinic and the Cleveland Clinic, the WELL Building Standard is a "product of seven years of research and development consulting with an expert review process encompassing a scientific, practitioner, and medical review."[1] Although the standard was created by real estate company Delos Living, it is administered by the International WELL Building Institute, a public benefit corporation created by Delos and backed by the Clinton Global Initiative.[2]

WELL, unlike many other green building standards, is performance-based, meaning that, in order for a building to achieve certification, it's features must pass an established set of requirements and thresholds by undergoing an intensive process that includes on-site assessments, as well performance tests completed by a third-party.[3] Once certified, projects must be re-assessed every three years by the International WELL Building Institute to maintain its certification.[4]

As of October 2014, nearly eight million square feet of real estate had already been registered to be WELL Certified through the standards pilot program.[5] Some of the first WELL Certified spaces include a condo building at 66 E 11th Street in New York's Greenwich Village, StayWELL Suites and Meetings at the MGM Grand Resort & Hotel in Las Vegas, and the CBRE World Headquarters office in Los Angeles, California.[6]

Currently the standard can be applied to three typologies including: New Construction and Major Renovations, Tenant Improvements, and Core and Shell Developments.[7] Although the standard has been used for a variety of building types, future refinements will be designed to specifically address building types such as healthcare facilities, schools, multi-family homes, and sports facilities.[8]

STRUCTURE OF WELL BUILDING STANDARD v1.0

WELL Standard v1.0 is broken down into seven categories called "Wellness Concepts", which include mind, comfort, fitness, light, nourishment, water, and air.[9] Each concept identifies and addresses respective health conditions through a range of applicable pre-condition or optimization features. Table 3.1 on the next page provides an overview of the seven wellness concepts and their health objectives.

TABLE 3.1: WELLNESS CONCEPT OVERVIEW

Air - To achieve medically validated performance-thresholds for healthy indoor air quality.

Water - To implement design technology, and treatment strategies in order to achieve optimal water quality for all internal water uses.

Nourishment - To implement strategies to encourage healthy eating habits for building inhabitants.

Light - To provide room illumination that minimizes disruption to the body's circadian rhythm and provides appropriate illumination for all tasks.

Fitness -To provide building occupants with numerous opportunities for physical activity.

Comfort - To create an environment that enables occupants to experience comfort, both physically and mentally.

Mind - To implement design, technology, and treatment strategies in order to provide a built environment in which mental and emotional wellbeing is enriched.

(Source: International Well Building Institute, 2014)

TABLE 3.2: WELL CERTIFICATION TYPES

To achieve:	A project must meet:
Silver Certification	100% of Preconditions applicable to project type
Gold Certification	1) 100% of Preconditions applicable to project type
	2) 40% or more of Optimizations
Platinum Certification	1) 100% of Preconditions applicable to project type
	2) 80% or more of Optimizations

(Source: International WELL Building Institute, 2014)

TABLE 3.3: WELLNESS CONCEPT BREAKDOWN

FITNESS		
Feature: Structured Fitness Opportunities		
Part 1:	Professional Fitness Program - The following are offered:	
	Requirement A:	Onsite fitness or training programs
Part 2:	Fitness Education: Classes from a qualified professional are offered to cover the following:	
	Requirement A:	Different modes of exercise.
	Requirement B:	Safe fitness techniques.
	Requirement C:	Comprehensive exercise regimes.

(Source: International WELL Building Institute, 2014)

Pre-condition features serve as baseline requirements for compliance, while optimization features determine the level of certification, as a certain threshold must be met in order to achieve silver, gold, or platinum (Table 3.2). Each feature is broken down further into parts and requirements, as illustrated in Table 3.3.

To date, the WELL Standard has identified a total of 102 features, strategies, and procedures, to be implemented by owners, architects, engineers, and users of a building.[18] Delos Labs is credited for the development of respective features such as aromatherapy systems, ergonomic flooring, circadian lighting systems, and vitamin-c infused showers. These features are just a sample of the many features that exist or are in development

CRTIQUE

Although WELL certified buildings have potential to allow people to live happier and healthier, the standard has not existed long enough for data to be to be sufficient in proving the standard's successes or failures. With the WELL standard being as new as it is, I imagine that many of the technologies needed to become eligible for WELL certification are expensive. Costly technology could present a significant barrier to access for the average person or business, especially with the industry focused on reducing costs rather than adding them. However, LEED at one time, was very costly, and is becoming customary for new building construction.[20] WELL Standard also doesn't provide an individual standard that addresses the outdoor environment, which presents the question of whether it can address the outdoors or not that I propose to address.

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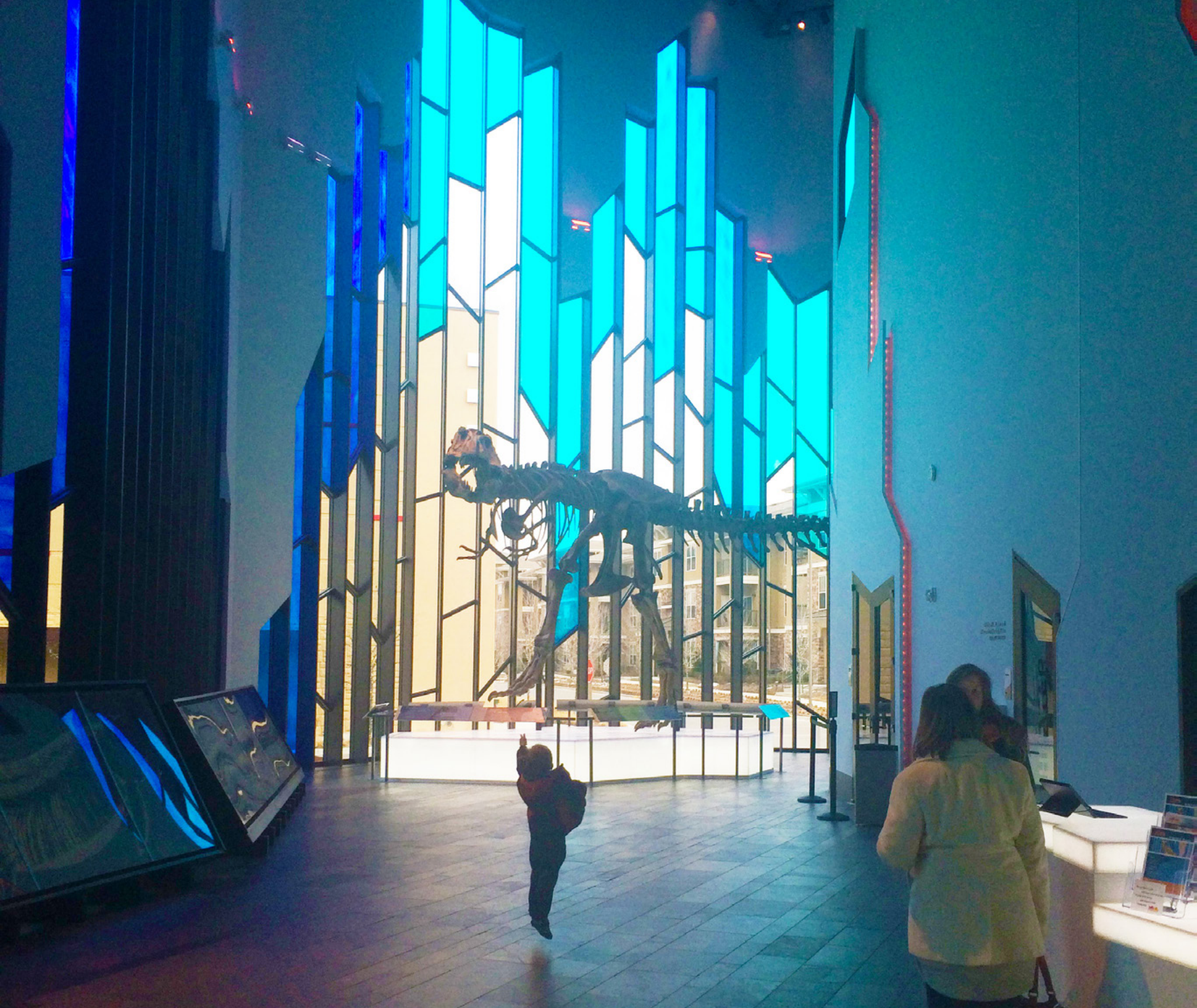
METHODOLOGY

The WELL Building Standard is the most comprehensive health-focused building standard to-date with 7 "Wellness Concepts", totaling 102 features that are supported by medical research and designed to improve health outcomes Therefore, WELL Building Standard v1.0 was chosen as the basis for my research and literature analysis. Aside from analyzing literature specific to the WELL Building Standard, I explored additional health-related studies, concepts, strategies, and theories to create a concept for a standard that is direct and comprehensive in addressing community health.

The literature that was studied throughout this research project included WELL Building Standard v1.0 and LEED Neighborhood Development, in addition to health-based books, periodicals, academic journals, and websites that I found via search engines and databases.

ANALYTIC STRATEGY

PHASE 1: WELL STANDARD ANALYSIS + SYNTHESIS

Using the WELL Standard as a model, it was necessary to first understand the structure of the standard to determine ways that the standard's overarching health concepts could be applied into the context of a community. The first step of this process consisted of a literature analysis and synthesis of WELL Building Standard v1.0 to identify and define the following Wellness Concepts: Air, Water, Nourishment, Light, Fitness, Comfort, and Mind. During this analysis, I synthesized each of the Wellness Concepts by breaking them down into groups of respective themes (Figure 1). After analyzing the collected themes, I used them to find connections to several major community health issues such as obesity, health equity, fitness deserts, and air pollution. After making these connections, I found that the Light and Comfort concepts were not justifiable enough to keep as standalone wellness concepts due to a lack of research connecting them to community health issues or outcomes. Therefore, I omitted the Light and Comfort wellness concepts, but later included some small components of them in other wellness concepts. Making these changes helped me to better develop a new set of objectives for community-focused wellness concepts. Overall, this entire process allowed me to carry over the rudimentary

principles of the WELL Building Standard, which was beneficial for maintaining some level of consistency with the standard.

PHASE 1.1: DEFINING "COMMUNITY"

To make the conceptual standard as clear and cohesive as possible, it needed to focus on a specific community type. After exploring several suitable community types, I decided that the conceptual community standard would be designed specifically for Master-planned Communities. This was a very critical decision, as it allowed me to strengthen my research parameter and develop more specific features and parts. My rationale for choosing master-planned communities was primarily due to their large scale, but also for the following characteristics that are I found to be common in this particular community type:

- Finite Boundaries.
- Typically developed, owned, and operated under a single entity.
- Privately owned.
- Contain a mix of uses and amenities.
- Often offer a variety of housing types at different price-points.
- Typically maintained through homeowners/amenity fees.
- Typically have a homeowners association or board.

With the master-planned community being the chosen community type, I decided to break it down into two categories for the purpose of clarity: Community Improvement and New Construction. Master-planned communities that fall into the Community Improvement Category would include any existing master-planned community that wishes to make improvements to their community to achieve health goals, while master-planned communities that fall into the New Construction Category would include any development that is in the site planning and design phase. Acknowledging that New Construction would offer more design flexibility than an existing community, I developed some parts of my standard to pertain specifically to new construction projects. For example, a requirement for a substantial requirement involving allocation of open space for a particular use is only applicable to a New Construction project because an existing project may be fully built out and in that case would not be able to meet that requirement.

PHASE 2: TRANSLATION

The second phase of my research consisted of using the new community objectives that identify which individual components of the WELL Building Standard could be carried over to address health outcomes in the context of community planning and design strategies. Considering that the Well Building Standard has 7 Wellness Concepts containing 102 features and even more parts and requirements, this phase involved a much more in-depth analysis of the WELL Building Standard. To determine the applicability of a given feature, part, or requirement, I used my own understanding of community planning and design that I acquired through professional, educational, and personal experiences to judge their rationality and practicality. For example, when reading the Well Building Standard's literature on the Humidity Control feature of the Air wellness concept, I found that the feature was very specifically designed for a controllable indoor environment and would not be applicable in addressing community health in my standard. Given that WELL Building Standard was designed for the design, construction, and maintenance of a building, there were many of these features that were only applicable to indoors. Other examples include serving size requirements or workplace health policies, which would be too excessive to regulate at a community level.

PHASE 3: SUPPLEMENTARY RESEARCH AND ANALYSIS

Of the 5 remaining wellness concepts, I found that the features, parts, and requirements of Fitness and Nourishment had the most applicability, which is likely attributable to their relevance to community health issues. Despite Air being a major community/public health concern, it had the least applicable components due to their specificity for indoor environments. With results beginning to form during this process, I began reviewing addition health-based literature to identify new health concepts that could be incorporated into the conceptual standard. During this phase a new wellness concept was added and called Community Vitality to provide an organizational framework that would better support the complex needs of communities. Considering that the scale of a master-planned community is much bigger than the scale of the WELL Building

Standard, this conceptual standard would require many new components that address community specific topics like social programming, healthcare access, and social programming, which can all help in promoting the achievement of health goals. Community Vitality also includes more features relevant to the planning and design process of a community, such as community development workshops and health advocacy.

PHASE 4: DEVELOPMENT OF STANDARD

As I developed the concept model for the community standard, several features were added to, omitted, adapted, and move around. This had much to do with the nature of the standard I was creating and the audience it would be more directed towards, such as community planners, advocates, landscape architects and real estate developers. For example, the survey and integrative design features of the WELL Building Standard's Mind concept made more sense to move to the Community Vitality concept of the community standard, as they both seemed necessary for creating the structure of the community. I organized each of the features into a standard structured similarly to the WELL Standard. The conceptual standard that I created keeps the term Wellness Concepts, but uses the term Health Amenities in place of the term Features to better reflect their role in communities. Though they serve the same purpose, the Pre-Conditions of the WELL Standard are referred to as Standard Requirements in the conceptual community standard for the purpose of clarity.

CONCLUSION

The analysis and synthesis of literature was vital to understand the ways in which the social and physical design of our communites can influence various health outcomes at the both the individual level and the community level. Through this research process, I hoped that standard setting institutions, policymakers, and planners might be presented with a new avenue for approaching community health issues.

CONCEPT	OBJECTIVE AND COLLECTED THEMES	ASSOCIATED COMMUNITY HEALTH ISSUES	NEW CONCEPTS	NEW OBJECTIVES

AIR

To achieve medically validated performance-thresholds for healthy indoor air quality.*

Air Quality, Upper Respiratory Health, Pathogens, Air Cleaning, Asthma, Allergies, Odor Control, Pollution

WATER

To implement design technology, and treatment strategies in order to achieve optimal water quality for all internal water uses.*

Water Quality, Water Treatment, Toxins, Contamination, Sediment, Hydration, Conservation, Cardiovascular Health, Gastrointestinal health, Hygiene

NOURISHMENT

To implement strategies to encourage healthy eating habits for building inhabitants.*

Weight Management, Awareness, Cancer Risk, Food Accessibility, Eating Habits, Obesity, Healthier Diet, Nutrients, Processed Foods, Nutrition, Food Production, Sustainability, Fruits, Vegetables

LIGHT (OMITTED)

FITNESS

To provide building occupants with numerous opportunities for physical activity.*

Physical Activity, Weight Management, Muscle Strength, Cardiovascular Health, Fitness Awareness, Fitness Education, Fitness Programs, Stress Reduction, Active Lifestyle, Fitness Space

COMFORT (OMITTED)

MIND

To implement design, technology, and treatment strategies in order to provide a built environment in which mental and emotional wellbeing is enriched.*

Noise Reduction, Acoustics, Wellbeing, Nature, Anxiety, Depression, Stress, Awareness, Knowledge, Information, Biophilia, Learning, Nature, Safety

COMMUNITY VITALITY (ADDED)

Awareness, Advocacy, Healthcare, Community, Social Interaction, Programming, Community Planning, Collaboration, Support, Equity

* Description from Well Building Standard

ASSOCIATED COMMUNITY HEALTH ISSUES

- OBESITY
- PHYSICAL INACTIVITY
- HEALTH EQUITY
- FOOD DESERTS
- FITNESS DESERTS
- DEPRESSION
- AIR POLLUTION
- CANCER
- INFECTIOUS DISEASE
- TOBACCO USE
- HEALTHCARE ACCESS

AIR

To establish requirements that help to reduce pollution and support the health and well-being of community residents.

WATER

To achieve optimal water quality and usage throughout the community using innovative design and treatment strategies.

NOURISHMENT

Requires design, technology, and treatment strategies designed to provide a physical environment that optimizes cognitive and emotional health.

FITNESS

To seamlessly integrate exercise and fitness into everyday life by providing residents with an abundance of community amenities that promote physical activity for all ages.

MIND

To implement design strategies and outdoor features that improve food accessibility while also educating, promoting, and encouraging the community to develop healthier eating habits.

COMMUNITY VITALITY

To recognize the power of communities by providing the necessary policies, strategies, processes, and resources needed for residents to join together in living a healthier life.

= DEVELOPMENT OF STANDARD

CONTENT DISCLAIMER

The conceptual standard that was developed in this research report was modeled similarly to the WELL Building Standard, which is a product of the International WELL Building Institute and Delos Living, LLC. However, it must be acknowledged that the concept and any new content introduced in it do not reflect or represent the views, opinions, or plans of the International WELL Building Institute, Delos Living LLC, or affiliates.
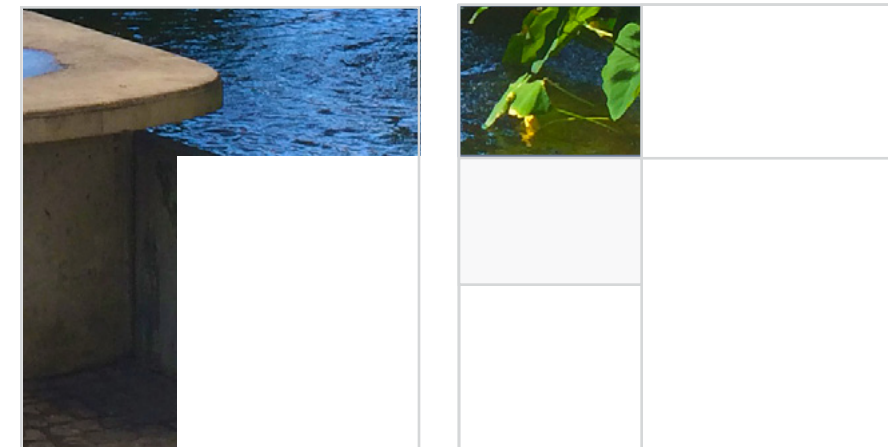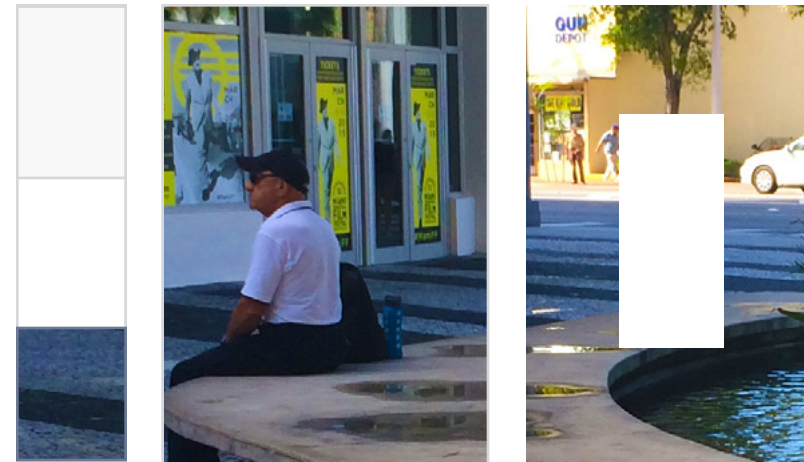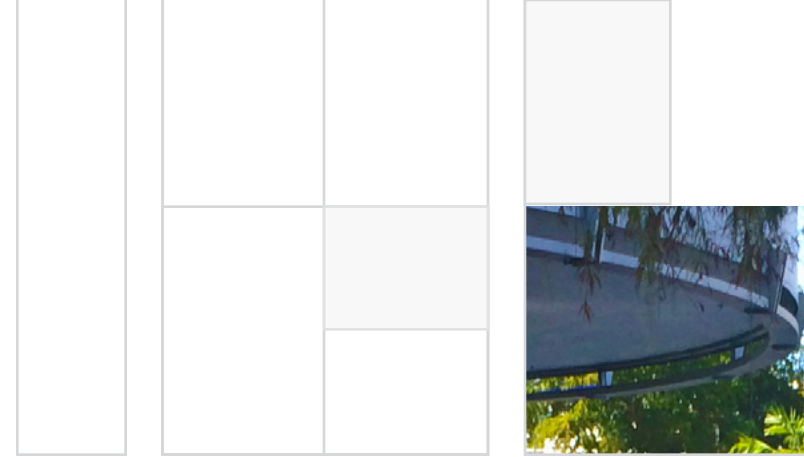
WELL COMMUNITIES

WELL COMMUNITIES

Communities have often been considered determinants of health outcomes with people, programs, and amenities that can facilitate healthy or unhealthy lifestyles. Nonetheless, many of the communities built over the past few decades were simply designed for comfort and convenience with health commonly being an afterthought. Partially due to this, a myriad of public health issues have developed, prompting health concepts to be further studied and integrated into the "triple bottom line" of public and private sector development. As a response to these changes, I have developed the concept Well Communities, which is a standard for measuring the health awareness of a community.

Modeled after the WELL Building Standard, the conceptual Well Communities standard addresses major health concerns by placing health at the forefront of community planning and design. Through an examination of WELL Building Standard v1.0, many of the original concepts were utilized and applied into the context of communities, while also building upon them for a more robust conceptual model.

The concept of the Well Communities standard is intended to encourage developers, urban planners, landscape architects, architects, developers, and engineers to join together in wholly integrating health into the design of new and existing communities to further improve quality of life and health. A community that achieves a Well Communities designation has proven that it is committed to unceasingly improving the fitness, nutrition, mood, and performance of its residents and is achieved by implementing policies, strategies, programs, and technologies to facilitate healthier and happier lifestyles.

VERSION 1

Given that many communities are vastly different than one another, a one-size-fits-all approach was deemed impractical for the nature of this report. Therefore, future expansions of the community standard could encompass several different community types including: Resorts, University Campuses, Retirement Communities, Municipalities, Community Improvement Districts, Corporate Campuses, and Master-planned Communities.

SUMMARY

The following sections of this report present an overview of the structure of Well Communities, as well as the wellness concepts: Community Vitality, Fitness, Nourishment, Mind, Air, and Water. Version 1 of the conceptual WELL Community Standard has been developed specifically for master-planned communities, but could be adapted to fit other community types.

COMMUNITY TYPES

CITIES

RESORT COMMUNITIES

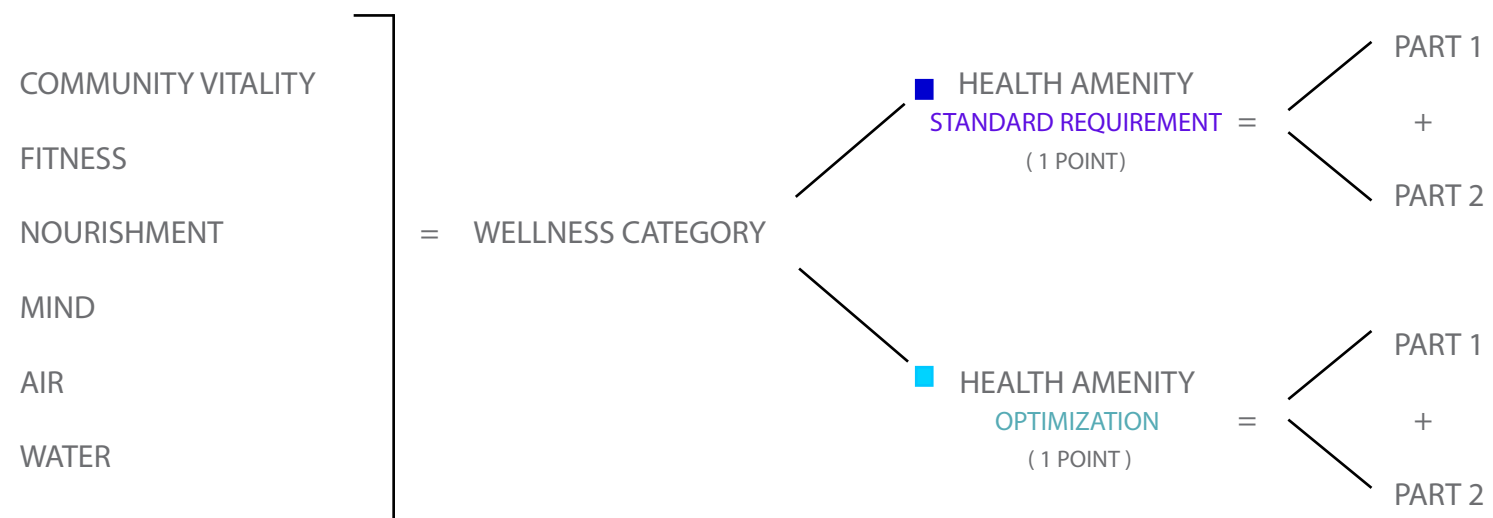APARTMENT + RETIREMENT COMMUNITIES

MASTER-PLANNED COMMUNITIES

5.1

COLLEGE CAMPUSES

CORPORATE CAMPUSES

WELL COMMUNITIES

FIGURE 5.1: STRUCTURE DIAGRAM

COMMUNITY VITALITY

FITNESS

NOURISHMENT   =   WELLNESS CATEGORY

MIND

AIR

WATER

■ HEALTH AMENITY
STANDARD REQUIREMENT =
(1 POINT)

PART 1

+

PART 2

■ HEALTH AMENITY
OPTIMIZATION   =
(1 POINT)

PART 1

+

PART 2

The Well Communities Standard is organized similarly to the WELL Building Standard with six health-focused categories called Community Wellness Concepts including: Community Vitality, Fitness, Nourishment, Mind, Air, and Water. Each Community Wellness Concept is comprised of Health Amenities, which are divided further into Parts containing specifications for improving health outcomes.

INTENT OF HEALTH AMENITIES

The Health Amenities of the Well Communities standard were established to address health issues that have come as a result of urban and suburbanization and poor community design. These health amenities are intended for be integrated into the design of communities to influence human behavior and ultimately encourage people to collectively engage in a happier and healthier lifestyle. By synthesizing major community health issues and connecting them with design strategies, protocols, and policies, this document provides a collection of several common and emerging planning practices that can be incorporated to achieve specific health outcomes.

HEALTH AMENITY TYPES

There are two categories of Health Amenities applicable to all levels of Well Communities certifications:

■ 1) STANDARD REQUIREMENTS

Standard Requirements represent the core of the Well Communities Standard, as they provide critical elements for the planning, designing, and structuring of the community. These requirements also contain features that have been found as common practice today in master-planned communities. Standard requirements are intended to work as a foundation for which a project can build upon to achieve higher levels of community health.

■ 2) OPTIMIZATIONS

According to Merriam-Webster Dictionary, Optimization is defined as *"an act, process, or methodology of making something (as a design system, or decision) as fully perfect, functional, or effective as possible".* [1]Optimizations are not required to achieve Well Communities Silver Certification, but provide opportunity for projects that wish to achieve higher levels of certification. Optimizations include technologies, strategies, protocols and designs that can be applied to qualify for Gold or Platinum level WELL Community Certification, depending on the percentage of optimizations that are achieved.

HEALTH AMENITIES, PARTS, AND REQUIREMENTS

The WELL Community Standard is composed of 36 Health Amenities (Standards and Optimizations) that are all applicable to a new or improved Master-Planned Community. The Parts found within each Health Amenity contain one or more specifications that outline the policies, strategies, parameters, or metrics that are to be fulfilled in order to gain credit for a whole Health Amenity. Each Health Amenity is worth 1 Point and in order to acquire the point, a project must satisfy all of a Health Amenities individual Parts and Requirements.

OVERVIEW

ELIGIBILITY

In order for a master-planned community to be eligible for registration, the master-planned community must, at minimum, have a governing body to assist in upholding the designation as a Well Community. A governing body for a master-planned community would likely be a homeowner's association, but could also be any local government, student government, community improvement district, or management company that is committed to the implementation and administration of the Well Communities Standard.

A governing body is a critical for the success of a Well Community, as such a project relies heavily on the organizational capacity of a community. For example, a community that offers structured fitness opportunities will likely need to hire a certified staff of trainers, which would need to be paid by residents through an amenity fee.

Although no specific size requirement exists, the standard was designed optimally for a master-planned community of 2,000 residents or greater.

TABLE 5.1: COMMUNITY TYPE BREAKDOWN

Community Type	Standard Requirements	Optimizations	Total
Master-planned Community	18	18	36

HEALTH AMENITIES

FIGURE 5.2: HEALTH AMENITY OVERVIEW

COMMUNITY VITALITY
- 1. Integrative Community Planning + Design
- 2. Advocacy
- 3. Health Anchor
- 4. Programming
- 5. Social Equity
- 6. Community Surveys
- 7. Healthcare Access

FITNESS
- 8. Active Pattern + Design
- 9. Active Transportation Support
- 10. Structured Fitness Opportunities
- 11. Fitness Spaces
- 12. Outdoor Fitness Equipment

NOURISHMENT
- 13. Food Security
- 14. Edible Landscaping
- 15. Processed Foods
- 16. Farm to Table
- 17. Hand/Food Cleaning Stations
- 18. Food Advertising
- 19. Mindful Eating Spaces

MIND
- 20. Biophilia
- 21. Knowledge
- 22. Inspiration
- 23. Self-Monitoring
- 24. Safety
- 25. Noise Reduction
- 26. Wildlife Preservation

AIR
- 27. Community Smoking Ban
- 28. Air Pollution Monitoring + Display
- 29. Arboretum
- 30. Automobile Reduction
- 31. Solid Waste Management

WATER
- 32. Fundamental Water Quality
- 33. Contaminant Reduction
- 34. Public Water Additives
- 35. Natural Filtration Systems
- 36. Clean Drinking Water Access

■ = Standard Requirements (18)

■ = Optimizations (18)

CERTIFICATION OVERVIEW

It is recommended that a project registers for certification before the planning and design process because it will ensure that all objectives are achieved from start to finish. However, a community can register at any time. Like the WELL Building Standard and similar standards, there are levels of certification that can be achieved. Well Communities follows that of the Well Building Standard with silver, gold, and platinum levels of certification which are broken down on the next page.

The level of certification is determined by the achievement of all standard requirements and the percentage of Optimization Health Amenities needed. A Platinum certification ultimately represents a higher level of health awareness than the Silver certification. Below are the steps needed to become certified as a Well Community.

1) CONSULTATION   2) APPLICATION   3) REGISTRATION   4) COMMISSIONING   5) CERTIFICATION

1 CONSULTATION
Prior to the filing of an application, the project owner/s and the design team must schedule a consultation with personnel to review the Well Communities Standard.

2) APPLICATION
The lead project team member will file an application with Well Communities.

3) REGISTRATION
If the project is accepted, the project can be registered and granted access to tools that will assist in the project's development. Projects seeking WELL Community certification would need to be registered through a registration platform similar to what was established for the WELL Building Standard.

4) COMMISSIONING
Well Communities Personnel will be appointed to overlook the project through all phases of planning, design and construction to address any concerns along the way and to ensure that all processes and strategies required in the standard are being followed.

5) CERTIFICATION
Upon completion of the project, Well Communities personnel will assess the project and determine what level of certification the project achieves based on the scoring model on the next page.

RATING SYSTEM OVERVIEW

The assessment for WELL Communities was modeled after Well Building Standard v1.0.

FIGURE 5.3 WELL COMMUNITIES RATING SYSTEM

SILVER CERTIFICATION
+ 100% of Standard Requirements
+ 15 acres of Community Space / 1,000 residents (Only Applicable to New Construction)
+ 0 Optimizations

GOLD CERTIFICATION
+ 100% of Standard Requirements
+ 20 acres of Community Space / 1,000 residents (Only Applicable to New Construction)
+ 40%-79.9% of Optimizations

PLATINUM CERTIFICATION
+ 100% of Standard Requirements
+ 25 acres of Community Space / 1,000 residents (Only Applicable to New Construction)
+ 80%+ of Optimizations

	STANDARD REQUIREMENTS		SILVER OPTIMIZATIONS		GOLD OPTIMIZATIONS		PLATINUM OPTIMIZATIONS	
	Points Possible	Points Achieved	Points Possible	Points Achieved	Points Possible	Points Achieved	Points Possible	Points Achieved
Community Vitality	6	6	1	0	1	1	1	1
Fitness	2	2	3	0	3	1	3	3
Nourishment	3	3	4	0	4	4	4	4
Mind	2	2	4	0	4	2	4	3
Air	2	2	3	0	3	1	3	1
Water	3	3	3	0	3	4	3	4
TOTAL	18	18	18		18	13	18	16
	% Achieved	100%	% Achieved	0	% Achieved	72.2%	% Achieved	88.9%
	% Needed	100%	% Needed	0	% Needed	40-79.9%	% Needed	80% +

CERTIFICATION PROCESS

From start to completion, the Well Communities certification process is largely dependent on constant collaboration and communication among project leaders and personnel, in addition to required documentation and reporting. Project leaders are required to submit a detailed report each month indicating all progress toward achieving each of the community wellness concepts, concepts, and features. The report would also include any necessary plans, drawings, and construction photos to provide visual aid to assessors. Throughout the certification process, the appointed assessor will continuously review all project documentation and also perform bi-monthly on-site evaluations to monitor and document progress, address issues, and verify completion of health amenities and features. The intent of the on-site visits are to maintain communication and provide on-going evaluation so that project leaders are aware of their performance and progress.

Once the assessor validates completion of all of the standard requirements and optimizations, the project will undergo a final assessment for certification. The final assessment will performed by an assessment team, rather than an individual assessor to ensure that each of the requirements for certification have been met. Failure to get signed off on any of the standard requirements will result in rejection. However, the project leaders are given the opportunity to make improvements. In the evaluation of the optimization health amenities, all of the optimization features are weighted the equally.

COMMUNITY VITALITY

BACKGROUND

Through thoughtful design and a solid social structure, communities can be powerful forces in influencing widespread positive change. These changes not only carry the potential to provide significant health benefits, but they could also carry the potential to stimulate economic development and prosperity. Nonetheless, these changes are often not possible without proper planning, strategies, resources, and most importantly, collaboration, to develop shared goals and interests. Collaboration across all sectors is critical to the vitality and cohesiveness of a healthy community and the impact of their health amenities.

INTENT

To recognize the power of communities by providing the necessary policies, strategies, processes, and resources needed for residents to join together in living a healthier life.

HEALTH OUTCOMES

Health benefits of Community Vitality include improved:
- Social Health
- Mental Health
- Physical Health
- Physiological Health
- Emotional Health
- Health Access
- Longevity

5.2

■ INTEGRATIVE COMMUNITY PLANNING AND DESIGN
1. Stakeholder Charrette
2. Community Development Workshop
3. Health Impact Assessment
4. Community Development Plan
5. Stakeholder Orientation

■ ADVOCACY
1. WELL Community Ambassadors
2. WELL AP Certification
3. Health Sessions

■ HEALTH ANCHOR
1. Health Anchor

■ PROGRAMMING
1. Social Calendar
2. Social Calendar Promotion
3. Networking
4. National Health Observances
4. Philanthropy

■ SOCIAL EQUITY
1. Integrated Affordable Living
2. Aging in Place Support

■ COMMUNITY SURVEYS
1. Community Happiness Survey
2. Community Health Survey
3. Information Reporting

■ HEALTHCARE ACCESS
1. Health Training and Certifications
2. On-site Community Physicians

INTEGRATIVE COMMUNITY PLANNING + DESIGN

According to WELL Building Standard v1.0, "*a truly collaborative design process ensures that the construction and up keep of a space follows the original expectations and goals of the building.*"[2] Though this was said for buildings, the same can apply to various community initiatives, as it is considered to be advantageous for groups of individuals with common interests to join together to establish and achieve shared goals.[3] Collaboration can provide many other benefits such as community synergy and community awareness, which can also encourage healthier behavior and habits.[4] In other words, the more integrative a project's planning and design process is, the more likely it might be that residents will develop a strong sense of pride and ownership.

This health amenity and its parts are designed to encourage communication throughout all phases of the project between decision-makers and citizens to ensure that shared health goals and issues are addressed and integrated into the design of the community.

### PART 1: STAKEHOLDER CHARRETTE[5]
Prior to project design and construction, all stakeholders, including the project developer, owner/s, planners, architects, engineers and the facilities management team meet to:
- a. Discuss the needs of current or future residents, focusing on health and wellness.
- b. Perform a values assessment and alignment exercise within the team to inform any project goals as well as strategies to meet occupant expectations.
- c. Set future stakeholder meetings to stay focused on project goals and engage future stakeholders who join the process after the initial meeting, such as contractors and sub-contractors.

PART 2: COMMUNITY DEVELOPMENT WORKSHOP
To encourage involvement in the project and ensure cohesiveness, residents of the community or surrounding communities will be invited to participate in the following activities:
- a. A minimum of 1 Community Development Workshop designed for all age groups, focusing on various health and wellness topics. The workshop can increase interest in the project and can help build a stronger sense of ownership and pride.
- b. A minimum of 1 follow-up survey or meeting is necessary to ensure that everybody is allowed the opportunity to voice their opinions and share ideas.

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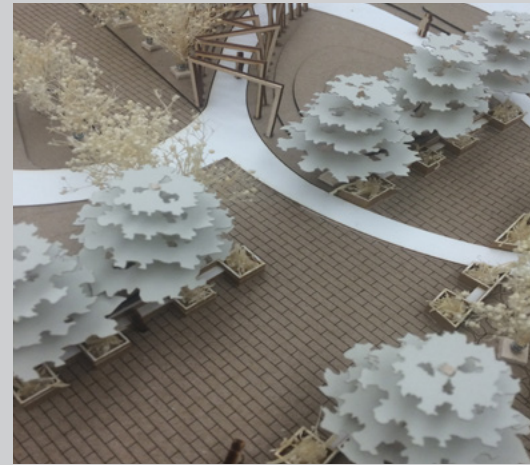
INTEGRATIVE COMMUNITY PLANNING + DESIGN (CONTINUED)

PART 3: HEALTH IMPACT ASSESSMENT
To quantitatively gauge the health needs of the surrounding community's population, the following will be facilitated:
- a. A Health Impact Assessment (HIA) a year after WELL Community certification to help project stakeholders make informed choices about alternatives or to determine what improvements needed to better promote health in the community. According to the World Health Organization, HIA's is a way of assessing health impacts of policies, plans, and projects.[6]

PART 4: DEVELOPMENT PLAN [7]
A detailed formal document covering the community's health goals is produced after review and approval from all stakeholders and incorporates the following elements:
- a. Implementation of Well Community Health Amenities.
- b. Operation and maintenance plans for facility managers and policy requirement to ensure that the health goals of the community are carried out.

PART 5: STAKEHOLDER ORIENTATION [8]
Upon completion of new construction or improvements, the designers, project owners, managers, and facilities staff must:
- a. Tour the health features and see demonstrations of how the Health Amenities are intended for use. It must be noted that if the development is ever to be sold that the new owner or owners are given the same orientation before purchasing, the development.
- b. Discuss how community operations will support adherence to the WELL Communities Standard.

5.5

5.6

5.7

ADVOCACY

Advocacy plays a critical role in the spreading of community health awareness.[9] Without advocacy, issues and goals can become unclear, which can make it more difficult for a community to join together in a cause that they do not truly understand or believe in. Nonetheless, awareness depends on advocates that can join people together to identify goals and build an identity. Advocates not only act as a liaison between community residents and big decision makers, but most importantly, they have the power to educate residents and provide them with the necessary knowledge, resources, and tools that could empower residents to become advocates themselves. Ultimately, successful advocacy efforts can increase the effectiveness of all other health amenities.

This Health Amenity establishes a grassroots or "bottom-up" approach to spreading awareness and strengthening the identity of the Well Community, which can improve health for all.

PART 1: WELL COMMUNITY AMBASSADORS

A number of community ambassadors appropriate for the size of the community will be available to assist and educate prospective residents, new residents, and interested guests through the following activities:

a. Guided Tours that highlight each of the physical health amenities and WELL Certified facilities of the community and their intended health benefits.

b. Outreach through public relations and social media to spread health awareness and keep people up-to-date on the happenings of the community.

c. Report resident's comments or concerns to project owners and managers.

PART 2: AMBASSADOR CERTIFICATION

Community Ambassadors must have one of the following to be eligible for ambassadorship:

a. Ambassador Certification to ensure that the people advocating the community have the highest level of understanding of the standard and its concepts.

b. Training from a WELL AP Certified Professional.

PART 3: HEALTH SESSIONS

To further spread health awareness, health sessions will be offered to:

a. Educate residents on specific health issues.

b. Address personal comments and concerns from residents relating to health amenities.


5.8

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HEALTH ANCHOR

Serving as the nucleus of a Well Community, the "Health Anchor", or clubhouse, should be designed with all aspects of community health and vitality at mind. The Health Anchor is a critical component of Well Communities because it not only offers a variety of health, wellness, and fitness features under one roof, but it does so in a socially engaging atmosphere that can motivate residents to become more attentive to their health, while strengthening the identity and culture of the community.

This health amenity helps residents achieve optimal health by providing year-round access to health and wellness as paid through amenity fees.

PART 1: HEALTH ANCHOR

A WELL-Certified community anchor (clubhouse) must be centrally located within the community and offering the following health-related features:

a. 1 Cardio Room can be used to promote weight loss and improve cardiovascular health.

b. 1 Weight Room to help reduce stress, promote strength building, and improve cardiovascular health.[10]

d. 1 Fresh Cafe & Market offering freshly made fruit and vegetable juices located near fitness rooms to help promote healthy eating habits.

e. Gathering and Event Spaces to encourage social interaction and improve community relations and social health.

f. 1 indoor or outdoor olympic-sized pool with lanes to promote fitness and facilitate healthy competition.

g. Health and Wellness Library containing health-related magazines, periodicals, and books, as well as manuals that describe all Well Community Health Amenities and their health benefits.

h. A minimum of 6,000 SF of Leaseable Space for health-related tenants, such as a sports medicine facility, private practices (dentist, family physicians), a bicycle shop, or nutrition store.

i . Two locker rooms (Men and Women) including showers and saunas for pre-workout and post-workout.

j. 1 indoor or outdoor recreational Fitness Component, which can be tennis courts, soccer fields, basketball courts, or racquetball courts.

k. 1 indoor area for child play designed for a specific age group to facilitate emotional, physical, and social development.[11] Note: For safety, play area or areas must display signage indicating the appropriate age.

l. 1 Wellness Spa to offer massage therapy and anti-aging treatments to ease stress and boost self-esteem.[12]

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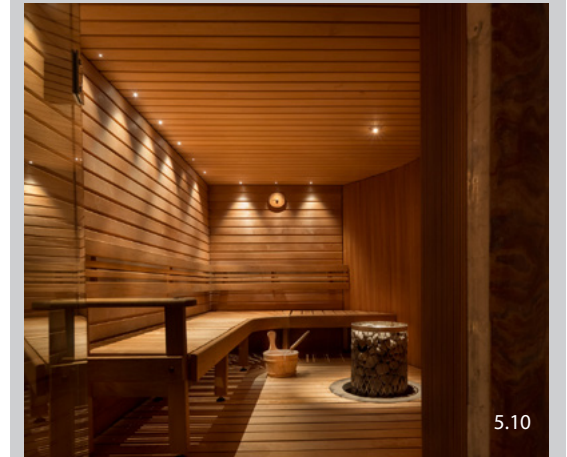
PROGRAMMING

Due to the rise of technology and the impersonal nature of some newer communities, we often lack the meaningful face-to-face connections and experiences that we need for the sake of our personal wellbeing. These societal shifts over the past couple of decades have created an absence of social interaction, which has led to increased disconnect and isolation. In recent years, many developers, planners, and architects have made efforts to improve social interaction by designing streetscapes, buildings, and homes that are reminiscent of our historic towns and neighborhoods. However, in some cases, this practice has done the opposite, meaning that successfully cultivating social connections and establishing a "sense of community" goes beyond design.[13] Social programming is often an effective strategy for creating a strong social environment, as it not only gives residents a reason to get out of their homes, but it can help them build connections and their own sense of belonging.

Residents who develop strong connections within the community can help to strengthen the pride and identity of the community, which can provide many benefits in the overall health outcomes of the community.[14] Therefore, this health amenity promotes community pride and vitality through a robust social structure that encourages residents to become engaged.

PART 1: COMMUNITY CALENDAR
The following must be incorporated into a monthly events calendar:

    a. At least 2 community-wide events per season. These events can include picnics, fundraisers, outings, meet and greets, and movie nights.

PART 2: COMMUNITY CALENDAR PROMOTION
To promote the community's social calendar, the following will be followed:

    a. Bulletin boards located in all community facilities and near community amenities displaying a brief description of the event and the date.

    b. Flyers, sign-ups, periodic announcements through email.

PART 3: NATIONAL HEALTH OBSERVANCES (NHO)
NHO's are days, weeks, or months that are dedicated to spreading health awareness and educating people on pressing health topics.[15] This will be promoted by integration the following into the community calendar.

    a. NHO Calendar

PART 4: PHILANTHROPY
According to the Cleveland Clinic, there are mental and emotional health benefits associated with acts of giving, such as lower blood pressure and increased self esteem.[16] Therefore, the following will be integrated into the community:

    a. A clothing drop-off location located near the Health Anchor.

    b. Annual community-wide philanthropy event, such as a Race for a Cure or Relay for Life.

5.12

SOCIAL EQUITY

Although social equity is a perpetual issue for many planning professionals and communities, it lacks a concise definition which often makes it difficult to assess.[17] This is largely due to the reality that social "equity" or "equality" can carry many different meanings to different people. In Well Communities, Social Equity means a welcoming environment for all people and the standard promotes this by making its health amenities and quality of life accessible to all ages and incomes.

This health amenity is intended to promote social equity through strategies, policies, and protocols that make the community and health amenities as accessible as possible.

PART 1: INTEGRATED AFFORDABLE LIVING
To improve social integration within the community and make Well Community amenitie accessible for all, the following will be offered:

    a. 10% of homes are subsidized for low to working class income households with amenity fees waived.

    b. Subsidies will be offered to reduce month amenity fees for families in need of temporary financial support.

PART 2: AGING IN PLACE SUPPORT
The Urban Land Institute defines aging in place as a "concept of providing infrastructure, services, and opportunities that allow people to live independently in their homes as they age".[18] Well Communities that have a senior population (65 years or older) equal to 10 percent of more of their total population must offer the following features:

    a. A shuttle bus service to increase mobility for seniors to nearby destinations or social activities in or out of the community.

    b. House-calls upon request of seniors to meet with community physicians in the comfort of their own home.

    c. Grocery delivery from the Health Anchor to assist residents with disabilities.

    d. Emergency Response bracelets for immediate contact to emergency services.

    e. Retrofitting of home to accommodate special needs and disabilities through a third-party.

    f. One-floor living options (only applicable to New Construction) for seniors with limited mobility.

    g. Multigenerational housing options that allows seniors to live with their extended family in a private attachment with their own kitchen, living space, bedroom, and bathroom.

    i. For seniors living alone, a Frequent Call Program will be administered to check-in daily via telephone with seniors.

COMMUNITY SURVEYS

Considering the complexity of communities and their health needs, it is difficult to provide a common set of health amenities that will be effective at addressing all of them. Therefore, surveying residents can provide helpful insight into what health amenities are most effective in addressing their needs and how. By conducting annual or bi-annual surveys and reporting the results within 30 days to project owners, managers, and residents, all stakeholders will be able to gauge how their community is performing and identify ways to improve it.[19]

This health amenity requires periodic resident surveys to assess the health of community residents.

PART 1: COMMUNITY HAPPINESS

When assessing the impact of that the communitys features have on the quality of life its residents, it is crucial to obtain constant feedback from residents. A response rate of at least 35 percent must be achieved for the following:

    a. Gross National Happiness Index Survey (Bi-Annual) to determine the community's level of satisfaction and identify strengths and weakenesses of the community.[20]

PART 2: COMMUNITY HEALTH SURVEY

By creating a model similar to the New York City's Community Health Survey (CHS), residents will take part in the following:
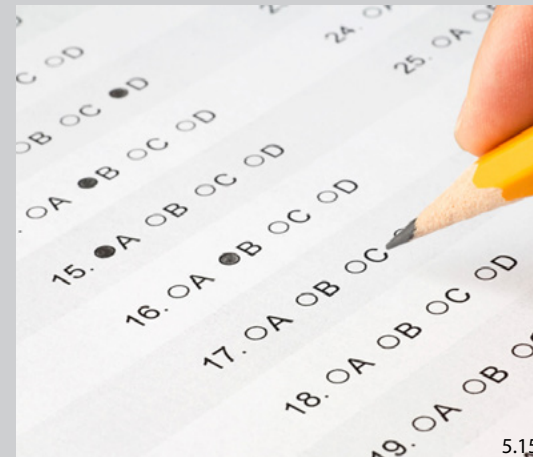
    a. An annual CHS conducted by telephone to track the health of community residents.[21]

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HEALTHCARE ACCESS

According to a report by healthcare company Merritt Hawkins, the average wait time to see a physician in 2014 was 18.5 days.[22] This means that many people currently lack quick and convenient access to quality health services which can result in people waiting to seek medical attention until an emergency health situation arises. Many of these health situations are preventable through periodic doctor visits, however, long lines and wait times can become an impediment.

This health amenity is intended to improve healthcare access, outcomes, and usage by integrating healthcare into the core of the community with on-site physicians, trained community staff, and emergency protocols.

PART 1: ON-SITE COMMUNITY PHYSICIANS

To provide residents with the best possible access to preventative care, the community will provide:

    a. 3 Licensed Physicians per 1,000 Residents. These physicians can either be hired and employed by the community and granted a portion of leasable space or a private practice can lease space in the Health Anchor or located elsewhere within the community.

PART 2: HEALTH TRAINING AND CERTIFICATION

To ensure a quick support for unexpected emergencies, all community ambassadors and health anchor employees must complete the following program through American Red Cross:

    a. First Aid/CPR/AED training to learn how to provide quick support for common emergencies such as cuts, burns, and minor injuries in addition to breathing and cardiac emergencies.[23]

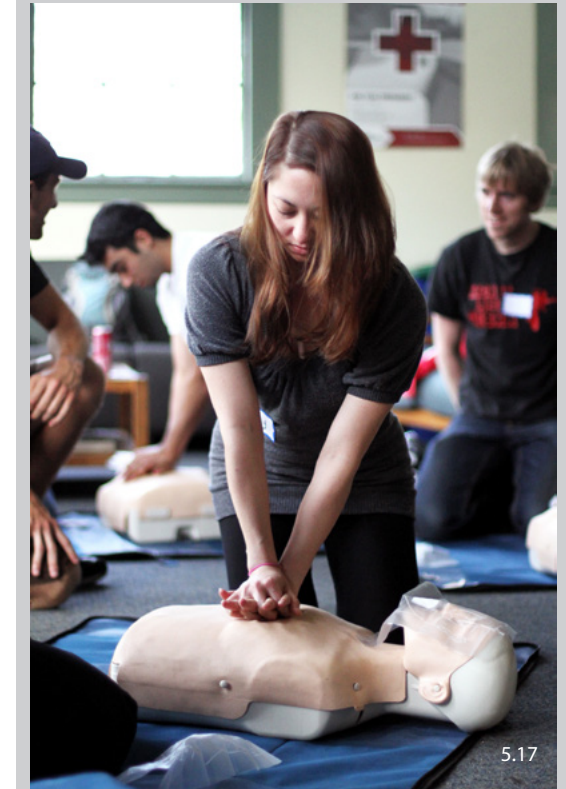### PART 3: FIRST AID KITS

To better prepare residents for personal health emergencies or to provide aid to others in need, First Aid Kits will be:

    a. Located at the entrance of all community facilities for quick response.
    b. Visible with signage displaying emergency protocols.
    c. Checked regularly to replace any outdated or missing contents.

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5.17

COMMUNITY FITNESS

BACKGROUND

Since the introduction of the automobile, the world not only experienced a dramatic transformation of its natural landscape and communities, but also a tranformation of our lifestyles by forever changing the way people interact with the built environment. Sprawling communities have played a major role in inactivity, as their automobile oriented designs have contributed to a significant reduction in social and physical interaction. Though these communities have dominated our landscape over the past several decades, urban migration is beginning to reverse this trend. As humans continue to live longer healthier lives, they will likely continue desiring neighborhoods or communities that are designed to accommodate them. The trend for walk-able and compact developments will likely continue for the foreseeable future and demand environments that promote physical activity and allow access to fitness opportunities.

PURPOSE

WELL Communities are designed to seamlessly integrate exercise and fitness into everyday life by providing residents with an abundance of community amenities that promote physical activity for all ages.

HEALTH OUTCOMES

Potential health outcomes of Fitness include improved:
- Cardiovascular Health
- Physical Health
- Mental Health
- Physiological Health

ACTIVE PATTERN + DESIGN
1. Walkability
2. Fitness Accessibility and Promotion
3. Trail Networks
4. Facilitative Aesthetics

ACTIVE TRANSPORTATION SUPPORT
1. Bicycle Storage and Support
2. Bicycle Rental

STRUCTURED FITNESS OPPORTUNITIES
1. Professional Fitness Programs
2. Fitness Education

FITNESS SPACES
1. Space Designation
2. Outdoor Exercise Spaces

OUTDOOR FITNESS EQUIPMENT
1. Low-Intensity Equipment

5.18

■ = Standard Requirements (2)
■ = Optimizations (3)

ACTIVE PATTERN + DESIGN

From the design of our street scapes and street patterns to the placement of our schools, businesses, and homes, our community's physical design has a large influence on our lifestyles and particularly, our physical health.[24] For much of the past decade, urbanization has contributed to a paradigm shift in the building industry from automobile-oriented design to more pedestrian-oriented design, which has provided many adaptive communities with economic benefits and improved physical activity levels among residents. By creating more active communities, physical activity can become a natural phenonomen, as it was for most of human history.[25] Active communities can improve our physical health, cardiovascular health and mental health, while providing a higher quality of life.

This health amenity is intended to encourage physical activity through various design strategies that promote community's health benefits.

PART 1: WALKABILITY

To improve connectivity to existing areas, public transportation opportunities, and daily physical activity, projects must:

a. Meet all of the requirements outlined in the Smart Location and Linkage component of the LEED for Neighborhood Development Standard (New Construction only).[26]

b. Be built in an area with a Walk Score, Transit Score, and Bike Score of 50 or greater (New Construction only).[27]

c. Integrate traffic calming devices, such as speed bumps, raised pedestrian crossing, road narrowing, or curb extensions at all major pedestrian crossings to increase pedestrian safety. This also includes yield-to-pedestrian signs.

d. Integrate buffers along arterial or connecting roadways to separate drivers and bicyclists from pedestrians.

e. Locate all non-residential buildings within a half mile from 80 percent of residents.

PART 2: FITNESS ACCESSIBILITY AND PROMOTION

Improved access to community fitness spaces and facilities can encourage more frequent use, which can ultimately result in positive health outcomes. Therefore, the following features will be integrated into the design of the community:

a. Wayfinding signage displaying nearby fitness amenities to encourage use.

b. Informational signage displaying the intended health benefits of each fitness area including an estimate of calories and fat burned from 30 to 60 minutes of use.

c. Benches and rest areas for post-exercise recovery.

5.19

ACTIVE PATTERN + DESIGN (Continued)

PART 3: TRAIL NETWORKS

A trail network must be integrated into the community to better connect residences with major health amenities, such as the Health Anchor, outdoor exercise spaces, and nature areas. The trail network must adhere to the following requirements:

a. Designated trails must be a minimum of 10 feet in width to accomodate multiple user types and increased usage.

b. Designated trails throughout the community must be made of natural earth or recycled rubber or polyurethane materials to support healthier joints and endurance. Evidence has supported that these materials are more forgiving on the knees than more commonly used materials (concrete and asphalt) and can also reduce the amount of physical injuries.[28]

c. The trail network must incorporate a minimum of three loops ranging from 0.5 miles to 8 miles to accommodate different levels of endurance.

d. Trails must incorporate wayfinding signage and mile markers to help residents gauge distance.

e. When and if possible, trails must offer in elevation and terrain to improve agility and stability.

PART 4: FACILITATIVE AESTHETICS

Sidewalks and pathways of frequent travel display elements of aesthetic appeal to encourage physical activity through the incorporation of at least 2 of the following:

a. Rotating artwork that is placed strategically to encourage people to walk.

b. Music to enhance the experience of walking through the community.

d. Color-coded activity zones that include games such as hopscotch to encourage children to engage more in outdoor physical activity.[29]

5.20

ACTIVE TRANSPORTATION SUPPORT

Physical inactivity is often due to the nonactive modes of transportation that many people are heavily dependent upon. In fact, the average American commuter spends 38 hours a year sitting in traffic which can directly and indirectly effect our bodies.[30] In other words, our chosen mode of transportation can plays a significant role in our health and wellbeing.

Unfortunately, automobiles are the only viable transportation option for many people due to the sprawling nature of our built environments. However, active modes of transportation, such biking, have increased in popularity throughout the world with many cities and neighborhoods integrating bicycle transportation into exising infrastructure. Such transportation can reduce our carbon footprints and provide benefits to cardiovascular health, making it pressing need for communities.

This health amenity is intended to improve the support and convenience of bicycles in the community for the betterment of community health.

PART 1: BICYCLE LANES
To improve the safety and viability of active transportation modes, the following are required:
    a. Bike lanes with a width of at least 5 feet must integrated into all arterial roads that serve access to community facilities and peripheral areas.
    b. All residential roads should be shared with bicycles with proper signage and reduced speed limits of 15 mph.

PART 2: BICYCLE STORAGE AND SUPPORT
To provide ample support for bicycle transportation, the following will be provided:
    a. Bicycle Repair Stations that includes all of the necessary tools for bike repair and maintenance, including tire pumps, wrenches, screwdrivers, and tire levers. These stations must be located within 100 feet of all major points of interest such as the Health Anchor, outdoor gyms, and commercial areas.
    b. Bicycle racks located in immediate proximity to bicycle repair stations.
    c. Enough bicycle spaces (covered or uncovered) overall to support at least 25% of the community's population to ensure that users will have a safe place to store bicycles.
    e. Safe Crossings.

5.21

FIXIT BICYCLE REPAIR STATION
PROVIDED BY YOUR K-STATE STUDENT UNION*

STRUCTURED FITNESS OPPORTUNITIES

With everday access to fitness professionals and programs, community residents can be better equipped to plan, achieve, and maintain personal fitness goals. Through regular physical activity, residents can improve metabolism, lower their risk for heart disease, improve mental health, and even boost self-esteem. In the form of instructional fitness classes and structured training programs, these opportunities can provide many benefits. For example, fitness Instructors can ensure proper form, challenge people to push themselves harder, and group classes can also be great motivators and make fitness a fun experience.[31]

This health amenity requires the community to offer access to fitness-related advice, classes, and programs.

PART 1: PROFESSIONAL FITNESS PROGRAM
Professional fitness programs can be effective in helping people develop healthier behavioral habits and ultimately achieve fitness goals. Therefore, the following must be incorporated into the community.
    a. Group fitness classes to encourage residents to motivate each other towards achieving goals.
    b. Customizable Personal Training programs that give residents one-on-one attention and help to establish personal goals and closely monitor progress.
    c. Fitness programs and their specific health benefits must be publicly advertised through community outlets such as newsletters, bulletins, flyers, or emails to encourage residents to join.

PART 2: FITNESS EDUCATION[32]
Fitness education is important not only for residents to learn how to their performance, but also to ensure that their exercises are done properly. Classes from a qualified professionals are offered to cover the following:
    a. Different modes of exercise so that residents can learn how to optimize their performance and better achieve goals.
    b. Safe fitness techniques to prevent physical injury.
    c. Comprehensive exercise regimens to provide structure for residents and ultimately develop a healthy fitness routine.

5.22

fitbox
5.23

5.24

FITNESS SPACES

According to a recent study by Gallup, obesity across almost all demographic groups in the United States trended upward to 27.7 percent in 2014, with 4 percent of Americans classified as being "morbidly" obese.[33] With the detrimental health effects that come with obesity, it is imperative that communities continue to promote physical activity through design and programming. Designated fitness spaces can be an effective design strategy that can engage more residents in physical activity and provide many positive health outcomes from increased energy, mood, cardiovascular health, and overall well-being.

This health amenity requires proper outdoor fitness space allocation to facilitate all levels of physical activity for residents. These spaces are intended to be flexible in use allowing for individual or structured group activities such as yoga, pilates, and kickboxing.

Note: For New Construction projects, fitness space should make up 25% of the total community space.

PART 1: OUTDOOR EXERCISE SPACES

To improve access to fitness opportunities, the following must be accessible within a 10 minute walk from any point within the community:

    a. Flexible fitness spaces.

    b. Playgrounds for children ages 4 and older located within view of adult spaces.

    c. Workout stations.

    d. Body of water for water sports.

    e. Sports related spaces, including tennis courts, soccer fields, and baseball fields.

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FITNESS EQUIPMENT

According to the Centers for Disease Control and Prevention, less than half of all Americans are getting a sufficient amount of physical activity with many people not engaging in any form of physical activity at all.[34] While there are many contributors to physical inactivity, it is often due to inaccessibility or what can be referred to as a "fitness desert". To improve the fitness accessibility, many cities and neighborhoods have been implementing features such as outdoor gyms.

The placement of outdoor fitness gyms or equipment in communities has become an increasingly common and successful strategy for promoting physical activity.[35] Whether a full outdoor gym or various exercise machines scattered along pathways and trails, the integration of these features can make fitness convenient, which can help in making exercise habits easier and more achievable.

From static fitness equipment like chin-up and pull-up stations to more rigorous and interactive resistance equipment like rowing machines, this health amenity is intended to appeal to all fitness and age levels.

PART 1: LOW-INTENSITY EQUIPMENT

A combination of the following types of equipment are accomodated by safety instructions and provided in designated fitness areas and or scattered along fitness trails to accommodate use by 50 percent of the community's population:

a. Endurance-Training Equipment (Eliptical machines, treadmill machines, cycling machine, stepper machines).

b. Strength-Training Equipment (chest/back press machine, squat press machine, seated crunch machines, rowing machines).

c. Child Play equipment located in immediate proximity to adult fitness equipment areas.

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COMMUNITY NOURISHMENT

BACKGROUND

Although food is more accessible than ever before due to technological advancements, much of the food readily available in our communities is processed, containing heavily refined ingredients that lack nutritional value.[36] According to the WELL Building Standard, these types of ingredients can also interfere with our body's "internal homeostatic mechanisms", which can make foods more difficult to process and increase the risk of numerous chronic diseases.[37]

By increasing the knowledge, accessibility and quality of food in a community, people can develop healthier eating habits and make more informed choices when purchasing food. Well Communities provide a healthy and sustainable food culture by infusing it with an abundance of resources, strategies, and opportunities that help people eat healthier.

INTENT

To implement design strategies and outdoor features that improve food accessibility while also educating, promoting, and encouraging the community to develop healthier eating habits.

HEALTH OUTCOMES

Potential health outcomes of Nourishment include improved:
- Access to Food
- Eating habits
- Physical Health
- Physiolocigal Health

FOOD SECURITY
1. Community Food Assessment
2. Food Access
3. Hunger Support

EDIBLE LANDSCAPING
1. Fruit and Vegetable Variety
2. Fruit and Vegetable Promotion

FARM TO TABLE
1. Community Gardening Space
2. Locally-soucred Food
3. Sustainable Agriculture
4. Humane Agriculture

PROCESSED FOODS
1. Refined Ingredient Restrictions
2. Healthy Vending Machines

FOOD ADVERTISING
1. Advertising Environmental Cues
2. Nutritional Messaging

HAND+FOOD CLEANING STATIONS
1. Hand/Food Cleaning Stations
2. Sanitizer Dispensers

MINDFUL EATING SPACES
1. Patios and Plazas

■ = Standard Requirements (2)
■ = Optimizations (5)

5.29

FOOD SECURITY

Defined as the state in which people have physical, social, and economic access to nutritious food, Food Security is considered one of the most vital aspects of community health.[38] However, many areas lack access to nutritious food options which can be an impediment to achieving health goals. By improving accessibility, communities can enable healthier eating habits, which can provide benefits to cardiovascular and digestive health.

This health amenity improves the food security of the master-planned community, as well as the surrounding community by assessing food needs and developing a plan of action for assistance.

PART 1: FOOD ACCESSIBILITY

To promote healthy eating habits and improve the accessibility of food in the community, the following must be offered:

a. A grocery store or fresh produce stand must be accessible within a 1/2 mile walk from at least 85 percent of community household units.

b. A Farmer's Market must also be located within a 1/2 mile walk from 85 percent of community household units and operate a least once per week for at least six months out of each year Note: A farmer's market outside of the community boundary can satisfy if the farmer's market is within 1 mile.[39]

PART 2: COMMUNITY FOOD ASSESSMENT

To better understand the food climate of the greater community, the following must be facilitated:

a. A Community Food Assessment (USDA) to help residents develop an action plan for providing support that is specific to the needs of the surrounding area.

PART 3: HUNGER SUPPORT

Hunger has no boundaries. Therefore, an effort to minimize hunger in the greater community is made through one of the following:

a. Community Food Bank must be provided for the greater area.

b. Community Food Drive must be held each quarter to maintain food bank inventory.

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EDIBLE LANDSCAPING

Each year, billions of dollars are spent on landscaping our homes and communities, yet much of the landscaping in our yards, along our streets, and in our public spaces provide no other purpose than aesthetic appeal. Considering that most Americans do not get their recommended amount of fruits and vegetables, our landscape can also serve the purpose of improving our eating habits while being aesthetically pleasing.[40] By infusing our surroundings with free, fresh, and healthy foods, people may be more likely to consume them. According to the WELL Building Standard, consuming fresh foods can help people manage their weight and lower their risk of developing chronic diseases.[41]

To encourage residents to make fresh fruits and vegetables a bigger part of their diet, this health amenity requires a variety of accessible fruits, vegetables, and herbs to be easily accessible through edible landscaping.

PART 1: FRUIT AND VEGETABLE VARIETY

To further increase food accessibility and consumption of fresh fruits and vegetables, the following landscaping requirement exists:

a. 30% of community landscaping maintained by management company must be appropriate for human consumption (fruit trees, nut trees, etc.).

b. At least three varieties of fruits indigenous to the region.

c. At least two varieties of vegetables.

d. At least two varieties of herbs.

PART 2: FRUIT AND VEGETABLE PROMOTION

The following must be present throughout the community:

a. Signage promoting edible vegetation areas with color photos of fruits and vegetables and nutrition facts.

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FARM TO TABLE

According to the WELL Building Standard, "*organic and sustainable farming practices are designed to reduce environmental pollution and to increase the quality of life of the livestock that we rely upon for food.*"[42] In recent years, these types of farming practices have grown rapidly as a result of increased health awareness and more discerning food consumers. Making the decision to buy these types of foods is not only good for environmental sustainability, but human health. Organic and sustainable foods reduce exposure to harmful preservatives, pesticides, hormones, and other bacteria.[43]

This healthy amenity requires the integration of sustainable gardening practice, as well as organic food options in local grocery stores.

PART 1: COMMUNITY GARDEN SPACE

Community gardening not only provides environmental and nutritional benefits, but can also improve physical and mental health.[44] Therefore, the following will be offered:

    a. A minimum of 300 square feet of designated garden space per community household (Only applicable to New Construction) to encourage and promote gardening. It can be one large garden or several small gardens throughout the community as long as the minimum space requirement is met.

    b. At least 1 Community Greenhouse to provide rich year-round gardening opportunities.

    c. Agriculture shall not be prohibited in any portion of residential lots.

PART 2: GARDENING SUPPORT

The following features are provided to enhance the production of vegetation in community gardening space/s:

    a. A growing medium to support vegetation growth.[45]

    b. Irrigation to provide gardens with a sufficient amount of water to support growth.

    c. Gardening instruction for residents to learn proper gardening techniques,

PART 3: SUSTAINABLE AGRICULTURE [46]

To ensure that produce is free of harmful fertilizers and pesticides and environmentally sustainable, all produce sold commercially within the community must meet the following criteria:

    a. USDA Certification.

    b. Must be sourced within 60 miles of the community.

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FARM TO TABLE (CONTINUED)

PART 4: HUMANE AGRICULTURE [47]

All meat, egg, and dairy products sold or distributed on the premises by (or under contract with) the project owner meets the following criteria for the human treatment of livestock:

    a. Humane Certified labeling

    b. USDA Certified labeling

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HAND/FOOD CLEANING STATIONS

All living organisms contain bacteria that often end up on the many surfaces and objects we come into contact with each and every day.[48] Although a very small percentage of germ cells are considered to be harmful to the average person, those in a state of vulnerability are much more susceptible to infection and illness.[49] An illness that begins with a single person can become more powerful and spread rapidly throughout a community. However, the likelihood of spreading harmful bacteria to one another can be greatly reduced when good personal, household, and food hygiene is practiced.[50] Therefore, the following features are intended to promote good community hygiene practice and improve overall health and wellbeing.

PART 1: HAND+FOOD CLEANING STATIONS
To reduce the spreading of harmful bacteria from our hands and fresh fruits and vegetables, cleaning stations will be located:
    a. Within all designated community gardens to allow proper washing.
    b. Within 100 feet of areas abundant with edible landscaping.

PART 2: SANITIZATION
To provide added layer of protection from illness and the spreading of bacteria, the following will be provided:
    a. Sanitizing wipes within all physical activity spaces.
    b. Sanitization dispensers at the entrance of all community facilities and patio areas.

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PROCESSED FOODS

When looking at nutrition labels, we more often than not, see a long list of ingredients that are foreign to our eyes. This is largely due to the fact that most (70 percent) of the U.S. diet is made of highly processed and refined ingredients.[51] These types of ingredients can cause imbalances in our endocrine system and also increase the amount of gut microflora (bacteria), making food harder to break down.[52] Interestingly enough, 80 percent of process foods in America are banned in other countries due to their toxic and harmful effects.[53] Although many people have been aware of these ingredients, the spreading of awareness relating to their health effects have prompted individuals, families, and even public schools to ban them.

This health amenity is intended to reduce the amount of processed and refined ingredients through restrictions in addition to the integration of attractive healthy alternatives.

## PART 1: REFINED INGREDIENT RESTRICTIONS [54]
All food, beverages, snacks and meals sold or distributed in the community by (or under contract with) the project owner must meet the following conditions:
    a. No beverage with more than 30 g of sugar per container is sold or distributed through vending machines. Bulk containers of 1.9 L (2 quart) or larger are exempt from this requirement.
    b. In beverage vending machines and on food service menus, at least 50% of slots or listings are products that have 15 g or less of sugar per 240 mL [8 oz] serving.
    c. No individually sold, single-serving, non-beverage food item contains more than 25 g of sugar.
    d. In any foods that contain a grain flour, whole grain is the primary grain ingredient by weight.

PART 2: HEALTHY VENDING MACHINES
All vending machines located throughout the community must meet the conditions of Part 1 and offer the following:
    a. Fresh Fruit such as apples, oranges, and bananas.
    b. Fresh Vegetables such as carrot sticks and celery sticks.
    c. Raw Nuts such as cashews, almonds, and peanuts that are high in protein and omega-3 fatty acids.
    d. All-natural fruit or vegetable juices.
    e. Sodas made with Stevia.
    f. Health snacks such as cliff bars.

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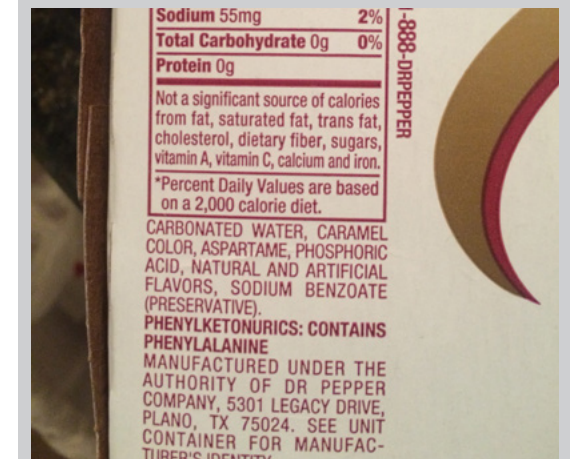
FOOD ADVERTISING

Whether on television, in website adds, radio commercials, social media or even strategically placed in movies, food advertising is a very effective strategy. However, much of the food advertising we are exposed to are for non-nutritious foods such as potato chips, soda, candy, or fast food. Research has found a strong connection between exposure to these types of advertisements and obesity.[55]

Limiting exposure to the advertising of unhealthy foods can help decrease the likelihood that individuals will make unhealthy eating choices.[56] Additionally, by providing access to information about nutrition, individuals can be empowered to be more aware of food discrepancies and develop healthier eating habits and diets.

This healthy eliminates the advertising of unhealthy foods, while promoting the advertising of better food choices such as fresh fruits and vegetables and low-calorie meals.

PART 1: ADVERTISING AND ENVIRONMENTAL CUES [57]
The following is met:
    a. Advertisements for any food or beverage items that do not conform to the Processed Foods Feature are not purposefully displayed on the premises.

PART 2: NUTRITIONAL MESSAGING [58]
Using prominent displays such as educational posters, brochures or other visual or written media, all designated eating areas contain at least 3 instances of messaging intended to achieve each of the following requirements:
    a. Encourages the consumption a. of whole, natural foods and cuisines.
    b. Discourages the consumption of sugary or processed foods, beverages and snacks.

MINDFUL EATING

According to the WELL Building Standard, eating in isolation during meals can contribute to stress and overeating.[59] Though some may prefer to eat alone during meals, many people eat alone simply because there are no communal eating areas that are easily accessible at their workplaces or in their communities.

Acknowledging the human need for nature and social interaction and the benefits they may have on our eating habits, this health amenity provides residents with dedicated areas for eating and socializing with others. The presence of these spaces can lead to healthier eating behavior, alleviate stress, and strengthen social interaction among the community.

PART 1: PATIOS AND PLAZAS
Outdoor eating spaces must adhere to the following requirements:
    a. An appropriate amount of outdoor eating space/s must be located within 100 feet of schools, businesses, and the health anchor.
    b. Outdoor eating space/s must incorporate some combination of shaded and unshaded areas for weather and sun protection.
    c. Outdoor eating spaces should include sanitizer dispensers, recycling bins, and disposal bins.

MIND

BACKGROUND

Whether good or bad, our bodies actively respond to our emotions. When disruption to our mental state occurs, symptoms such as high blood pressure, back pain, rapid weight gain or loss, health palpitations, and loss of appetite can poses threats to our wellbeing.[60] Because of the innate mind and body connection, a community design that is cognizant and supportive of our mental wellbeing can also provide many physical health benefits.

These health amenities are designed to put residents at ease with improved access to safety and natural forms of therapy, as well as features that can foster inspiration and intellectual growth.

PURPOSE

To integrate nature, technology, and safety strategies into our community to provide an environment that is aware of cognitive and emotional health.

HEALTH OUTCOMES

Potential health outcomes of MIND include improved:
- Mental Health
- Emotional Health
- Mood
- Energy
- Physiological Health
- Physical Health

BIOPHILIC DESIGN
1. Biophilia

KNOWLEDGE
1. Outdoor Learning
2. Outdoor Co-Working Spaces
3. Technology

INSPIRATION
1. Culture

SELF-MONITORING
1. Heart Monitor Stations
2. Community Heart Monitoring

SAFETY
1. Emergency Response
2. Night Lighting

NOISE REDUCTION
1. Green Buffers

WILDLIFE PRESERVATION
1. Habitat Restoration
2. Land Preservation

■ = Standard Requirements (2)
■ = Optimizations (5)

BIOPHILIC DESIGN

As humans, we have an innate connection with our natural surroundings and other living organisms.[61] Research supports that this instinctive bond represents a psychological need to experience natural elements around us and interact with other living organisms.[62] Due to this, exposure to nature is known to have profound health benefits, as it can help to alleviate stress, enhance creative thought, and improve cognition.[63]

This health amenity acknowledges the importance of human to nature interaction by recognizing many of the patterns of biophilic design that were established in the book "14 Patterns of Biophilic Design".[64] The incorporation of the Nature in the Space Patterns of Biophilic Design can improve health outcomes such as stress reduction, improved cognitive function, and enhancement of creative thought.

PART 1: BIOPHILIA [65]
To address enhance the presence of nature and its health benefits to the community, the seven biophilic design patterns of "Nature in the Space" category of biophilic design must be represented:

    a. Visual Connection with Nature.

    b. Non-Visual Connection with Nature. This pattern refers to auditory,

    c. Non-Rhythmic Sensory Stimuli

    d. Thermal & Airflow Variability

    e. Presence of Water. This pattern is intended to activate the senses.

    f. Dynamic & Diffuse Light

    g. Connection with Natural System

KNOWLEDGE

According to the U.S. Environmental Protection Agency, the average American only spends 7 percent of their entire life outdoors, meaning that the other 93 percent is spent in either an automobile or indoors where the concentration of pollutants are often much higher.[66] This is likely due to the lack of resources that are available for us to engage in the same activities outdoor that we do in indoors, such as work or school. Nonetheless, recent studies have shown that taking work or school outdoors can provide many profound benefits, such as cognitive and social development in children and increased productivity in adults.[67]

This health amenity promotes a healthy and enlightening environment that allows residents to do their work in the comfort of the outdoors.

PART 1: OUTDOOR LEARNING
Growing evidence supports that oudoor education can improve mental strength and promote physical, emotional, and spiritual well-being.[68] Therefore, the following feature will be provided:

    a. An outdoor classroom or learning pavillion large enough to accomodate 100 people for outdoor lectures or discussion. If a school is located within the community, this feature must be located within a 5 minute walk of the school. If there is not a school, this feature should be located within a 5 minute walk of the Health Anchor.

PART 2: CO-WORKING STATIONS
Like outdoor learning spaces, outdoor work stations hold many health benefits and can help to increase productivity.[69] A combination of covered and uncovered work stations must be located near the Health Anchor, local businesses or commercial areas, parks, or nature areas, and include:

    a. Electrical outlets and high-speed internet access to encourage residents to bring their work outdoors.

    b. Adequate shading to help reduce glares on computer screens.

    c. Adequate landscaping buffers to block wind and provide privacy for meetings.

PART 3: TECHNOLOGY INTEGRATION
All outdoor community amenities including parks, patios, fitness areas, and community gardens will be supported by:

    a. Wireless Internet to help residents stay connected.

    b. Community Mobile Phone application or website to connect residents to enhance health amenities, provide resources, and promote networking opportunities.

INSPIRATION

Defined as "*the achievement of one's full potential through creativity, independence, spontaneity, and a grasp of the real world*", self-actualization can positively influence our emotional and mental wellbeing by providing us with a sense of purpose and belonging.[70] A community that promotes its talent within can help people feed people with inspiration and further build community identity and synergy.

Engagement in music and visual arts can be a therapuetic experience enhancing one's mood, emotions, and self awareness.[71] Simply observing others engaging in various forms of art could provide the same therapeutic experience and health benefits.

PART 1: CELEBRATION OF CULTURE

Research studies have found a connection between engagement in cultural activities and health.[63] Culture is said to provide us with satisfaction with life and stress reduction.[72] Therefore, to celebrate the health benefits of culture, at least two of following should be offered:

- a. Promotion of art through display of local art in community facilities.
- b. An annual Art Fair for all ages to showcase local talent.
- c. An outdoor ampitheater appropriate to the scale of the community.
- d. An indoor or covered outdoor studio space for fine arts.
- e. Art, Music, or Dance classes based on the amount of community interest.
- f. Community Talent Show.
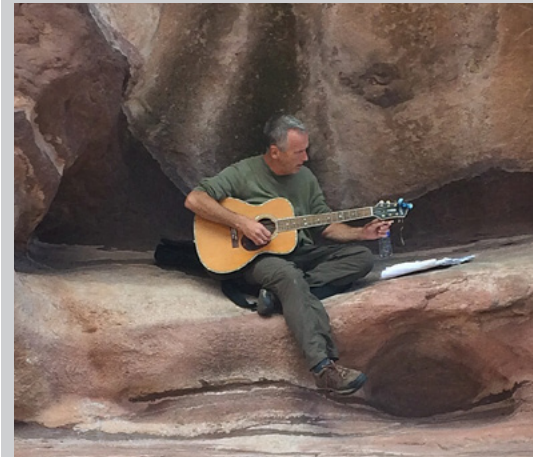
SAFETY

The safety of a community can play a major role in the wellbeing of its residents. In fact, safety is often recognized as a community health issue with research showing direct correlations between safety and health outcomes.[73] If a community is perceived as unsafe, it is less likely that people would want to spend any time outdoors, which could result in negative health outcomes.

By establishing a higher level of safety, residents can enjoy the community's health features at ease. The following features establish a strategies protocols designed to improve community safety and the overall wellbeing of residents.

PART 1: EMERGENCY RESPONSE SYSTEM

To provide residents with quick response to emergency situations, the follow system will be implemented:

- a. A number of security guards appropriate to the size and population of the community to watch for suspicious activity, send security alerts, respond to emergencies, and notify local police if necessary.
- b. Illuminated Emergency Phone Kiosks stationed throughout the community for residents to use in a state of emergency. Use of the kiosk can activate a siren, while simultaneously sending an alert to security staff and local police. Kiosks must also have an emergency first-aid kit.
- c. Text Message Alerts that notify residents of any community threats or dangeous weather conditions.

PART 2: NIGHT LIGHTING

To give residents a clear and distant range of view at night, the following features are offered:

- a. Nightlighting along all sidewalks and trails.
- b. Nightlighting for all community spaces and bike rack areas.
- c. All courts, fields, recreational spaces.
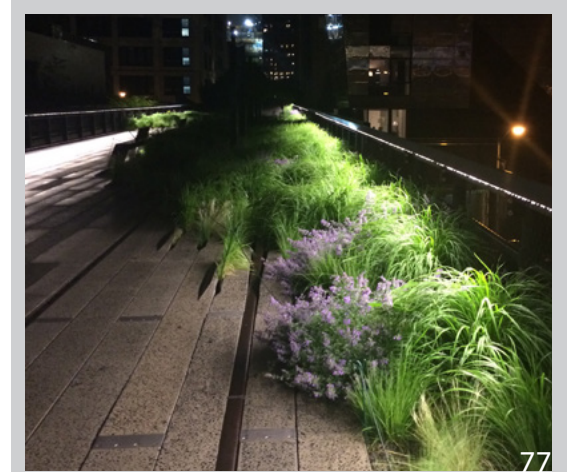
SELF-MONITORING

At the intersection of advanced technology and mobility has come a variety of new gadgets that can enable us to be more informed and attentive to our personal health. By having access to these types of resources, people can be more accurately aware of their health status and gain regular insight that can be a motivator for engaging in more physical activity.

This health amenity requires the promotion and offering of a self-monitoring devices, so that residents can accurately measure and track fitness goals, as well as track biomarkers such as heart rate variability.[74]

PART 1: HEALTH MONITOR STATIONS
To allow residents to monitor their pulse rate during or after engaging in physical activity, pulse/ heart rate monitor stations must be located:
- a. At the beginning/end of all trail loops.
- b. Within 50 feet of large outdoor exercise spaces.
- c. Inside of the Health Anchor.

PART 2: COMMUNITY HEART MONITORING
To encourage people to set hard goals and track their fitness training and results, HeartCloud offers an online platform that enables people to share their data with others to support pro-active teamwork and empower behavior changes.[75] Therefore mobile self-monitoring devices with HeartCloud will be promoted in the following ways:
- a. Full-time Fitness/Personal trainers will each have a self-monitoring device.
- b. Fitness/Personal trainers will provide demonstrations on how to use self-monitoring devices and discuss the benefits.
- b. Self-monitoring devices with HeartCloud will be advertised near group fitness areas.

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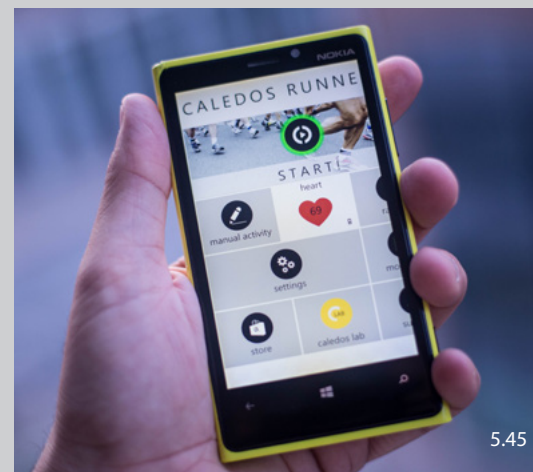
NOISE REDUCTION

As communities become more compact and dense, it is inevitable that sound levels in some areas will elevate. Increased noise can cause sleep disturbance, hyptertension, cardiovascular, and even psychophysiological effects.[76] Although it often takes high levels of noise to cause these kind of health effects, it is important to maintain an appropriate level for residents to feel comfortable when at home or in their community spaces. One common and effective method that has been used to minimize noise is landscaping. In fact, the Georgia Forestry Commission states that planned efforts of reducing noise to green buffers can help to reduce noise levels by as much as 50 percent to the human ear (5 to 8 decibels per 100 feet of buffer width).[77] Noise reducing landscape can help to improve the mental and physical health of residents, while providing other benefits such as aesthetic appeal.

This health amenity creates a quieter and more peaceful outdoor environment through the integration of sound reducing landscaping.

PART 1: GREEN BUFFERS [78]
To reduce noise throughout the community, indigenous green buffers such as trees and shrubs must be used and adhere the the following requirements:
- a. Green buffers must be planted in closer proximity to the source of noise rather than the effected area.
- b. For roads with heavy vehicle traffic, 65 to 100 feet wide "tree-belts" should be used to create a natural noise barrier for residential areas. For moderate speed roads, these buffers must be 20 to 50 feet wide.
- c. Dense barrier shrubs should be planted around the parameter of co-working spaces and outdoor learning spaces.
- d. Amphitheater space must be surrounding by green buffers that are a minimum of 10 feet in width.

WILDLIFE PRESERVATION

As cities continue to sprawl outward to accommodate human demands, it often comes at the cost of native wildlife and habitat. With U.S. forest land the size of Pennsylvania estimated to be consumed by 2050, many areas are becoming too small to sustain native species and biodiversity.[79] Though the benefits may not always be visible or appreciated, humans depend on biodiversity, as it carries many important benefits to health research and traditional medicine.[80] In fact, traditional medicine developed through research of our plants, animals, and microbes are estimated to be used by 60 percent of the worlds population.[81] Therefore, continued activities such as overfishing and habitat loss not only causes disruption to our ecosystem, but can limit the human ability to further understand physiology and discover new health treatments for diseases.[82] As designers of the built environment, we must not try to overcome nature, but rather learn how we can use it to make humans, animals, and plants healthier.

By recognizing the importance of wildlife and bioversity, this health amenity requires that communities implement design solutions that can help to restore habitat, improve human health, and ultimately foster a harmonious relationship between humanity and other living organisms. As designers of the built environment, we must also be aware of the needs of animals.

PART 1: HABITAT RESTORATION [83]

To create habitat that is sufficient for sustaining wildlife and biodiversity, the following elements must be provided for native species throughout the community or in a preserved space:

    a. Food.

    b. Water through the integration of birdbaths and small ponds.

    c. Cover in the form of trees and shrubs for nesting, protection, and shelter from weather.

PART 2: LAND PRESERVATION

For New Construction projects, at least 30 percent of community space should be alloted for the following:

    a. Wildlife and Nature Preservation areas.

    b. Ponds, Lakes, or Streams for the enjoyment of residents and wildlife.

    c. Natural streams.

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AIR

BACKGROUND

Despite on-going efforts to reduce our carbon footprint, nearly half of the United States population currently lives in areas that do not meet government air quality standards.[84] Considering that air is one of the most fundamental determinants of health, air pollution continues to pose a very serious threat to our wellbeing. At the local, regional, and global scales, air pollution has been linked to myriad of negative health outcomes ranging from respiratory disease and birth defects, to cardiac arrhythmia and premature mortality.[85]

Nonetheless, the spreading of awareness and adoption of air quality standards at the local level can improve the quality of air that we breathe and work to prevent noncommunicable diseases. Design strategies in communities can be an effective way to improve the local air quality, by influencing our behaviors and making people more conscious of the adverse health effects that come as a result of our lifestyles.

INTENT

WELL Communities establish requirements that help to reduce pollution and support the health and well-being of community residents.

HEALTH OUTCOMES

Potential health outcomes of AIR include improved:
- Breathing
- Respiratory Health
- Immune System

■ COMMUNITY SMOKING BAN
1. Community Smoking Ban

■ AIR POLLUTION MONTORING + DISPLAY
1. Air Pollution Sensors
2. Real-Time Air Pollution Display

■ ARBORETUM
1. Tree Variety and Promotion
2. Arbor Day Observation

■ AUTOMOBILE REDUCTION
1. Parking Reduction
2. Carpooling

■ SOLID WASTE MANAGEMENT
1. Waste Collection System
2. Recycling and Composting

■ = Standard Requirements (1)
■ = Optimizations (4)

COMMUNITY SMOKING BAN

According to the World Health Organization, tobacco kills 5.4 million people per year worldwide—equating to an average of one person every six seconds.[86] Although tobacco use is decreasing in America, it is still linked to nearly 500,000 American deaths from various types of cancer and diseases.[87] Non-smokers who are exposed to secondhand smoke from tobacco are also subject to the same health risks as smokers, which has prompted some communities to prohibit smoking in public places.

Many studies have shown implementation of smoke-free policies has led to many improvements in health outcomes, such as reductions in respiratory disease, coronary and cerebrovascular events, and heart-related hospital admissions.[88] Therefore, this health amenity follows the WELL Building Standard's requirement for the implementation of a smoking ban along with signage that educates residents about the harmful effects of smoking tobacco.

PART 1: COMMUNITY SMOKING BAN
To reduce the use of tobacco, the community smoking ban entails:
    a. The prohibiting of all indoor and outdoor smoking or use of e-cigarettes within the community's boundaries; with the exception of inside privately owned residences.
    b. The placement of signage including "Smoke-Free Community" labeling with a one-line description of the policy and a one-line description of the hazards of smoking to send a informative message to smokers.
    c. A fine given to people for smoking in prohibited areas. The fine amount should be decided by the project owners and or managers.
    d. The donating of proceeds from smoking fines to the American Lung Association.

SMOKE-FREE CAMPUS

SMOKING IS NOT PERMITTED ON THIS CAMPUS. THIS INCLUDES ALL BUILDINGS, PARKING GARAGES, AND GROUNDS.

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AIR POLLUTION MONITORING + DISPLAY

Air quality can be highly variable with factors like geographical location, climate, density, industry makeup, and traffic patterns presenting problems that are very unique to each community. Due to technological advancements, there are now air pollution sensors available in the marketplace, that when networked together, can measure a variety of outdoor air pollutants across a given area.[89] By providing pollutant readings in real time, these sensors can provide insight into the spatial and temporal patterns of pollutants.[90]

This health amenity empowers residents to gain a clearer understanding of the levels of air pollution that they are being exposed to in their community through air pollution sensors and displays. By seeing the air pollution in real time, residents can also understand what is putting them at risk, which could possibly help influencing behavior and ultimately improve health outcomes.

PART 1: AIR POLLUTION SENSORS
To comprehensively measure the air quality of the community, the following is required:
    a. The installation of multiple air pollution sensors appropriate to the nature and scale of the community.
    b. The air pollution sensors must be connected within a network to provide a clearer understanding of pollution levels and concentraions.
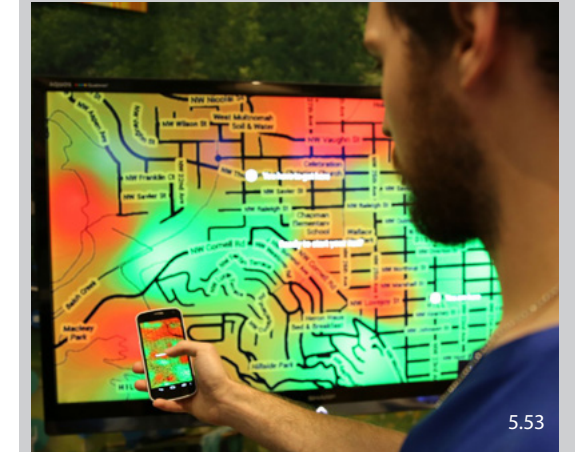
PART 2: REAL-TIME AIR POLLUTION DISPLAY
To provide residents with real-time readings, the following will be installed:
    a. A real-time visual display of local air pollution.
    b. Must be located in the health anchor.
    c. Digitally accessible via community website or mobile app.[91]

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5.53

Air Pollution Monitoring Station

5.54

ARBORETUM

Did you know that two mature trees can provide enough oxygen to support a family of four?[92] In fact, one tree can produce over 200 pounds of oxygen in a single year.[93] By also absorbing carbon dioxide and other potentially harmful gasses, trees not only provide us with air to breathe, but help to clean our air, making them a very vital part of our health and ecosystem.[94]

Trees are commonly known to provide many other benefits to communities such as water and energy conservation, shade, higher home values, and improved quality of life which can increase the desirability of a community or neighborhood.[95]

This health amenity promotes cleaner air through Arboretums, which are designated areas or places where trees are cultivated for recreational, spiritual, educational, or scientific uses. In Well Communities, arboretums are intended to foster the celebration of trees and their health benefits, while establishing or strengthening emotional connections between people and nature. This amenity requires the designation and improvement of green space or an existing woodland or forest as an arboretum in addition to the following parts.

PART 1: TREE VARIETY AND PROMOTION
To provide visitors or residents with a more engaging experience, the following is required:
    a. There must be at least 10 different indigenous species of trees.
    b. Trees must be identifiable through either a tree guide or signage including a brief description of the health benefits of trees, or "fun facts".

PART 2: ARBOR DAY OBSERVATION
The following holiday will be observed to improve air quality, strengthen inter-generational family bonds and connections with nature.
    a. Arbor Day (Final Friday of April), which is dedicated each year to planting trees.

AUTOMOBILE REDUCTION

As a result of more than half a century of rapid urban and suburbanization, the automobile has become the single greatest air polluter in the United States.[96] This not only is an environmental concern, but a public health concern considering that the emissions from our automobiles directly expose us to harmful exhaust pollutants such as nitrogen oxide and carbon minoxide.[97] Some of the conditions from these pollutants can become so hazardous at times that cities issue warnings for people to stay indoors. Needless to say, our health can benefit greatly from the reduction of automobiles. Although there are many environmental and personal health benefits of automobile reduction, automobiles are still a big part of our everyday culture and are are an absolute necessity for many people to get places. Therefore, it is important for communities should take a pragmatic approach to reducing the use of automobiles.

This health amenity is intended to improve the quality of air and ultimately the overall health of community residents through design strategies, resources, and policies that can help reduce our carbon footprint.

PART 1: PARKING REDUCTION
To increase physical activity and minimize the adverse effects of automobiles and large parking lots, the following must be followed for New Construction projects:
    a. All surface parking lots should be placed away from the street at either the side or rear of buildings.
    b. No more than 20 percent of the total land area of the community should be used for surface parking with no individual parking lot being larger than 2 acres in size.[98]
    c. Existing communities should evaluate their ability to reduce parking stalls and either replace them with bicycle storage or pocket green spaces.

PART 2: CARPOOLING
If a community does not have nearby transit options, then carpooling opportunities should be offered for residents through the following:
    a. Conducting a voluntary carpooling survey of the areas in which residents commute to for work.
    b. Grouping names and contact information by employment area.
    c. Sending participating residents a list of residents in their employment area.
    d. 10 percent of total automobile parking spaces for non-residential buildings should be designated for carpool or shared-use vehicles with appropriate signage.[99]

SOLID WASTE MANAGEMENT

Despite widespread efforts to reuse and recycle, solid waste continues to be a major problem posing negative effects on our air quality by polluting it with emissions of particulate matter, odor, leachate seepage, and greenhouse gases that can increase our risk our health risks.[100] With increased risk of cancer, birth defects, nervous system damage, and asthma, it is critical for communities to develop more sustainable means of disposing of waste.[101]

This health amenity is intended to protect the community's right to clean air by reducing the air pollution caused by solid waste disposal and management and requires plan implementation, encouraging recycling, composting, and use of emerging waste management practices.

PART 1: WASTE COLLECTION
To reduce the amount of air pollution that caused is caused by waste disposal and collection, one of the following systems must be implemented into the design of the community:
    a. An automated vacuum waste collection system, also know as a pneumatic waste collection system, with indoor and outdoor collection points.[102] The waste collected through this system must then be divided and managed on-site (New Construction only).

PART 2: RECYCLING AND COMPOSTING
To further reduce waste disposal, recycling efforts will be improved through the following:
    a. There must be dedicated infrastructure for the collection of recyclables and compostable food scraps.
    b. On-site compost facility to accommodate the community's food scraps
    c. Electronic goods recycling.

WATER

BACKGROUND

Water is an imperative resource for the survival of humans and all other living organisms. Considering that more than half (60 percent) of the adult body weight is water, humans would not be able to survive very long without it.[103] Water helps us with digestion, body temperature regulation, cell reproduction, energy, and neurological functions among many other benefits.[104] However, many public water supplies are exposed to biological, chemical, and mineral contaminants that can go undetected, meaning that even water that is clean by government standards, may still contain elements that are harmful to our health.[105]

PURPOSE

To achieve optimal water quality and usage throughout the community using innovative design and treatment strategies.

HEALTH OUTCOMES

Potential health outcomes of WATER include improved:
- Physiological Health
- Cardiovascular Health
- Nervous System
- Digestive System

■ **FUNDAMENTAL WATER QUALITY**
1. Sediment
2. Microrganisms
3. Quarterly Testing
4. Water Data Recordkeeping and Response

■ **CONTAMINANT REDUCTION**
1. Dissolved Metals
2. Organic Pollutants
3. Herbicides and Pesticides
4. Fertilizers

■ **PUBLIC WATER ADDITIVES**
1. Disinfectants
2. Disinfectant Byproducts
3. Flouride

■ **PERIODIC WATER QUALITY TESTING**
1. Quarterly Testing
2. Water Data Recordkeeping and Response

■ **NATURAL FILTRATION SYSTEMS**
1. Bio-filtration Planters
2. Bioswales / Rain Gardens

■ **DRINKING WATER PROMOTION**
1. Drinking Water Access
3. Water Dispenser Maintenance

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■ = Standard Requirements (3)
■ = Optimizations (3)

FUNDAMENTAL WATER QUALITY

Inadequate attention or negligence to water quality can allow hazardous chemicals and pathogens enter our water supply.[106] Therefore, measuring the water quality is a critical and necessary process for ensuring that the community's water is at an appropriate level for healthy consumption.[107] According to the WELL Building Standard, simple criteria can be used to measure and indicate an acceptable and safe water quality level.[108]

The parts of this health amenity were carried over from the Fundamental Water Quality feature established in WELL Building Standard to maintain consistency with the WELL Building Standard's water safety levels.[109] The following requires performance tests for coliform bacteria and turbidity, which the WELL Building Standard identifies as two measures that can help indicate if any harmful contaminants are present in the water.[110]

PART 1: SEDIMENT [111]

A sample of all water being delivered to the project area for human consumption meets the following minimum requirement during the WELL performance audit:

      a. Turbidity of the water sample is less than 0.3 NTU.

PART 2: MICROORGANISMS [112]

A sample of all water being delivered to the project area for human consumption meets the following requirement during the WELL performance audit:

      a. Total coliforms (including E. coli) are not detected in the sample.

PART 3: QUARTERLY TESTING [113]

Water from all community faucets and drinking fountains is tested quarterly for the presence of the following dissolved metals or metalloids.

      a. Lead.
      b. Arsenic.
      c. Mercury.
      d. Nickel.
      e. Copper.

PART 4: WATER DATA RECORD KEEPING AND RESPONSE[114]

Projects provide a written policy specifying:

a. Detailed enforcement strategies for monitoring and keeping record of water quality parameters listed in the WELL Building Standard.

b. Records be kept for a minimum of 3 years, including full data from field inspectors or laboratory results where appropriate.

CONTAMINANT REDUCTION

From dissolved metals and pharmaceutical products to herbicides and fertilizers, there are many contaminants that manage to go undetected throughout water treatment processes.[115] In fact, the Environmental Working Group reported that between 2004 and 2009, U.S. water suppliers found more than 300 contaminants in water supplied to the public--most of which were industrial contaminants from factory discharges and various consumer products, such as deodorants, antibiotics and pain relievers.[116] These types of contaminants can pose serious threats to our health, as they can increase the risk of cancer and are linked to neurological, kidney, and gastrointestinal damage among many other adverse health effects.[117] Through the usage of various filters and systems, these contaminants can be reduced, as well as the health risks that come with them.

The parts of this health amenity were carried over from the Inorganic Contaminants, Organic Contaminants, and Agricultural Contaminants features established in WELL Building Standard v1.0.[118] The following parts are to be followed to maintain consistency with the WELL Standard's

PART 1: DISSOLVED METALS [119]

Water from all community faucets and drinking fountains, if present, meets the following requirements:

      a. Lead less than 0.01 mg/L
      b. Arsenic less than 0.01 mg/L
      c. Antimony less than 0.006 mg/L
      d. Mercury less than 0.002 mg/L
      e. Nickel less than 0.012 mg/L
      f. Copper less than 1.0 mg/L

PART 2: ORGANIC POLLUTANTS [120]

Water from all community faucets and drinking fountains, if present, meets the following requirements:

      a. Styrene less than 0.0005 mg/L.
      b. Benzene less than 0.001 mg/L.
      c. Ethylbenzene less than 0.3 mg/L.
      d. Polychlorinated biphenols less than 0.0005 mg/L.
      e. Vinyl Chloride less than 0.002 mg/L.
      f. Toluene less than 0.15 mg/L.
      g. Xylenes (Total: m, p and o) less than 0.5 mg/L.
      h. Tetrachloroethylene less than 0.005 mg/L.

CONTAMINANT REDUCTION (CONTINUED)

PART 3: HERBICIDES AND PESTICIDES [121]

Water from all community faucets and drinking fountains, if present, meets the following requirements:

    a. Atrazine less than 0.001 mg/L.

    b. Simazine less than 0.002 mg/L.

    c. Glyphosate less than 0.70 mg/L.

    d. 2,4-Dichlorophenoxyacetic Acid less than 0.07 mg/L.

PART 4: FERTILIZERS [122]

Water from all community faucets and drinking fountains, if present, meets the following requirements:

    a. Nitrates as N less than 10mg/L

PUBLIC WATER ADDITIVES

Not all chemicals in our public water supply are there unintentionally. In fact, small amounts of chemicals such as chlorine, chloramine, and fluoride are added throughout water treatment processes in the United States to disinfect our water and to prevent tooth decay.[123] Like many things, however, moderation is key. Studies have shown that excessive exposure to these types of chemicals can increase our risk of cancer and other adverse health effects.[124] Acknowledging that some areas have excessive amounts of disinfectant byproducts in their water supply, it is necessary to establish and maintain an appropriate and safe level.

The parts of this health amenity were carried over from the Public Water Additives feature of the WELL Building Standard to maintain consistency with their established water requirements and techniques. The WELL Building Standard requires the "use of reverse osmosis systems and activated charcoal filters to remove harmful byproducts like trihalomethanes (THM's) from water sources while maintaining appropriate levels of chlorine, chloramine, and fluoride",[125] Reverse osmosis systems work to reduce the number toxic chemicals by forcing water across a membrane from a concentrated state to a more diluted state.[126] Activated Charcoal Filters are affordable ways to clean water, as they can absorb and retain a variety of chemicals.[127]

PART 1: DISINFECTANTS [128]

Water from community faucets, drinking fountains, and showers meets the following requirements:

    a. Residual Chlorine less than 0.6 mg/L

    b. Residual Chloramine less than 4mg/L

PART 1: DISINFECTANT BYPRODUCTS [129]

Water from community faucets, drinking fountains, and showers meets the following requirements:

    a. Total Trihalomethanes less than 0.08 mg/L.

    b. Total Haloacetic Acids less than 0.06 mg/L.

PART 1: FLOURIDE [130]

Water from community faucets and drinking fountains meets the following requirements:

    a. Flouride less than 1.5 mg/L

NATURAL FILTRATION SYSTEMS

As a result of urbanization, there are many regions that suffer from water scarcity and contamination. With increased street traffic, streets can collect a significant amount of dangerous toxins that are carried into our water systems, increasing the risk of waterborne illnesses which has contributes to thousands of health outbreaks each year.[131] Many communities have addressed these issues with natural solutions, such as bioswales, rain gardens, and biofiltration planters that can treat storm water and also help to reduce the risk for flooding.[132]

This health amenity provides a natural form of treatment for our water systems and also adds to the aesthetic appeal of the community.

PART 1: NATURAL FILTRATION SYSTEMS

To provide a sustainable, ecological, and healthy solution for maintaining fundamental water quality, the following are required for New Construction proejcts:

    a. 100 percent of stormwater discharge must be managed on-site to feed the internal demands of community facilities and amenities or the discharge or released for vegetation.[133]

    b. Some combination of bioswales, rain gardens, or bio-filtration planters must be integrated throughout the community to add aesthetic appeal and provide a natura form of water treatment by filtering out water contaminants.

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DRINKING WATER PROMOTION

Improving resident's access to clean and attractive drinking water sources, such as filling stations and drinking fountains, can promote healthy hydration and also prevent many adverse health effects. Evidence has also shown that promoting the consumption of water can help reduce unhealthy weight gain and obesity.[134]

There are also many benefits of tap water over bottled water, despite the common perception that bottled water is healthier. Chilled water, carbonated water, or water with fresh fruit in community facilities. Near community trails. Close proximity to schools and at appropriate height.

PART 1: DRINKING WATER ACCESS

To encourage water consumption, a combination of drinking fountains and water bottle filling stations will be located throughout the community under the following requirements:

    a. There must be a drinking fountain/water bottle filling station located at each mile marker of community fitness trails.

    b. Drinking fountains must be located within 25 feet of all outdoor exercise spaces and parks.

    c. Drinking fountains must be placed along high traffic sidewalks.

PART 2: WATER DISPENSER MAINTENANCE[135]

The components of the water dispenser that provide drinking water are cleaned with the following regularity:

    a. Daily, for mouthpieces, protective guards, and collective basins, to prevent lime and calcium buildup.

    b. Quarterly, for outlet screens and aerators, to remove debris and sediment.

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CONCLUDING REMARKS

DISCUSSION

This research project set out to explore the WELL Building Standard to determine how it could be adapted to assist in planning and designing healthier communities. By basing the study around the health concepts established in the WELL Building Standard, I was not only able to reimagine the standard as a measurement for community health, but I was able to do so in a pragmatic way by identifying several preventable community health issues and connecting them to common and emerging practices that are used in the planning field today.

Throughout this study, I found the accessibility of literature to be an indicator of which concepts, features (health amenities), and parts might be most effective in improving specific health outcomes for a master-planned community. I also found it to be an indicator of which public health issues were more pressing than others. Fitness and Nourishment, for example were the most daunting concepts due to a vast amount of community health issues that are related to them. However, due to the large amount of literature that was available to me regarding these issues, there were many studies showing how they could be addressed through design strategies and policies.

Whether it was drawing connections between planning and health issues or determining how specific design strategies could achieve specific health outcomes, this research project represents a comprehensive examination of the ways in which community planning can influence changes in human health behavior and habits, which in return can influence the way planners and designers think about communities.

COMPARISON TO EXISTING GREEN BUILDING STANDARDS

When compared to the pre-eminent neighborhood standards such as LEED for Neighborhood Development and BREEAM Communities, Well Communities is structured similarly to the two—covering several of the same concepts and topics. The certification processes for LEED-ND and BREEAM are similar to Well Communities, as well as their rating systems. However, rather than focusing predominantly on sustainability and the environment, Well Communities focuses solely on improving community health. By taking this

approach alongside the WELL Building Standard, Well Communities could potentially complement LEED or BREEAM or even be integrated into each other. In fact, a couple concepts from LEED-ND were included as requirements for Well Communities.

Making clear and concise connections between health issues, outcomes, and design strategies and presenting it in a visual document is what I believe sets this standard apart from the other existing green building standards. Though health connections in communities are briefly identified in other standards, they are not presented as comprehensively or engaging as the Well Communities conceptual standard. The other building standards that exist today are geared very specifically toward professionals in the industry, which can make it intimidating for some people. When developing this standard, I wanted to present it in a way that not only building and design professionals would understand, but also any community member interested in improving their personal health or advocating health concepts in their community.

Perhaps, a standard similar to the one presented in this study could help planners to better market unfamiliar design strategies to community residents and stakeholders by being able to show how each can be of benefit to their health. A standard or certification system similar to this one might be a necessary approach to provide more incentive for planning healthier communities. However, with increased health awareness, these changes could be inevitable as people will continue to pursue more active and healthy lifestyles.

RECOMMENDATIONS FOR FUTURE RESEARCH

As with any new concept, the first step after developing it should involve a testing phase. For this conceptual standard in particular, testing of the concept would be performed on all aspects of the standard including the certification process, the rating system, and the health amenities. This could be introduced in a similar fashion as the WELL Building Standard, which involved a pilot program. By selecting a small amount of pilot projects, different types of communities could be included to understand its strengths and weaknesses, which could help to further develop and improve the

model, in addition to learning how the standard could be adapted to other community types. A testing phase or pilot program could also provide an opportunity to gauge how the industry responds to it and help in developing a plan for advocating it.

A standard of this nature should be an evolving document that adapts to the changes in health needs and also to different community types. Though much of my literature reflects public health issues in the developed world and more specifically, the United States, urbanization is a global phenomenon that holds perpetual health effects on human society. Acknowledging that health needs of countries and regions can be vastly different from one another, future research should not only identify ways to address different community types in the developed world, but also ways to make these design concepts more accessible for developing and underdeveloped countries. Therefore, the costs of these design strategies and how to make them more affordable is another avenue of possible future research.

Nonetheless, any further research and development of planning specific to improving health outcomes should involve collaboration across the design professions and among engaged citizens, medical practitioners, engineers, city officials, and real estate developers. Without extensive collaboration among all of these stakeholders, the needs of a community could become convoluted and favor one's interest over another.

ANALYSIS OF ALTERNATIVES

Despite a relatively short timeline, this research project was particularly successful in its ability to synthesize a wealth of literature and organize it into a simple mechanism for measuring the health awareness of a community. However, some of the methods and outcomes could have been performed differently to create a more stringent standard. First and foremost, a weighted method for the rating system could better account for wellness concepts, health amenities, or parts that hold more substantial health impacts or require more planning and committment to community health. For example, a requirement for providing health physicians within a masterplanned community would certainly hold more value than a requirement to provide

edible landscaping. This alternative would likely require a complete overhaul of the way that everything is evaluated and could potentially shape the project differently.

Secondly, the research project could have incorporated a better way to measure collectively measure the community's performance across all of the wellness concepts. Perhaps a perioidic community happiness survey, health index survey, or similar survey is the best way to determine how the community and its health amenities are performing overall. Considering that the health amenities are designed for the benefit of residents, surveys might be the most low-cost way of obtaining adequate insight into the performance. Lastly, an outcome that could have been different is a document that is more illustrative and technical in nature for various professionals to better understand how it applies to them.

FINAL THOUGHTS

Using a building standard to help create a community planning and design standard resulted in constant change throughout all phases of the research project. In fact, many of the changes did not occur until later in the process. Constant change was largely due to the depth of public health issues and also the depth of literature found as I developed each concept, feature, part, and requirement of the standard. Nonetheless, this project allowed me to aquire a deep understanding of how changes in the built environment can effect various aspects of health and also gave me insight into how powerful the planning profession can be in addressing public health issues.

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