"Nature Doesn't Pay My Bills:"

Mapping the Gaps Between Expert and Public Understandings of Urban Nature and Health

A FrameWorks Research Report on behalf of the TKF Foundation

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I. Introduction

This report is the first step in a larger collaboration with the TKF Foundation to develop a set of communications strategies and tools that can elevate public and policymaker support for making experiences of nature readily accessible to all residents of America's cities. Toward that end, the collaboration seeks to develop an evidence-based narrative that engages people in the value of designing, building, and maintaining accessible nearby nature spaces in cities to improve individual and community well-being. This communications effort builds off a foundational body of existing and still emerging research that documents and builds an evidence-base for the salutary power of nature in urban contexts.[1]

This first phase of the project, funded by the TKF Foundation, involves two tracks of research. The first identifies a shared scientific expert story—what FrameWorks calls an "untranslated expert story"—of the role that urban nature plays in human well-being. This story includes explanations of *how* and *why* nature facilitates well-being, as well as policy and programmatic directions that experts argue harness the connection between nature spaces and well-being to improve outcomes for individuals and urban communities. The second track of this research identifies the patterns of thinking that members of the American public use to reason about well-being, urban life, nature, and the intersections across these topics. Bringing these two research tracks together, this report identifies key communications challenges faced by experts and advocates as they seek to elevate support for nearby urban nature. The report also provides an initial set of strategic recommendations for how best to communicate the expert story in ways that expand public understandings of the connections between nature and well-being and build support for policies and programs that leverage this connection.

The research on public understandings presented here is distinct from other public opinion research that documents *what* people say by conducting polls or focus groups. The research described here documents *how people think*, and parses out the assumptions and thought processes that inform what people say, and how they form judgments and opinions. This cultural-cognitive approach is powerful because identifying *ways of thinking* is key to developing more effective and strategic communications. By understanding the various ways that people are (and are not) able to think and reason about an issue, communicators can craft messages that avoid unproductive understandings, activate productive ones, and engender new ways of thinking that are better aligned with policy goals. In short, an understanding of *how* people think is a powerful tool in identifying the specific ideas that require reframing and in designing effective translation strategies.

As all people have experiences with nature, and most with cities, it is not surprising that the public brings a powerful set of cultural models[2]—implicit and largely shared understandings, assumptions and patterns of reasoning—to thinking about these topics. Importantly, this research shows that while there are significant aspects of public understanding that overlap with the expert story, there are also many features that are not aligned with expert understandings and that likely impede efforts to elevate support for nearby urban nature. These dominant but unproductive ways of thinking include a deep pattern of thinking about cities and nature as mutually exclusive and even antithetical domains; an assumption that nature is a *nice* but not

necessary feature of urban spaces; and a strong model of "escape" to nature outside of, but not within, cities.

In describing these and other cultural models, this report provides a detailed understanding of the patterns of public thinking those communicating about nearby urban nature are up against, as well as a set of research-based recommendations to inform future communications in this field. In documenting expert and public perspectives, and enumerating the places where these views both converge and diverge, we begin to chart a course for a communications strategy that can be used to help people think more productively about the importance of designing and maintaining urban nature.

In further collaborations with the TKF Foundation, FrameWorks hopes to build on the descriptive research presented here by designing and testing communications strategies for reframing public discourse and understanding about the importance of nearby urban nature, addressing such themes as: why nearby nature in cities is important; how experiences with nature in cities improves human well-being; and what specifically needs to be done so that individuals and communities can benefit from such experiences. The ultimate goal of this larger project is to help people understand that nature is indispensible to human well-being—a necessary, not just "nice," feature of city life—and thereby increase public support for the policies and funding that can make nature's benefits accessible to residents in every city neighborhood across this country.

II. Executive Summary

The Expert View of Nearby Urban Nature

The following points constitute the central features of what experts on nearby nature in cities wish to be able to communicate to members of the public.

Why Does Nearby Urban Nature Matter?

Experts explain that human evolution is grounded in nature and that the experience of nature is integral to human psychological, emotional, and physical well-being. In contrast, cities are a recent invention that contribute to a range of negative health outcomes. As such, experts argue that providing access to nearby nature in cities is integral to supporting individual and public health. This need is made more pressing because of increased urbanization and disparities in access to urban nature across socioeconomic status. Experts argue that the positive effects of expanding access result in savings across other social services.

How Does Nature Improve Human Well-being?

Experts explain that time in nature provides a powerful respite from the stresses of city living. This rejuvenates people's mental capacity and provides a form of neurological rest, with positive effects on people's learning capacity and overall sense of agency. It also activates the parasympathetic system, which strengthens the immune system and facilitates recovery from stressful experiences. Experts argue that shared access to nearby urban nature builds social ties that reduce interpersonal conflicts and strengthen community engagement, collective action, and shared democratic life.

What Features of Nature Support Well-being?

Experts argue that the health benefits of experiencing nature extend across a spectrum from wild to tended forms of nature. In urban contexts, experts argue that nature's salutary effects can be enhanced by designing spaces with features that are pleasing to humans, including water, shade, sightlines, biodiversity, and safety. Experts often define nature by what it is not: for example, concrete, asphalt, and digital electronics. In contrast, nature is rounded, multi-textured, and emergent. Experts argue that regular exposure to nature is necessary in order for healthful effects to take root and be sustained.

How Can Nature Be Used to Improve Well-being in Cities?

Experts assert the need to strengthen our shared commitment to build a diversity of nature spaces in cities, with focused attention on neighborhoods with a deficit of well-maintained nature. They argue that the natural infrastructure in existing mass transit and park management systems must be protected and improved. They call for strategies to change professional discourse and practice within the architectural and urban planning fields, and to leverage those changes to shape urban policy and funding decisions. Experts also argue that school grounds and schedules should be structured to facilitate children's daily interactions with nature.

The Public View of Nature, Cities, and Health

The American public draws on a complex set of deep understandings, assumptions, and patterns of reasoning to make sense of the intersecting topics of nature, urban life, and human well-being. Chief among these are the following:

Individualism

The public thinks about *cities* as locations for personal employment and career advancement, and focuses on cost of living and personal safety challenges. They think about *health* as something determined by individual discipline in lifestyle, diet, and exercise, and urban *nature* as a location for individuals to exercise. Underlying this talk was an assumption that these topics matter because they shape individuals' capacity to advance personal life goals. These patterns make it challenging to frame urban nature as a matter of population health and public policy.

Consumerism

Public thinking is structured by an assumption that modern life is defined by relationships of production and consumption. Cities epitomize the marketplace of opportunities, entertainment, and consumables, and nature is deemed tertiary to this marketplace. Nature is also modeled as a consumable—a source of food for literal consumption and a location for human recreation and other uses. In positioning nature as tertiary to city life and as something to be consumed, this model devalues nearby urban nature as a location for respite and reflection.

Ideal vs. Real Fatalism

Americans are accustomed to distinguishing between *the way things are* and *the way they should be* and assume that the ideal is rarely achieved. This ideal/real contrast structures people's thinking about what a city *needs* in order to be a functional place, as opposed to what the "ideal" city might have. For most, nature in cities is an ideal, rather than a real necessity. This positioning of nature as a nice "add-on" to city life presents a fundamental challenge to the assertion that *all* city residents *need* to have access to nearby nature on a daily basis.

Modern Urban Life Is Unhealthy

The public assumes that modern life is inherently unhealthy—in terms of stress and work/life balance, exposure to toxins, experiences of community life, safety for children, and a range of other metrics. They apply this idea to modern *urban* life in particular, and view many of these problems as more concentrated in urban contexts. This thinking feeds a larger sense of fatalism about urban pathology and undermines a belief in our collective ability to improve it.

The World Is Man-made or Natural

The public is accustomed to thinking about the world as consisting of features that are either "man-made" or "natural." Within this contrast, cities serve as the prototype of the man-made, while "pure" wilderness epitomizes the natural. Thus, at a very deep cognitive level, cities and nature are opposed categories, and

nature is not understood as a necessary or intrinsic feature of urban landscapes. This underlying opposition presents a central challenge to efforts to reframe nature as fundamental to human well-being in urban contexts.

Nature Is Healthful

The public holds a strong underlying model of nature as salutary for people. This model is grounded in a sense that nature is our "roots" as a species and a source of sustenance for our survival. Beyond survival, spending time in nature is seen to be consistent with and supportive of human life and well-being more generally. This strong association between nature and health provides a critical starting point for communicating the expert story outlined above.

Need for Escape Away from Cities

The public has a model of nature as a location of respite from the stressors of modern life, but it is not dominantly applied to *urban* nature. Instead, people think about nature "out there"—away from cities, in national parks or wilderness areas—as the most powerful and true version of nature. This assumption presents a challenge to ascribing real salutary power to daily experiences of smaller patches of nature in urban contexts.

Cognitive "Holes"

Several features of the expert story are missing from public thinking. While the public understands that time in nature contributes to well-being, there is little understanding of the psychological, immune, and nervous system processes that underlie these effects. The public is also not attuned to disparities of access to urban nature, and how many poorer urban neighborhoods have fewer well-maintained green spaces. They are also not thinking about the broader benefits that accrue to communities when well-designed nearby urban nature is made readily available, and how those benefits translate into public savings. Finally, the public is not attuned to the design and *quality* of urban nature spaces, but rather assumes that *more* is better.

Gaps in Understanding

Comparing the expert story with the public's dominant understandings reveals a set of gaps in understanding. These gaps inhibit the public's ability to apply expert perspectives to think about nearby urban nature and represent key reframing targets. Notable gaps include:

1. ***Nearby Nature: Necessary vs. Ideal.*** While experts see nearby nature as necessary to human well-being and thus an essential feature of urban landscapes, the public sees nature as a nice, but not necessary, add-on to urban life.

2. ***Respite: Nearby vs. Far Away.*** While experts argue that even a small garden or grove can bring health benefits to people, the public thinks about nature on a grander scale, far removed from

cities, as that which provides respite from the stressors of modern urban life through its position as far away from daily life.

3. ***Mechanisms: Scientific Understandings vs. A Black Box.*** While experts speak to the specific immune, nervous, and cognitive benefits that come from experiencing nature, the public has little understanding of these underlying mechanisms, which undermines their valuing of urban nature and its contributions to well-being.

4. ***Scale of Outcomes*: *Public vs. Individual Health***. Experts think about the healthful effects of urban nature as a public health issue. Public thinking is focused on how nearby nature facilitates better lifestyle choices and health outcomes at the individual level.

5. ***Dosage: Daily vs. Highlight Experience.*** Experts argue for urban nature infrastructures that maximize daily exposure to nature to allow for the accumulation of health benefits. The public has a model of nature's power as a memorable highlight experience that sustains a person for another "round" of work and stress.

6. ***Disparity: Prevalent vs. Not on the Radar.*** Experts recognize that poorer urban neighborhoods often have fewer well-maintained green spaces available, which contributes to health disparities across communities. The public is not attuned to this disparity of access, nor to its broader health consequences.

7. ***Return on Investment: Substantial vs. Not on the Radar.*** While experts speak to the broader collective benefits and public savings—in health, public safety, and other services—that accrue when well-designed nature is made accessible in cities, the public is not attuned to the overall cost efficiency of upfront investments in nearby nature.

8. ***Solutions: Complex vs. Simple.*** Experts speak to a broad range of steps to enhance the healthful role of nature in cities—including attention to funding, urban planning, community engagement, and schools. The public largely defaults to the idea that "more parks and paths would be nice" and underestimates the scope and importance of the issue.

Central Communications Challenges

These gaps represent a set of challenges in engaging members of the American public in a productive conversation about the importance of nearby nature in cities. Future reframing work will need to focus on addressing the following challenges:

1. ***Escaping Away to Nature.*** The public view that it is nature "out there" that is restorative undermines the argument for devoting resources to nature within cities. Strategies need to be developed that harness the public's productive model of nature as healthful and help people situate it in urban contexts.

2. ***Active Urban Nature.*** The public's dominant model of urban nature is as locations for exercise and recreation—places to stay active and busy. The public needs help developing a complementary model of urban nature as a location for reflection and respite, and a sense of the value of such contemplative spaces for urban communities.

3. ***The Black Box of Process.*** Public valuing of urban nature is undercut by a lack of understanding about *how* and *why* nature is healthful to people. Helping the public understand the psychological and physiological benefits of access to nearby nature will likely build support for the expansion of access.

4. ***Individualism.*** The public's dominant model of nearby urban nature is as a location for individuals to improve their health through exercise. There is little recognition of broader community and public health consequences.

5. ***The Absence of Disparity.*** The public is not attuned to disparities in access to well-maintained urban nature. There is not a strong model that recognizes that *all* people should have access to nature, no matter where they live or their social or economic status.

6. ***Nature Is Not Necessary.*** The public sees nature as a nice, but not necessary, add-on to urban life. Until the public sees nearby nature as an essential feature of cities, they will easily default to other core concerns for how public resources should be used.

7. ***Fatalism.*** Public models of urban pathology—applied most strongly to poorer neighborhoods—suggest that some sections of cities are inherently unhealthy, and contribute to fatalistic thinking that little can be done to make them more healthy.

III. Research Methods

Expert Interviews

To explore and distill expert messages on nearby urban nature, FrameWorks researchers conducted 13 one-on-one, one-hour phone interviews with researchers, academics, advocates, policy experts, and design specialists working on these issues. These interviews were conducted in November and December of 2014 and, with participants' permission, were recorded and subsequently transcribed for analysis. FrameWorks compiled the list of interviewees in collaboration with the TKF Foundation. The final list was designed to reflect the diversity of disciplines and perspectives involved in work on nearby urban nature.[3]

Expert interviews consisted of a series of probing questions designed to capture expert understandings of the relationship between nature and human well-being, and the importance of nearby nature in urban contexts. In each interview, the interviewer went through a series of prompts and hypothetical scenarios designed to challenge experts to explain their research, experience and perspectives; break down complicated relationships; and simplify concepts and findings from the field. Interviews were semi-structured in the sense that, in addition to preset questions, interviewers repeatedly asked for elaboration and clarification, and encouraged experts to expand upon those concepts that they identified as particularly important.

Analysis employed a basic grounded theory approach. Common themes were pulled from each interview and categorized, and negative cases were incorporated into the overall findings within each category, resulting in a refined set of themes that synthesized the substance of the interview data. The analysis of this set of interviews resulted in the distillation of the expert perspective on cities, nature, and health presented below.

Cultural Models Interviews

The cultural models findings presented below are grounded in data gathered during 20 in-depth interviews conducted with members of the American public in January and February 2015 in four locations: San Jose, California; Kansas City, Kansas; Frederick, Maryland; and Los Angeles, California. Data gathered from these extended interviews were supplemented with an additional set of 32 10-minute interviews conducted on the street in Miami, Florida and Dallas, Texas in February and March 2015.

Cultural models interviews—one-on-one, semi-structured interviews lasting two to two-and-a-half hours —allow researchers to analyze the broad sets of assumptions, or "cultural models," that participants use to make sense and meaning of a concept or topic area. These interviews are designed to elicit ways of thinking and talking about issues—in this case, people's most "top-of-mind" and dominant ways of thinking about cities, nature, and health. As the goal of these interviews was to examine the cultural models that participants use to make sense of these issues, it was key to give them the freedom to follow topics in the directions they deemed relevant. Therefore, the researchers approached each interview with a

set of areas to be covered but left the order in which these topics were addressed largely to the participant. All interviews were recorded and transcribed with written consent from participants.

Recruiting a wide range of people and facilitating talk about concepts introduced by both the interviewer and the interviewee allows researchers to identify cultural models that represent shared patterns of thinking. Participants were recruited by a professional marketing firm and were selected to represent variation along the domains of ethnicity, gender, age, residential location (inner city, outer city, and regional/rural areas up to three hours from city center), educational background (as a proxy for socioeconomic status/class), political views (as self-reported during the screening process), religious involvement and family situation (married, single, with children, without children, age of children). The sample included 11 women and nine men. Thirteen of the 20 participants self-identified as "white," six as "black," and one as "Hispanic." Twelve participants described their political views as "Middle of the Road," five as "Liberal" and three as "Conservative." The mean age of the sample was 44 years old, with an age range from 21 to 69. One participant was a high school graduate, five had completed some college, 11 were college graduates, and three had postgraduate education. Fifteen of the 20 were married, and 14 were the parent of at least one child.

Although we are not concerned with the particular nuances or differences in the cultural models between different demographic groups at this level of the analysis (an inappropriate use of this method and its sampling frame), we hope to take up this interest in subsequent research phases where, for example, the use of large nationally representative survey experiments are better able to address such concerns.

For the analysis of both sets of interviews, FrameWorks' researchers adapted analytical techniques employed in cognitive and linguistic anthropology to examine how participants understand issues related to health, nature, and urban life.[4] First, researchers identified common, standardized ways of talking across the sample to reveal organizational assumptions, relationships, logical steps, and connections that were commonly made, but taken for granted, throughout an individual's talk and across the set of interviews. In short, the analysis documents patterns discerned from both what was said (how things were related, explained, and understood) as well as what was not said (assumptions and implied relationships). In many cases, analysis revealed conflicting models that people brought to bear on the same issue. In such cases, one of the conflicting ways of understanding was typically found to be dominant over the other.

In the next section, we present the expert messages that comprise an untranslated expert story of human health and nearby nature. This is followed by an analysis of the cultural models that members of the public bring to understanding these issues. We then compare these expert and public understandings in order to identify key overlaps and gaps. We conclude with a set of suggested areas that are promising for future research.

IV. Research Findings

The Expert View

Below, we present a distillation of the themes that emerged from the analysis of expert interviews and our review of relevant materials. These themes address the *salience* of nearby nature as a policy and funding focus; the *mechanisms* and *features* of nature that have salutary effects; and the kinds of *solutions* that experts advocate for enhancing those effects.

Why Does Nearby Urban Nature Matter?

When asked to explain why nearby nature in cities—and other institutional and built environments—is so important, experts focused on six themes:

- ***Cities are stressful.*** Experts explained that city living is stressful and has been linked with a range of negative health outcomes. They described how the basic building blocks of urban construction—concrete, steel, and asphalt—contrast with the textures and contours of nature, and how cities have been built to facilitate a busy and often enervating mode of living that requires high inputs of energy. In short, experts asserted that while cities have economic and other advantages, they also pose challenges to human well-being that can be addressed by increasing access to nearby urban nature.
- ***Human life and public health depend on nature.*** Experts agreed that nature supports human well-being in multiple ways. At a fundamental level, it consists of and is the basis for the quality of the food, air, and water that sustains us, and the interlinked life systems of the biosphere. Beyond bodily sustenance, nature is also critical to human psychological, emotional, and physical well-being, as our species evolved embedded in natural landscapes. Thus, constituent features of both our psychology and physiology are attuned to the experience of nature. In expert thinking, nature is not simply a nice "add-on," but is rather necessary and integral to individual and public health.
- ***Unequal access to urban nature contributes to disparities in other domains.*** Experts recognized that access to nature is not evenly distributed in American cities, and that economically poorer neighborhoods often have fewer trees, less mature canopy, and more poorly maintained public green spaces. In these communities, people have difficulty experiencing the benefits of nature that accrue to residents of more affluent city neighborhoods. In the expert opinion, this nature deficit not only coexists with, but also contributes to, a range of other disparities—particularly health outcomes, as the lack of access to nature shapes patterns of exercise, transportation, recreation, and diet; and provides little respite from urban stressors. Experts assert that the need for more nearby nature in economically challenged neighborhoods is made even more pressing by the fact that poor people often have fewer chances to visit nature in state and national parks and other non-urban locations.
- ***It creates a substantial return on investment.*** Experts argued that the economic payoff of investments in nearby nature is substantial. Improved well-being for city residents can result in savings across a range of other social services, including reductions in spending in health care, mental health, criminal justice, and homeless services. Experts spoke to the cost effectiveness of

building more nature into cities, as affordable interventions like planting more trees can have substantial public health benefits down the road.

- ***It is grounded in our evolution.*** Experts explained that for the vast majority of our evolution as a species we have lived embedded in nature to a greater degree than we do in modern life. Cities are a recent invention and, in important ways, they represent a contrast to nature. Experts emphasized that there is an innate consonance between humans and the natural world. As one expert put it, "*Our DNA did not evolve in concrete settings.*" While noting that nature is often dangerous to people—in the form of both tigers and tornadoes—there was universal emphasis on how experiencing nature's softer side—the rustle of a breeze through a tree's canopy, or the sound of flowing water across a rock surface—brings people into a mental and physical mode that is conducive to well-being. Experts emphasized that we must incorporate this knowledge about nature and evolution into our understanding of what daily life for all people should include.
- ***The nation and the world continue to urbanize.*** Experts noted that the majority (54%) of humans on the planet today live in urban contexts, and that by the year 2050 that number is expected to rise to 70%.[5] Already in the United States, more than 80% of Americans live in urban contexts. Experts noted that as this trend continues, sustaining people's mental, emotional, physical, and social well-being and assuring the quality of our individual and collective lives depends on building and maintaining cities that have nature as a consistent, core feature of their landscape.

How Does Nature Improve Human Well-Being?

Experts identified a number of ways in which nature improves human health and well-being, while also acknowledging that the mechanisms behind the relationships between experiences of nature and improved well-being are still being theorized and explored.

- ***It provides a necessary respite.*** Experts explained that the salutary effects of nature are magnified by its *contrast* to the stressful features of city, institutions, and the built environment. A transition into a natural setting—by sight, sound, or physical presence—can provide a positive and powerful break from the demands of life's busy-ness, and in the process open a breathing space for the mind and nervous system. A typical example could be something as simple as stepping away from the hot concrete and sound of traffic into a cool shaded space with the sound of birds. Experts described the importance of *thresholds* as key spatial markers of this transition from busy-ness to rest, and of *openings*—in the tree canopy or line of sight—to physically communicate that there is space to breathe and be restful.
- ***It restores mental capacity and nourishes the human spirit.*** Experts described how this time of respite in nature rejuvenates people's mental capacity and provides a high quality form of neurological rest, as the brain needs periods of rest, when it is free to attend to things in a more fluid, non-intentional way. Experts explained that being witness to events in nature allows for a form of gentle absorption and relaxed attention that scientists call "soft fascination"—an involuntary attentive mode that fuels rather than enervates the brain. As one expert put it, "*Nature is a positive distraction*." Experts described how this restorative function for the mind has positive effects on people's learning capacity and their overall sense of agency. Experts also spoke of this restorative power of nature as

extending to the spiritual dimension of life—that nature is good for the soul and nourishing to the human spirit.

- ***It reduces stress and boosts immune function.*** Experts explained that experiencing time in nature facilitates recovery from stressful experiences. When people can rest and be calm in nature, it facilitates activation of the parasympathetic system, which in turn strengthens the immune system. This contributes to stronger and faster recovery from a range of stresses to both the body and mind. Experts noted that the body of data about the positive health impacts of nature in cities (for example, the relationship between density of tree coverage and stress levels, as measured by salivary cortisol) is emerging and expanding.
- ***It strengthens communities and democratic society.*** Experts argued that nearby nature in cities that is safe and well maintained serves a key social function by providing locations for people to cross paths in relaxed and non-stressful contexts. In bringing people out of their homes and offices, nearby nature facilitates the development of "weak social ties"—bonds of familiarity and acquaintance that allow for stronger community engagement and collective action. These in turn provide the basis for strengthened participation and action in our shared democratic life. Experts also argued that by lowering people's stress levels, nature reduces tensions in interpersonal relationships, which has positive effects on health, family life, and crime.

What Features of Nature Support Well-Being?

When asked to explain the qualities and features of nature that have salutary effects for humans, experts focused on the following points:

- ***Nature works in both wild and tended form.*** In the expert view, the health benefits of experiencing nature extend across a spectrum from more wild to more tended forms. While nature in the wild reminds us of the durable roots of human and other life, tended nature calls attention to our mutuality with nature and a broader ethos of caring. Both tended and untended nature open a space for "soft fascination" at nature's processes and provide an immersive experience in the moment that results in profound effects on nervous and immune functions. In discussing tended nature, experts noted in particular the importance of our capacity to enhance nature for its effects on humans. By being intentional, we can construct spaces that include those elements of nature that are pleasing to human experience, including water, shade, views, colors, biodiversity, multiple textures, and places for both solitude and gathering respectively.
- ***Nature is neither concrete nor digital.*** Experts often defined nature by what it is not: angular concrete boxes that confine views; black asphalt surfaces that absorb heat; digital electronic devices that beep and ring. The focus of this expert talk was not that these constructs are inherently bad. Instead, experts asserted that humans require escape and respite from these inventions that have become pervasive in modern life. In contrast to these built features, nature is rounded, multi-textured, undulating, and emergent. In the expert view, it is these organic features of nature that give it its power to enhance health and well-being.
- ***Nature's effects come via many senses.*** While physical time in nature is thought to be the ideal, experts asserted that the sight and sound of nature also have salutary effects. By way of example, they

pointed to research suggesting improved health outcomes for hospital patients and learning outcomes for school students who have views of nature through windows.

- ***Trees, water, and long sight lines are particularly important.*** Across the interviews, experts repeatedly drew attention to our evolutionary connection to trees, water, and savannah-like vistas as a way to explain their appeal and value to human well-being. These features represent, as one expert put it, "ancient proclivities."
- ***Safety is key.*** Across this variability of natural contexts, experts strongly asserted the need for people to feel *safe* in their experience of nature if it is to provide positive results for their bodies and minds.
- ***Regular exposure is necessary.*** Experts explained that a single "dose" of nature has limited and short-term effects. They challenged the idea that nature is something "out there" to be visited when time and schedules allow. As one expert put it, "*You can't go to Yosemite once a year for a month and then just live off of that. We don't retain the effects for very long. So, you need a continual infusion of the stuff. And so, [having nature] nearby is the only way to do that.*" Because of this, experts emphasized that cities must be designed, built, modified, and maintained so that *all* residents have regular exposure to nature as a part of their daily life and routines of work, play, travel, and rest.

How Can Nature be Used to Improve Well-Being in Cities?

Experts consistently spoke about the need to strengthen the political and financial commitments necessary to expand access to nature's benefits to all residents in the country, in particular those experiencing chronic or acutely stressful life circumstances. As one expert put it, we need to create a situation where there is "nature at every doorstep" so that it is "accessible outside of each and every residence, or each and every office building, or retail shop, or school." Experts spoke to seven key directions for future policy, planning, and funding:

- ***Create more urban nature spaces.*** Simply stated, experts emphasized that to promote health and well-being for *all* of a city's residents, it is necessary to build more urban nature into a city's infrastructure. Currently, diverse experiences of nature are not available in all city neighborhoods, and are often sparse even in neighborhoods that do have urban nature. Given the importance of experiencing a "dose" of nature every day, it is crucial to prioritize the creation of such spaces.
- ***Fully fund existing natural infrastructure.*** Experts noted that our nation's current public mass transit and park management infrastructure is often underfunded at the federal, state, and local levels. This results in poor maintenance of the existing natural infrastructure that is part of both of these critical systems. For example, many city parks—especially those in poorer neighborhoods—are not well maintained with regular pruning of trees and bushes, reseeding of grass, and repairs of benches, fountains, and other built features. Experts argued that these existing green spaces must be protected, cared for, and improved.
- ***Shape the urban planning and architectural fields.*** Experts recognize that urban zoning and environmental, transportation, and land-use planning all have a critical role to play in shaping the amount, design, and distribution of nature in cities, as does the design and building of large institutional complexes like hospitals,[6] office buildings, schools, and commercial centers. As such,

experts argued for developing strategies to change and shape professional discourse and practice within these fields, and to leverage those changes to shape policy and funding decisions in both private and public domains.

- ***Target disparity.*** Experts asserted that most, if not all, cities in the U.S. have neighborhoods where well-maintained nearby nature is scarce and difficult to access on a regular basis. Remedying this deficit requires recognizing this as an important disparity—one that is linked to other disparities in health and education—and building the political and financial commitment to address it. Experts noted that this is not simply a case of "if you build it, they will come." Rather, the work of helping people see and value nature has to happen first, especially in communities where basic health, employment, and safety concerns loom large. This work requires helping people build a relationship with nature and see in concrete terms its benefits. Local knowledge and human capital must be leveraged in this process, and consensus and vision must be built *within* communities and not imposed from the outside. This holds particularly true for poorer communities who are rightly skeptical of "solutions" introduced from the outside.
- ***Provide a diverse range of nature experiences.*** Experts argued that there is no one-size-fits-all model for what constitutes healthy nature in cities. Instead, they argued for a broad range of nature spaces in cities, of varying sizes, shapes, landscapes, and locations that can serve diverse populations engaging nature for a range of purposes—silent reflection, social gathering, exploration, play, and extended travel within a city, to name a few. They noted that the current urban green space model is often too narrow—focused on exercise or traditional open park space—and that greater intentionality needs to be brought to bear on designing spaces that serve diverse populations and facilitate the restorative power of nature.
- ***Plant and protect trees.*** Experts consistently spoke to the importance of trees in cities and cited studies showing linkages between density of canopy coverage and health outcomes for residents across diverse neighborhoods. They argued both for more tree-planting efforts as well as regulations to protect existing trees from capricious removal.
- ***Build schools so that students spend time in nature every day.*** Experts argued that the importance of time with nature should shape how school days are scheduled and how school buildings are constructed and remodeled. They spoke to research showing that learning outcomes are boosted when children have daily exposure to nature—even simply the view of a tree through a classroom window—and argued for more outdoor learning time in nature. They also emphasized the importance of cultivating in children an appreciation of nature and its benefits so that they become adults who recognize the importance of integrating nature into our built environments. Several experts argued, in particular, that school boards should be pressured to allocate a greater percentage of school playgrounds to grass and natural landscapes rather than concrete, asphalt, and rubberized mulch.

Figure 1: **Expert Story**

Untranslated Expert Story of Nearby Urban Nature

Why does nearby urban nature matter?

- *Cities are stressful:* Cities pose challenges to human well-being that can be addressed by increasing access to nearby urban nature.
- *Human life and public health depend on it:* Nature is not simply a nice "add-on," but is critical to human psychological, emotional, and physical well-being.
- *Disparities in access to nature contribute to disparities in other domains:* Nature "deficits" contribute to disparities in health-related domains, as the lack of access to nature shapes patterns of exercise, transportation, recreation, and respite.
- *Creates returns on investment:* Affordable interventions that increase urban nature can have substantial economic payoffs down the road (e.g., improving public health outcomes).
- *We evolved in nature:* There is an innate resonance between humans and the natural world.

What features of nature support well-being?

- *Both wild and tended forms:* The health benefits of nature extend across a spectrum from "wild" to "tended" nature. Trees, water, and long sight lines are particularly important.
- *Neither concrete nor digital:* The organic features of nature —rounded, multi-textured, undulating, emergent—are part of what give it its salutary power.
- *Multi-sensory*: While physical time in nature is ideal, the sight and sound of nature also has benefits for health and well-being.
- *Safety is key*. People must feel *safe* in nature if they are to experience positive benefits.
- *Regular exposure*. A single "dose" of nature is likely to have limited and short-term effects. Exposure must be regular and sustained to produce meaningful benefits.

How does nature improve human well-being?

- *Provides a necessary respite:* Nature provides a critical contrast to the stressful features of cities, institutions, and built environments.
- *Restores mental capacity and nourishes the spirit:* Time in nature rejuvenates people's mental capacity and provides a high-quality form of neurological "rest."
- *Reduces stress and boosts immune function*: Time in nature facilitates recovery from stressful experiences by activating the parasympathetic nervous system and strengthening the immune system.
- *Strengthens communities and democratic society:* Urban nature facilitates the development of social ties that promote stronger community engagement and collective action.

How can nature be used to improve well-being in cities?

- *Create more urban nature spaces:* Nature spaces should be built into city infrastructure and planning so that all residents have access.
- *Fully fund existing natural infrastructure:* Funding should be made available to fully protect, care for, and improve existing green spaces and natural infrastructure.
- *Shape urban planning and architectural fields:* The architectural and urban planning fields should be involved in building strategies to increase nearby urban nature.
- *Target disparity:* Disparities in access to nearby urban nature must be addressed. Local communities should be involved in identifying and implementing solutions.
- *Provide a diverse range of experience:* Nature spaces in cities should serve diverse populations and needs (e.g., silent reflection, play, exploration).
- *Plant and protect trees:* Tree-planting efforts should increase and regulations to protect existing trees should be implemented.
- *Build schools so that students spend time in nature:* School schedules and grounds should be structured to facilitate children's interactions with nature.

The Public View

Below, we present the dominant cultural models—shared assumptions and patterns of thinking —that guide and shape the American public's view of nature in cities and its effects on the health and well-being of city residents. These models represent the conceptual constructs that are most powerful in orienting and organizing public thinking around these topics.

Key Foundational Models

Four foundational models that FrameWorks has identified elsewhere in our research with Americans were found to fundamentally structure people's understandings of health, cities, nature and the intersections between these topics.

1. ***Individualism*:** A deep underlying model of individualism was evident in people's talk about *cities* as locations for personal employment and career advancement, and about personal safety and cost of living challenges. The model was likewise evident in public talk about *nature* as a location for individuals to pursue their exercise regimes and about *health* as something that is largely determined by lifestyle choices and individual discipline in diet and exercise. Across the scope of public talk was an assumption that these topics matter because of how they shape people's capacity to advance individual life goals.

2. ***Consumerism*:** People's thinking about cities, nature, and health is also structured by the idea that human life is characterized by *production* and *consumption*. Cities are thought to epitomize the marketplace of jobs, opportunities, and consumables, which makes nature a tertiary feature to what cities are about. Furthermore, nature itself is also modeled as a consumable—as a source of food for literal consumption, and as a location for human recreation and other uses.

3. ***Ideal vs. Real Thinking*:** Americans are accustomed to distinguishing between *the way things are* and *the way they should be* and assume that the ideal is rarely achieved. This fatalism structures how the public thinks about a broad range of social and environmental challenges, including poverty, educational disparity, environmental degradation, and others.[7] This ideal/real contrast structures people's thinking about what a city *needs* in order to be a functional place, as opposed to what the "ideal" city might have. For most, nature in cities is an ideal, rather than a real necessity.

4. ***Modern Life Is Unhealthy*:** Across many areas of research, FrameWorks has documented a prevailing notion that modern life is inherently unhealthy—in terms of stress and work/life balance, exposure to environmental toxins, experiences of neighborliness and community life, safety for children, and a range of other metrics.[8] The research for this report confirmed that this idea is strongly applied to modern urban life in particular, as people think many of these problems and threats are more pronounced and concentrated in urban contexts. There is a tenor of inevitability to this modeling of urban life.

These foundational models provide the deep conceptual foundation of public thinking about cities, nature, and health. Below, we describe the more specific models that people use to make sense of these topics. We also describe how these underlying assumptions and patterns of thinking set up and structure understandings about the intersections across the three topics.[9]

Models of Cities

We started our interviews with the public with questions about cities in order to understand some of the fundamental ideas and assumptions that people have and use to think about urban contexts—both in terms of what city life is generally like, and what a city needs in order to provide a good quality of life for its residents. More than any other association, cities were identified deeply and pervasively across participant discussions with *constant activity and motion*, with both positive and negative implications. This association with cities and activity was modeled in the following ways:

A *Hustle and Bustle* Model: People talked about cities as locations of perpetual motion—physical, mental, and social. Foot and vehicular traffic is thick and constant, the pace of life is quick, noise is ongoing, and both work and leisure are active and busy.

> Participant: When I'm talking about bustle I guess I'm meaning just traffic, foot traffic and vehicular traffic. That's basically it. Peace and quiet is sometimes hard to come by.
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> Participant: I feel like a lot of times in the city part of that is just hustle-bustle, career-oriented people. Everybody is kind of flocking together and everything is a rush, rush, rush. So I think that's where you kind of lose part of the countryside, nature, that type of thing.
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> Participant: [The urban area] is not a place that you can lounge around in. Everybody has something that they are doing.

An *Entertainment* Model: People think of cities as places of energy, entertainment, and excitement, with restaurants, clubs, theaters, stadiums, and other venues and amenities where people gather to be stimulated and entertained.

> Participant: I would say more things to do, like—more enjoyable […] There's, like, everything. There's so much to do... That ideal city where downtown, it's quote "like an entertainment capital"—I mean, that's just a lot more enjoyable and all that positive stuff as opposed to, like I said, just nothing out in the boonies.
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> Participant: Of course, living in a city you have access to everything here. You have the choices are phenomenal. [...] You have so much available to you and you wouldn't have that in a rural area.

An *Opportunity and Productivity* Model: Cities are seen as the exemplary location for finding opportunities for employment, networking, and career advancement. While most opportunities discussed by participants were economic (e.g., job opportunities), others were educational, social, and health-related.

More broadly, cities are modeled as locations of productivity—places where ideas, ambitions, and careers are made and realized.

> Participant: There are work advantages. Lots of jobs. High paying jobs for the right skilled people.
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> Participant: If you live in New York, you can probably find another job at an equivalent or perhaps higher compensation just by walking around the block.
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> Participant: You have a broad range of choices; things to choose from that you would want to do.
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> Participant: And you know, education in general—college, high school, elementary. I think that would be a disadvantage of not living in a city. Cause I noticed the schools in a city have a whole lot more to offer than they do in the suburbs.

A *Pathology* Model: A strong negative model associates cities with many forms of pathology. Participants discussed pathology in terms of biological contaminants to avoid (e.g., dirt, pollution), environmental disruptions (e.g., noise), psychological issues (e.g., stress and conflict), and social pathologies (e.g., overcrowding, crime, violence, drugs, homelessness, poverty). These pathologies were closely knit together and often discussed interchangeably. This assumption structures a way of thinking about cities as locations for a range of significant threats and stressors.

> Participant: You are packed in a can of sardines and the more you are in tight quarters like that, the more stressful it is for people. I think people are very stressed out there. There's a lot of crime here.
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> Participant: Pollution, overcrowding, bad parking, too much traffic. Every city around the world typically looks the same. [...] I'm starting to get this sense that every city is like the same. I've gone to other countries too, but I just feel like they are touristy, there is pollution, it's over-crowded.
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> Participant: There's a real noise problem. [...] It's noisy and you live so close to each other and people aren't friendly with their neighbors, they don't know their neighbors.
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> Participant: There's lots and lots of homeless people on the street. In downtown LA, it's very hot in the summer, nothing but concrete and tall buildings and it seems like there's a different vibe, the smell downtown, no public restrooms available because they consider crimes to be committed there—prostitution, drug dealing.

In addition to the strong models of urban activity (both good and bad) described above, the other dominant model of cities can be best summed up by one word: "concrete."

A *Concrete* Model: Across the scope of both our Cultural Models and On-the-Street interviews, people made reference to concrete as the defining feature of urban landscapes. This was particularly the case once the topic of nature had been introduced, as the grey, rigid, angular features of concrete became the exemplary contrast to the organic, green, rounded qualities that participants attributed to nature.

> Participant: You know, it's a brick city; concrete buildings everywhere. In some cities you may have some green spaces here and there, but for the most part it's going to be all buildings and concrete and little trees, very little trees.
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> Researcher: Say you're in a city—how do you know that you are experiencing nature? How would you describe that?
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> Participant: I would say, like—if you're walking on dirt, you know, or grass, then you're basically in nature, you know. You're not, like, on a sidewalk—man-made concrete, you know. It's natural. It's from the Earth.

Key Implications of Models of Cities

The models described above portray cities as places of great energy and activity, characterized both by productivity and opportunity, as well as stress, threat, and contamination. As will be discussed in detail below, the strength of the contrast between concrete, busy, energetic cities and green, calming nature has mixed implications. On the one hand, it sets up an understanding of nature as a possible source of respite from the stresses of modern urban life. At the same time, however, it is one side of a deep and problematic dichotomy between cities and nature, one that contributes to the idea that nature is a desirable but not necessary feature of urban life.

Models of Nature

People's modeling of nature is complex, variable, and context-dependent. Three deep, foundational models of nature emerged in the interview data:

The *Purity* Model: This pattern of thinking models nature as largely untouched and uncorrupted by human hands—if not fully separate from humans, then at least not compromised by most human activity. In this model, human manipulation of nature detracts from its essential "naturalness." When this model is active, wilderness is the exemplar of nature, not an urban park or city grove of trees.

> Participant: There's a difference between that man-made nature. It's still nice but there's still an artificialness to it. It's not true, unblemished, uncompromised nature.
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> Researcher: So, this new topic [in our interview] is the topic of nature.

Participant: All right, I like nature.

Researcher: You like nature?

Participant: I do like nature.

Researcher: All right. What do you like about nature?

Participant: Well, you know, it's just untouched, you know. It's incorruptible in a way. It just gives. It just keeps on giving, I feel.

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Researcher: So right off the bat when I say "nature" what pops into your mind?

Participant: San Gabriel Mountains. I live right below them.

Researcher: Oh okay, so what makes you think of that as the prototypical nature?

Participant: Because it's not commercialized, it's untouched.

The *Everything Is Nature* Model: Alongside the *Purity* model is the idea that *everything* is part of nature, including people and those things manufactured by humans from nature. When this model was active in mind, participants described how everything derives from natural sources and as such is part-and-parcel of nature.

Participant: Because everything's man-made in some way from, you know, a tree to a computer. Somebody had to make it. Something had to make it. I think if you were to have to categorize everything, nature would be a good way—a good place to put it.

The *Everything Not Man-made* Model: According to this model—the most prevalent of the three nature models—nature is everything that is not man-made[10]—the trees, grass, animals, plants, natural water features, and air and sky. When this model is top of mind, members of the public view even those organic things that have been altered by human hand—groomed, planted, tended, or directed—as somewhat "less natural" than their wilder (and truer) kindred. Because of the strong contrast between what is "natural" and "man-made," people often struggled to talk about altered or cultivated nature as truly nature.

Participant: When I think of nature I think of something that's not man-made, you know? So, to me, that's like that concrete.

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Researcher: How would you define nature?

Participant: The grass, the ocean, the rain, the birds, the bees, the animals, that's what I think of when you say nature.

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Participant: Because it's not created. It's created by humans instead of naturally occurring. Or like I guess people plant trees, but if it's made out of materials that are created by humans or manipulated by humans and planted in a way that humans are going to construct it, then it wouldn't be nature.

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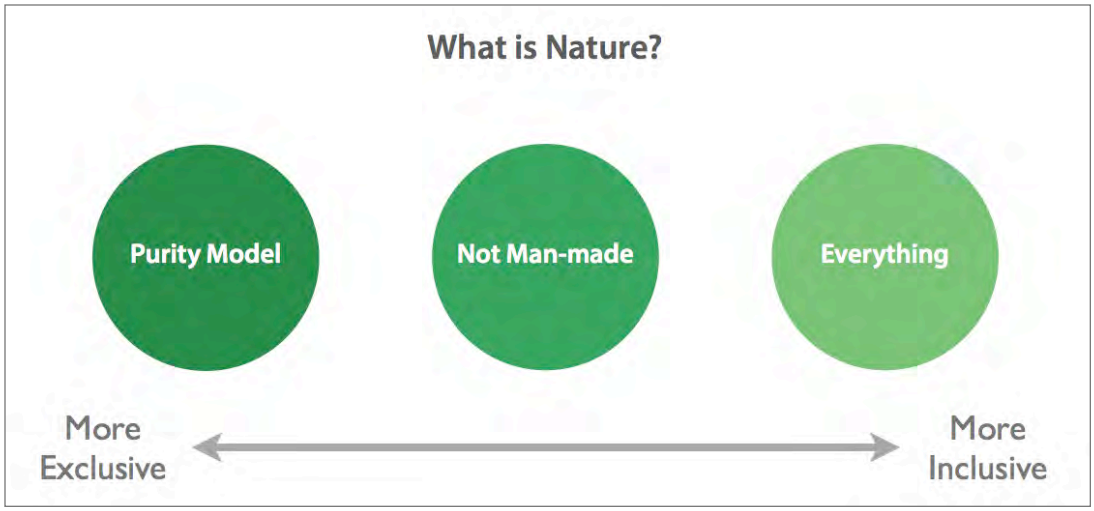
Participant: Obviously like playgrounds, basketball, that's not—I wouldn't consider it nature. But it's like a basketball court, a park, a play area, a dog park where your dogs can run around—it's specifically for them. Tennis courts—obviously, same thing as basketball and baseball parks.

Researcher: Are any of those nature?

Participant: I would not consider the man-made ones nature.

Figure 2: **Spectrum of nature models**



In addition to these three models of nature, there is a set of additional understandings that also powerfully structure how Americans think about nature. At a deep level, these cultural models are about the *relationship* between people and nature.[11]

An *Escape Away* Model: Participants described nature as a location away from normal everyday life and spaces. This "other" set of spaces was understood to provide much-needed respite from the hustle and bustle of normal, modern, post-industrial life. Importantly, this model positions nature as a location separate and away from daily life where people can take a break from the stress of daily activities and responsibilities.

Participant: I think mentally it's wonderful for you. Again it takes you away from your work, sometimes your kids. You know, if you want to just go read a book and just enjoy kind of looking around and seeing waterfalls, or just put your feet in a lake, look at beautiful flowers that bloomed. It just kind of puts you in [...] a happy state of mind, I guess. [...] Another way to kind of de-stress a little bit, instead of just being focused on your Blackberry.

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Participant: Less concrete, less asphalt. I don't know. My own preference is I would want to be in the [city] that has more nature. It's an escape. For me it's a place to go where I can get away from the urban.

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Participant: All the noise, all the chatter, all the distractions—everything that's man-made—it has its place. It has its purpose. It's done its purpose. That coffee got grinded. Hey, that's wonderful. It was nature and man coming together, but sometimes [...] we just need a break from this world. We just need a break from the cares and the vanity, the meaninglessness, you know. Those mountains have been there forever. And, you know, our little problems of this world are just during our short lifespan. So, that's why we go to nature. That's why we love our nature. Quite frankly, we live in a place where a lot of our elected officials also value that. We have these things called "national parks." They're huge. We try to preserve them.

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Participant: Nature is like a buffer. Nature is like a—just molecularly—it has a different charge than, you know, a building.

Researcher: So, how does it act as a buffer, would you describe?

Participant: It's more relaxing. It's a place where you exhale and you take a deep breath.

A *Sustenance* Model: This is the idea of nature as a source of resources and bounty for human survival and consumption. People talked about this largely in terms of the basics of food, water, and air, but also in terms of medicines and, most generally, as the "basis for life" itself. This is a highly instrumentalist model and is closely related to the foundational *Consumerist* model described above.

Researcher: What kinds of effects does nature have on us as humans?

Participant: It feeds us. I mean, it provides. [...] It's where we build on it, we eat from it, we need it to grow, we need it for everything.

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Participant: How can we survive without nature? It doesn't matter if you are a vegetarian or you eat meat or whatever, it all comes from nature. So without nature how do we eat? And if we don't eat, how do we live? So humans are powered by food. So if we destroy nature then we will cease to exist because we are dependent on nature.

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Participant: We rely on nature for everything if we think about it. Again, it's the water. It's the food. It's the shelter. It's how we live. If we didn't have that, we wouldn't be here.

A *Roots* Model: Participant discussions also revealed an understanding of nature as the source of human life—the idea that nature is "where we come from." Some participants expressed this model in evolutionary terms; others did not. What was shared was a sense of our species' groundedness in nature,

and of the peril of losing our connection to nature. This model has both pragmatic ("we would die without nature") and spiritual ("our souls miss nature when we don't have it") sides to it.

> Participant: It's like nature is our deepest history. We all come from nature, we all like existed, like we didn't have hotels, we didn't have cars; people were living fine a long time ago.
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> Participant: I guess like evolution. Humans come from nature. So just getting back to where you come from, getting back close to nature, it does something for you, it has some type of effect. That's just what it is, you know. Like we are animals; animals come from nature, you know. We are just the most sophisticated of them all. [...] In an essence, we come from nature.

An *Exercise and Recreation* Model: Participant discussion also evidenced an understanding that nature provides the setting for many forms of human relaxation and recreation—walking, running, swimming, hiking, bicycling, and a range of sporting and leisure activities. This model relates closely to the foundational consumerist model identified above in structuring a way of thinking in which nature's value derives from the specific functions it serves in human life.

> Researcher: When I say "nature" what comes to mind for you?
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> Participant: In general, or in the city?
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> Researcher: General, totally new topic.
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> Participant: Well, like the ocean and the hiking trails, skiing, surfing, like doing...I guess what comes to mind for me is doing things in nature. Physically involving myself in activities that take place in nature, a natural setting.
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> Researcher: For you, do you think it's important that there is nature in cities?
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> Participant: Yeah, definitely.
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> Researcher: And why is that?
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> Participant: As a person who has lived in cities, I've just really utilized the natural spaces a lot, for exercise or I mean, I guess mainly to go running or walking. Especially like for running.
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> Participant: I think adults need [places to play] too. Especially the trails, the walking trails. Cause I know myself, I've used the playground equipment as exercise—the pull-up bars. [...] So, I think it's very important to keep that kind of stuff. Cause you've got your runners. If you put up a building, where are they gonna run at?

An *Aesthetic* Model: Finally, many participants talked about the beauty of nature and ascribed importance to its aesthetic features. When thinking with this model, participants portrayed nature as a source of appreciation and wonder.

> Participant: When you see a tree blooming, you know, like the cherry blossoms, it's astounding. It's beautiful, you know. It's makes you want to keep going, you know. And it's inspiring. So, I do think it has a gigantic effect on well-being, even if it's just a tree.
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> Participant: We walked up, it was just a beautiful area, and you get up to the rocks and they had like this waterfall, it was just beautiful. There were people wading there with their feet in the water. And then there was another time I went to Great Falls which is absolutely stunningly beautiful to me and seen the creation of these falls, they are just beautiful. And being from North Dakota I've seen the Badlands, which was fantastic too—went on a country road, nothing compares to that. I think it's beautiful. Those types of things come to mind, I guess, when I think about nature.

Key Implications of Models of Nature

- Neither the most exclusive nor inclusive models of nature are consistent with the perspectives and policy goals outlined above in the expert story. The *Purity* model excludes the value and authenticity of nearby urban nature, while the *Everything* model mutes attention to the distinctiveness of that nature relative to other features of the urban landscape. Meanwhile, the dominant *Everything Not Man-made* model has both positive and negative implications. The model may provide a productive starting point for thinking about nature as a healthful contrast to the highly manufactured features of cityscapes. At the same time, the ways in which people struggled to define tended, planted or landscaped nature as fully "nature" suggests a need to help people understand the healthful benefits of these "man-made" natural features and shows the challenges of using this model as a framing asset.
- The *Escape Away* model also has mixed implications. On the one hand, the public's understanding of nature as a source of escape and respite from modern stressors is consistent with parts of the expert story, and therefore represents a key asset to be leveraged in communications about nearby urban nature. People's understanding of nature as *away* may also hold productive lessons for those designing urban nature spaces, suggesting the importance of clear spatial markings, boundaries, and transition points between normal and nature spaces. The challenge, however, is that the *Escape* model structures an understanding of nature as something that is, by definition, *separate* and *apart* from normal city life; it is something that one must escape *away to.* This spatial contrast complicates people's understanding of nature as something that can be *embedded* and *integrated* in urban settings, and sets up a central challenge for those seeking to expand public thinking about that necessary integration.
- The *Roots* model is potentially productive in highlighting the centrality of our connection to nature in ways that are consistent with the expert story. However, the mechanisms that underlie the

importance of this connection are only thinly modeled in the public's mind and require greater elaboration.

- The *Sustenance* and *Exercise and Recreation* models, which position nature as a resource to be used and consumed, also have mixed implications. Both point to the value and importance of nature, but they direct thinking in very specific ways that do not easily line up with the salutary effects of urban nature spaces as places of respite. The *Exercise and Recreation* model, in particular, sets up an understanding of urban nature that is at once narrow and highly culturally salient—as mostly about *staying* active, not seeking reprieve from activeness.

Models of Health

Our interviews with the public revealed the following dominant patterns in how people model an understanding of health and well-being:

A *Functioning and Freedom from Disease* Model: As FrameWorks has found in previous research, the assumption that health is a matter of being free from pathology and disease represents people's most fundamental and assumed model of health.[12] Health, according to this pattern of thinking, means having a body that is functional, has energy, and is not chronically or unduly encumbered by sickness or pathology.

> Participant: We're all gonna get older and have creaks and aches and pains, but you know, as long as I don't have tumors erupting all over my body and things like that.

A *Health Individualism* Model: As we have seen in many areas of FrameWorks' research (on aging,[13] healthcare,[14] environmental health,[15] others), the American public subscribes to a strong model of health individualism that holds individuals responsible for their own health. Lifestyle choices and the decisions people make—especially about diet and exercise—are deemed the primary factor that shape personal well-being.

> Participant: Well-being, as in eating healthy, living a healthy lifestyle, not a lot of smoking or no smoking, or drinking, you know moderately; exercise, trying to eat healthy foods.
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> Participant: I think everyone has their own decision whether they want to be healthy or not. There are consequences for your actions with everything. If you want to eat a double Big Mac or whatever the heck it is every day for the rest of your life, you're going to have clogged arteries or whatever, that's a consequence for your action.

A *Mental Health Matters* Model: People talked about well-being in terms of physical, mental, and emotional health. Relative to the stressors of city life, mental health loomed particularly large as a topic of concern. Participants frequently evoked people's time away from cities, in nature, as a way of mitigating the negative mental health effects that they attributed to urban life.

> Researcher: So when I say well-being, what do you think of right off the bat? What does that make you think of?
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> Participant: The state of self. If I were to describe it in one phrase or sentence, well-being is like how well you feel physically, emotionally, and mentally.
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> Participant: Well-being? I think about someone's mental health. Are they stressed out? Are they having feelings of hopelessness, suicidal thoughts, what's their physical health like? [...] I think it means how good you feel about yourself. Do you have healthy relationships that you are looking for? Are you so stressed out at work that you just can't function? How are you doing mentally, as well as your physical health?

Key Implications of Models of Health

- The *Health Individualism* model is particularly problematic relative to the expert story outlined above, as it typically serves to mute attention to broader systemic, structural, social, and geographic factors that shape health at the personal and population level. In framing a "where there's a will, there's a way" perspective on personal health, the model discourages attention to the ways that shared public infrastructure and policies shape health outcomes at the population level.
- The *Functioning and Freedom from Disease* model is also problematic, in that it directs focus to a relatively narrow definition of well-being by positioning health as "the absence of disease." When this model is active, it is likely to make it difficult for the public to appreciate the broader aspects of social, emotional, and community well-being that concern experts on nature and human health.
- The *Mental Health Matters* model is a more recessive but ultimately more productive orientation to health. It helps people establish a link between urban life and stress and mental health challenges, on one hand, and nature as part of the answer to these challenges. As such, it presents a strong opening for those working to expand public understanding of the importance of urban nature spaces.

Models of the Sacred

In light of the TKF Foundation's central notion of nature as sacred, interviews with the public also queried people's dominant understandings of sacredness and whether and how it applies to nature. Three models of sacredness dominated across participant talk:

- ***Sacredness Is About Religion*:** For many participants, the topic of "sacred" took their thinking directly to the domain of religious belief and practice.

> Participant: Well, it's interesting, just in thinking about the last question, "what's sacred," your response should be nature. But that's not really what comes to mind initially. But that is—I mean, to me that's very interesting to think. Initially when you asked me that, immediately my mind went to church and I don't even go to church.
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> Participant: I guess it's not really sacred, I guess it's something that's essential. Sacred, sacred, when I hear the word, I think "religion," you know I really do. The Bible, to a lot of people, it's sacred, it's the Word of God. Don't change it. Don't change it, don't try to trash it, it's something very important.

- ***Sacredness Is About What Is Valued*:** People argued that anything can be defined as sacred if it's of sufficient value and importance to a person.

> Participant: Sacred, what is sacred to me? Well, I've said my family. Maybe, not to sound too self-centered, but my own health and life.
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> Participant: When I think of something sacred I think about my personal space, my home, my time, my family, my friends.

- ***Sacredness Is Personalized*:** People consistently argued that what is sacred to one person may not be sacred to another. Instead, the definition of sacredness depends on an individual's belief system, values, and experience.

> Participant: I think everybody's answer to that would be different, but some people are more religious than others.
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> Participant: Special to you. Unique. Uniquely special, I guess, to each person.

Questions about sacredness generally came at the conclusion of the interviews, and it is noteworthy that even following a lengthy discussion of nature and its importance, only a small minority of research participants independently identified *nature* as something that is *sacred*. In short, our research does not show a strong default model for thinking about nature as sacred.

When asked *directly* about whether nature *can* or *should* be considered sacred, however, many participants agreed with this characterization. Notably, whether affirming nature as sacred or not, many participants then turned immediately to talking about the importance of protecting nature for the sake of preserving life on earth. This association between sacredness and environmental preservation is notable, and is likely rooted in both the *Roots* and *Sustenance* models identified above.

> Researcher: Do you think that nature is sacred? Would you describe it that way?

Participant: I guess you would have to say it is sacred. Because without nature what do we have? Like sacred means like protected, you know, like something that you should covet or something like that, so that's something that we definitely should protect and covet. Nature is sacred. Like you can't invent a new nature. If I cut off my arm, I can't grow a new one. They don't have science that good yet. So if we destroy the rainforest, we can't bring it back, it's gone now. So it's like sacred means something that you can't get back that you need to protect. So nature should be, I guess, deemed as sacred.

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Researcher: So if we go back to thinking about nature as potentially being sacred, you know? Say somebody said something like, "Sure, nature is sacred, but why does that matter? Who cares?"

Participant: It matters because if we don't connect with nature and if we don't take care of nature, it's going to destroy us. Because if we don't watch, if we don't maintain the balance of nature and we start letting things get extinct, that whole balance throws everything out of whack, and if your resources go away and your water goes away, and your air goes away what do you have left? So yeah, you have to protect nature.

Key Implications of Models of the Sacred

The public's dominant associations with the term "sacred"—religion and personalization, in particular—do not link up easily with the expert emphasis on the power of nature to provide spiritual nourishment and respite for the soul. Perhaps most notable, relative to the TKF Foundation's goals, is the quick default to thinking about environmental preservation when the topics of "nature" and "sacred" are brought together in thinking. While positive in terms of drawing attention to the importance of nature, the focus on preservation draws attention away from the importance of nature as an essential feature of city infrastructure. Instead it facilitates a cognitive default to a more familiar and scripted concern with environmental conservation and the need to protect nature "out there" on the grand scale. In the process, it may serve to distract thinking away from the importance of nature in cities.

Intersections in Public Thinking About Cities, Nature, and Health

Across participant talk about cities, nature, and health, several prevalent patterns emerged in how people understand the intersections of these topics. Below, we discuss each of these patterns, and their implications for communicating about the value of nearby urban nature.

The world is either "man-made" or "natural."

Perhaps the most important theme running across the data is a strong and prevailing contrast between the "man-made" (buildings, technology, manufactured materials) and the "natural," and people's strong desire to maintain this conceptual distinction. Within this contrast, cities serve as the prototype of the man-made, while wilderness epitomizes the natural. Thus, at a very deep cognitive level, cities and nature are opposed categories in people's thinking, even as people recognize that they are not always exclusive in

practice (in urban parks, for example). This contrast between cities and nature was seen in the data in a variety of ways: as the opposition between concrete and grass in the physical landscape; and as the opposition between busy-ness and stress, and reflection and reprieve, as qualities of human experience.

> Participant: Pretty much any time you go out of the city, most of what you're able to see with your eyes or smell with your nose or hear—the further you go away from the city, the closer you are to nature, to the world before man, independent of man.
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> Participant: Palisades Park—it has a lot of people in it; it has squirrels, overlooking the ocean. I consider it very close to nature but not yet nature because it's artificial. It's heavily crowded—not a lot of wildlife; not serene; you have all the traffic.
>
> --
>
> Researcher: Is there an opposite of nature?
>
> Participant: That's what you'd say of a city.
>
> Researcher: Really, okay.
>
> Participant: I think so.
>
> Researcher: Why? What makes the city the opposite of nature?
>
> Participant: Simple because of the elements. You have your grass, trees, animals, creatures, and this ideal of unexpectancy, I guess. Whereas the opposite of that would be structures, buildings, people—knowing when you go outside you're gonna see people walking past your door and cars on the street.

Several participants struggled, at least initially, to maintain the separate categories they had just so easily constructed, before usually succumbing to a recognition that even tended or planted nature is "still nature." This cognitive struggle is important. The complication presented when the deep contrast between man-made and natural is violated points at what might be the main challenge in communicating the expert story of urban nature spaces.

> *Implications:* People's proclivity for and comfort with classifying things into "man-made" or "natural" (and their struggles when these classifications are blurred) reveals an underlying cultural classification system that is challenging for those communicating about urban nature spaces. These spaces, to some extent, defy these categories and therefore take extra effort to conceptualize as a natural and necessary feature of human life. Communicators will need to develop ways to negotiate this *man-made vs. natural* classification system and build a more integrated model that blurs these lines in productive ways. This will be a major focus in prescriptive reframing work.

Nature is healthful.

The public holds a strong underlying model of nature as salutary for people. Spending time in nature (the "friendly" version) is seen to be consistent with and supportive of human life and well-being. More generally, there was an underlying assumption that what is natural is good and what is artificial is bad, or

at least, less good, and people applied this logic to thinking about behaviors, environments, consumables, and the world overall. In this model, nature is thought to be more consistent with human life than is the manufactured world, even as people appreciate and consider necessary many features of that manufactured world. This assertion of nature's benefits is consistent with both the *Sustenance* and *Roots* models of nature identified above.

> Researcher: Do you think that nature can have a general effect on people's well-being?
>
> Participant: I think people who are in nature, who are present in nature, probably have generally better well-being than people who don't get access to nature or aren't in nature.
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> Participant: It's just like so pristine, you know, and it hasn't been commercialized like this because it's untouched and it's just to me, it just gives me a feeling of making me feel like I'm healthier and I have more life and more energy.
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> Participant: I think it helps you kind of clear your mind. I think it reduces stress. I mean there's so many studies out that prove kind of the effects of even walking in a forest, how that can bring about a good effect. I mean I think that those are things that people need, especially in such a high-tech driven society.

Implications: As a baseline assumption in public thinking, this strong association between nature and health provides a critical starting point for communicating the expert story outlined above. However, there is still considerable communications work to be done in order to realize the full potential of this deep and powerful association as a framing strategy. Notably, our research shows clearly that the underlying *mechanisms* that make nature healthy are not well understood by the public. The closest people come to identifying mechanisms is the idea that nature provides a respite from the stress and busy-ness of modern life. As such, it is clear that the public still has much they can learn about *how* and *why* nature has positive effects on human well-being, even as they already accept the premise. Finding effective ways to provide this *how* and *why* information will be one of the primary challenges of reframing research.

Urban nature = parks and paths.

When asked to think about urban nature, people's dominant tendency is to think about city parks, along with some attention to bike and pedestrian paths.

> Researcher: So when you think about nature in cities what do you think about?
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> Participant: I think about Golden Gate Park, Lands End, like Presidio, just a ton of different parks where, you know, it's an outdoor setting in the city and also the whole walk around the park.
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> Researcher: So you know do you think that there is nature in the cities?

> Participant: I don't think there's nature in downtown LA, unless you count the zoo or the La Brea Tar Pits. It's not really downtown. Or museums—you can look at nature under glass. But maybe some cities do have nature, have a lot of parks, places you can hike, but not downtown.

When it comes to city parks, people have three strong associations:

- Parks are locations for relaxation and recreation, and are especially important for children's play.
- Parks are locations for social and family gathering.
- Parks are locations of crime and homelessness.

Implications: The public's first two associations with city parks are productive, in that they bring to mind the value of parks as important features of urban landscapes. While neither is specifically about the salutary effects of nature for people, they are consistent with an underlying model of green spaces as places where people take a break from the demands of productive and work life. That said, it is notable that people still see parks as places of *activity*. Parks and paths are places to ride your bike, power walk, exercise, and otherwise *remain* active. In that respect, they are often envisioned as locational *extensions* of a more active and busy urban life, an association that mutes attention to the importance of urban nature as locations for taking an intentional break from constant motion and activity. The focus on exercise and recreation also contributes to a narrower model of the kinds and diversity of spaces that urban nature should include, excluding the value of places for quiet reflection and a simple appreciation of nature's processes. In general, the public's models of urban nature present challenges to the goal of building support for nature contexts that are places of respite and retreat from busy-ness and activity.

The third association, with crime, is clearly problematic, in particular because it was so often described relative to parks that are set apart from everyday patterns of movement (foot traffic, etc.). In this respect, it is precisely their "set-apartness" that contributes to their level of perceived danger. In this model, it is those parks that are linked to the busy-ness of everyday urban life that are the safest. This link between urban nature and crime presents a direct challenge for communicating the expert story outlined above.

The* Escape Away *model is not applied to urban nature.

As discussed above, the model of nature as a location for taking respite from the stressors of modern life is extant, but it is not dominantly applied to *urban* nature. Related to point #3 above, people model urban nature as mostly about socialization and recreation, not respite. In this way of thinking, it is nature "out there" (large patches, away from cities) that is the truest and most powerful version of nature. This power is understood to derive precisely from the fact that "true" nature spaces are removed from the daily patterns of quotidian life.

> Participant: I do think of nature as being able to get in the car and just drive an hour and, you know, get out and go explore.

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Researcher: So when you think about that, does it seem like a big problem that there's not that green space for people or does it just feel like, well, whatever, it's not a big deal?

Participant: Folks who are moving to those cities, [not much green space] is what they expect, so they are fine with that. They can always take a reprieve and take a drive somewhere, take a vacation somewhere and recharge if that's what it's going to do for them, but I don't think it's really going to have an adverse effect on people living there because they live there for a reason. You have options out here.

Notably, when people were asked during interviews to recount "a memorable experience" with nature, two patterns dominated:

(1) *Extra-urban nature:* People's most memorable experiences were typically in locations that represent a departure from their everyday routines, usually in locations away from urban and suburban contexts: national parks, beaches, travels abroad, expeditions, etc. These experiences seemed to stand out precisely because of how they contrast to daily routines, commitments, landscapes, etc.

(2) *Family vacations:* Family loomed large in these memories of nature. This was likely the product of the confluence of family vacation time with trips away from domestic and quotidian life.

Researcher: Could you explain or describe an experience for me that you've recently had with nature?

Participant: Yeah, we were just up skiing last weekend and it was beautiful and at the top of the run and, it's like desolation, it opens up there. [...] When you are up there on top of the runs, you look all around down the mountains and you don't see anything except for mountains and snow and it's so beautiful and it's just awesome.

Implications: The assumption that the most healthful nature is outside of cities—in the form of large patches like national parks, wilderness areas, and long beaches—presents a challenge in ascribing real salutary power to daily experiences of smaller patches of nature in urban contexts.

Together, these models make up the "swamp" of public thinking about urban nature—a set of implicit understandings and assumptions that exist just under the surface and become active when people are asked to think about urban nature and related issues. The following graphic depicts this swamp of public understanding.

Figure 3: **Swamp of cultural models**

V. Mapping the Gaps in Understanding

The goals of this analysis have been to: (1) document the way experts talk about and explain the intersections of nature, health, and urban life; (2) establish the ways that the American public understands these same intersections; and (3) compare and "map" these explanations and understandings to reveal the gaps and overlaps between the perspectives of these two groups. We now turn to this third task.

There is an important set of overlaps between expert and public perspectives that provides a place to start and build from in creating effective communications about the healthful benefits of nearby nature in cities. That said, and as will become apparent, several of these overlaps are also linked to important gaps between experts and the public, making their implications for strategic communication anything but straightforward.

Overlaps

1. **Nature is our roots.** Both experts and the public have a model of nature as the source of human life—where "we" come from as a species. While expert knowledge is more detailed and more firmly grounded in evolutionary biology, the availability of the model in public thinking suggests an opportunity to embed a call for nearby urban nature in a deep model of human connectedness to nature.
2. **Nature sustains us.** Experts and the public both understand that nature provides the sources of human sustenance. This is an important baseline overlap. However, as described below, public thinking about nature is more consumerist in tenor, and less attuned to the importance of biodiversity and the linkages across ecosystems.
3. **Cities present challenges to human well-being.** Experts and the public both think about cities as locations for a range of stressors that can undermine health. These include the non-stop hustle and bustle of urban life, as well as elevated levels of congestion, air pollution, and a concrete landscape that is variously described as "hard," "cold," "grey," and "depressing."
4. **Safe nature is salutary.** Both experts and the public recognize that nature that is experienced as safe can contribute positively to human well-being by providing a location for respite from the stressors of modern urban life. This shared understanding is premised both in a model of safe nature as intrinsically good for people, and in the idea that nature provides a necessary contrast to the stressors of modern urban life. This overlap quickly morphs into a gap as members of the public attribute this positive function to nature-*away* spaces while experts see these benefits conferred from experiences with nature *in* urban spaces.
5. **Trees and water are important.** Both experts and members of the public consistently brought up the importance of trees and water as locations for rest and positive distraction from the stresses and busy-ness of life.

Gaps

Alongside these overlaps are a series of key gaps between expert and public thinking. Many of these gaps exist at a level deeper than the overlaps, as they deal with fundamental issues of how and why nearby nature in cities is important for human health and well-being. Many of these gaps are also the result of the public simply lacking an operative model for thinking about an area of expert understanding (what we refer to as "cognitive holes").

1. ***Nearby Nature: Necessary vs. Ideal.*** While experts see nearby nature as necessary to human well-being and thus an essential feature of urban landscapes, the public sees nature as a nice, but not necessary, add-on to urban life. *This is a core salience gap between experts and the public.* Until the public sees nearby nature as an essential feature of cities, they will easily default to other core concerns and urban nature spaces will remain low in people's priorities for the use of public resources.
2. ***Defining Salutary Nature: Tended vs. Pure.*** Experts see nature that has been tended by human hand as fully nature, and argue that human intentionality and design can augment and facilitate nature's healthful benefits, including in small spaces embedded within urban contexts. Meanwhile, the public's *Purity* and *Everything Not Man-made* models of nature complicate their thinking about tended or designed nature. The public's default pattern is to think about nature that is "out there" and away from cities as that which is most salutary. The data suggest that it is possible to direct public thinking towards the salutary benefits of tended nature, but that this framing will require developing and testing specific strategies to most effectively facilitate this understanding.
3. ***Respite: Nearby vs. Far Away.*** In a related vein, experts argue that even a small garden or grove can provide a location for an immersive experience in nature's processes and the "soft fascination" that results in physical and psychological benefits. The public thinks mostly about nature on a grander scale, far removed from cities. They see nature as a set of places that can provide a needed break from the stressors of modern urban life by removing people from everyday routines and hustle and bustle. As with the *Tended vs. Pure* gap above, there is reason to believe the public can be helped to understand the value and power of even small urban nature locations, but again, this will require careful design and testing of framing tools and strategies to determine their effectiveness.
4. ***Mechanisms: Scientific Understandings vs. A Black Box.*** While the public understands that time in nature can contribute to well-being, there is little understanding, beyond the idea of stress reduction, of the processes that underlie these effects. The effects of nature that experts emphasize —on the nervous and immune systems and on executive function skills like attention—are not part of public thinking. Instead, these underlying mechanisms exist in a black box and remain largely unrecognized by the public. It is likely that helping the public better understand *how* nature contributes to well-being will serve to augment its importance and help build support for the broader initiatives of the TKF Foundation.

5. ***Scale of Outcomes*: *Public vs. Individual Health***. Experts think about the healthful effects of urban nature at the population level and consider this a public health issue. The public thinks about urban nature through a strong model of health individualism that focuses on how nearby nature facilitates more exercise and better lifestyle choices that shape individual decision-making and health outcomes.

6. ***Diversity of Urban Nature: Broad vs. Narrow Vision.*** Experts articulate a broader and more diverse vision for nearby nature in urban context than do members of the public, who are largely focused on conventional park spaces and walking/bike paths for exercise. The breadth of the expert vision derives from their assertion that nearby nature in cities should provide a range of experiences and functions for people, including as locations of respite and reflection that are in some way set apart from the busy-ness of foot and bicycle traffic and recreational activities.

7. ***Dosage: Daily vs. Highlight Experience.*** Experts argue for building urban nature infrastructures that maximize *daily* exposure to nature for all of a city's residents, recognizing that the salutary value of nature is one that accumulates over time and must be continually renewed. The public has a model of nature's power as a memorable highlight experience—often from a vacation or weekend exodus—that provides a person a much needed break from work life and partly sustains them for another "round" of work and stress.

8. ***Disparity: Prevalent vs. Not on the Radar.*** Experts recognize that access to nearby nature in U.S. cities varies dramatically by neighborhood, with poorer neighborhoods often having fewer well-maintained green spaces available, which contributes to health disparities across communities. The public is not attuned to this idea of differential access to urban nature. Furthermore, the broader health and community outcomes that link to this differential access are not on the public's radar.

9. ***Return on Investment: Substantial vs. Not on the Radar.*** Experts spoke to the broader collective benefits that accrue to communities in cities when well-designed nearby nature is made readily available, including improved health, stronger community relations, and reduced crime—benefits that translate into public savings overall. The public is not attuned to the overall cost efficiency of upfront investments in nearby nature.

10. ***Implications for Collective Life: Civic vs. Social.*** Experts take a long-term view of the civic benefits of nearby nature to argue that it makes communities stronger and ultimately strengthens democratic action and advocacy at the local level and beyond. Members of the public think about how urban nature can facilitate friendly relations within a neighborhood but generally do not extrapolate to larger community and democratic civic action.

11. ***Attention to Design: Quality vs. Quantity.*** Experts bring a careful attention to design to their advocacy for nearby nature in cities, arguing for intentionality about design choices and attunement to specific features of nature (e.g., thresholds, openings, sight lines) that are linked to human well-being. The public is largely not attuned to these issues and instead holds to a more generic model of urban green space (city parks, bike paths) and a concern with the *quantity* of such spaces, not their distinctive qualities. For the public, design is largely a taken-for-granted feature.

12. ***Solutions: Complex vs. Simple.*** While experts speak to a broad range of necessary steps to better enhance the healthful role of nature in urban life—including attention to funding, communications, urban planning, community engagement, and schools, the public largely defaults to a simpler idea that "more parks and paths would be nice" and underestimates the importance of the issue and the steps necessary to realize its promise.

VI. Conclusion

This report highlights some of the central challenges involved in engaging members of the American public in a productive conversation about the importance of nearby nature in cities. Those challenges suggest a set of key communications tasks, described below. Addressing each of these tasks will require identifying and testing reframing strategies and tools that can be used to put forth a new narrative around the issue of urban nature in cities.

In particular, future research should seek to develop and test strategies that help people:

- Believe that nature can make a meaningful difference in the health of city residents relative to a range of emphasized urban pathologies.
- See nature as restorative sites in cities, not only "out there" in wilderness and vacation locations.
- Value nature in cities not only as an extension of modern busy-ness and activity (through exercise, recreation, etc.), but also as a valuable counter to it.
- Understand better *how* nature improves human well-being in order to emphasize the importance of daily access.
- Recognize that human intentionality and design can augment the salutary power of nature.
- See access to nearby nature in cities as a public health issue, not simply something that facilitates more nature for individual consumption and use.
- Recognize that *all* people should have access to nature, no matter where they live or their social or economic status.

Effectively reframing public understanding of the importance of nearby urban nature, and its role in individual and community well-being, will require the use of new communications tools and strategies that are specifically designed to bridge the gaps described above. Below, we provide a preliminary sketch of potential reframing ideas to explore in future research.

- Identify and test **Values** to help members of the public understand the importance of nearby nature in urban settings as a vital *public good*.

- Develop and test **Explanatory Metaphors** that address several of the core gaps and tasks identified above, such as the cognitive tension between cities as something "unnatural" and "man-made" and nature as something that is, by definition, untouched by human hands. Such a metaphor could open up more cognitive space to consider how nature can be integrated into urban settings, and how urban nature can serve as a key location of respite for city dwellers. Likewise, research on Explanatory Metaphors could focus on clarifying the *processes* through which these spaces are healthful to help people connect urban nature spaces with positive public health outcomes. These kinds of shifts in understanding of what urban nature spaces *do* and *why* they are important could yield increased public support and demand for these spaces as necessary features of an urban landscape.

- Test communications hypotheses that emerge from the untranslated expert story. For example, does emphasizing the "return on investment" that accrues from making nearby nature in cities readily available increase public support for such policies?

As researchers, advocates, practitioners, and designers coalesce around the growing understanding of the salutary power of nature in urban contexts, the need to translate this knowledge for members of the public —and thereby elevate support for policies designed to make nature accessible to all—is increasingly important.[16] However, this translational task is far from simple. Instead, reframing the public discourse about nearby nature in cities will require a comprehensive communications strategy, one that extends the research presented here to develop and test original messaging tools that can generate broader understandings of the value of urban nature for all residents, in all cities.

About The FrameWorks Institute

The FrameWorks Institute is an independent nonprofit organization founded in 1999 to advance science-based communications research and practice. The Institute conducts original, multi-method research to identify the communications strategies that will advance public understanding of social problems and improve public support for remedial policies. The Institute's work also includes teaching the nonprofit sector how to apply these science-based communications strategies in their work for social change. The Institute publishes its research and recommendations, as well as toolkits and other products for the nonprofit sector, at www.frameworksinstitute.org.

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About TKF Foundation

Founded in 1996, the TKF Foundation has been dedicated to working with communities, correctional facilities, NGOs, and health care and faith-based organizations to create publicly accessible urban green spaces called "Open Spaces Sacred Places". More than 130 Open Spaces Sacred Spaces have been created in support of TKF's mission to provide opportunity for a deeper human experience within carefully crafted public green spaces that offer temporary sanctuary, encourage reflection, provide solace, and engender peace and well-being. Every space includes a custom bench and a journal offering a comfortable place to sit, reflect and share experiences. In 2013 the Foundation awarded grants to six national projects designated as National Nature Sacred Awardees. This one-time funding program integrates design and applied research to provide scientific evidence about the benefits that people gain from nearby nature experiences in cities. To learn more about the Nature Sacred projects, the Foundation and Open Spaces Sacred Places you can visit, go to **www.naturesacred.org.**

Endnotes

[1] See Wolf, K., Flora, K., & Housley, E. (2012). *Research on the beneficial aspects of the experience of nature in cities: A literature review.* Annapolis: TKF Foundation. See also Wolf, K. & Housley, E. (2013). *Feeling stressed? Take a time out in nature.* A NatureSacred Research Brief. Annapolis: TKF Foundation.

[2] For an introduction to cultural models, see D'Andrade, R. G., & Strauss, C. (Eds.). (1992). *Human motives and cultural models* (Vol. 1). Cambridge: Cambridge University Press.

[3] The sample included one member of each of the six NatureSacred research projects currently being support by TKF, as well as seven external experts. For more on the NatureSacred projects see: http://naturesacred.org/

[4] See Quinn, N. (Ed.). (2005). *Finding culture in talk: A collection of methods.* New York, NY: Palgrave Macmillan.

[5] See http://www.un.org/en/development/desa/news/population/world-urbanization-prospects-2014.html

[6] Experts emphasized that, in addition to poor and marginalized neighborhoods in cities, efforts to build more nature into our built environment should target medical and therapeutic locations, where both patients and staff require healing and respite from both physical and mental stress and come to their engagement with nature with distinct challenges and needs.

[7] See for example Volmert, A., Baran, M., Kendall-Taylor, N., & O'Neil, M. (2013). *"You have to have the basics down really well:" Mapping the gaps between expert and public understandings of STEM learning.* Washington, DC: FrameWorks Institute. See also Volmert, A. et al. (2013). "*Just the earth doing its own thing:" Mapping the gaps between expert and public understandings of oceans and climate change.* Washington, DC: FrameWorks Institute.

[8] See for example Lindland, E., Volmert, A., Haydon, A., & Ford, A. (2014). *"Everyone's young or old…:" Mapping the gaps between expert and public understandings of demographic change in the U.S.* Washington, DC: FrameWorks Institute.

[9] In light of the TKF Foundation's central notion of "nature as sacred," interviews with member of the public also queried people's dominant understandings of sacredness and whether and how it applies to nature.

[10] This term "man-made" was the one consistently used by our research participants. Despite its semantic gender bias, we have chosen to retain its usage to reflect this currency in public discourse and thinking.

[11] It should be noted that our interviews overwhelmingly invoked an idealized, even "friendly" version of nature. We did not get much talk about tornadoes or tsunamis, nor about snakes and bears. This was likely structured in part by the interview context, as well as the ready availability of these positive and instrumentalist models of nature.

[12] See for example Lindland, E., Fond, M., Haydon, A., & Kendall-Taylor, N. (2015). *Gauging aging: Mapping the gaps between expert and public understandings of aging in America.* Washington, DC: FrameWorks Institute.

[13] Lindland, E., Fond, M., Haydon, A., & Kendall-Taylor, N. (2015). *Gauging aging: Mapping the gaps between expert and public understandings of aging in America.* Washington, DC: FrameWorks Institute.

[14] Aubrun, A., Brown A., & Grady J. (2006). *Health individualism: Findings from cognitive elicitations among Californians.* Washington, DC: FrameWorks Institute.

[15] Lindland, E., & Kendall-Taylor, N. (2011). *People, polar bears, and the potato salad: Mapping the gaps between expert and public understandings of environmental health. A FrameWorks research report.* Washington, DC: FrameWorks Institute.

[16] See Wolf, K., Flora, K., & Housley, E. (2012). *Research on the beneficial aspects of the experience of nature in cities: A literature review.* Annapolis: TKF Foundation.