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THE FUTURE OF THE COMPREHENSIVE PLAN

David Rouse*

ABSTRACT

This article begins with a brief history of the comprehensive plan from its historic roots to the present day. It then considers contemporary comprehensive planning practice, using the *Comprehensive Plan Standards for Sustaining Places* developed by the American Planning Association (APA) as a benchmark. The article concludes by exploring how the comprehensive plan can and must evolve to address the major challenges of the 21st century. It draws on research and content from *The Comprehensive Plan: Sustainable, Resilient and Equitable Communities for the 21st Century* (Rouse and Piro 2022).

INTRODUCTION

The comprehensive plan (also referred to as the general plan or community master plan) is the leading policy document guiding the long-range development of counties, cities, towns, and other local jurisdictions across the United States. As such, comprehensive planning is the planning activity that can be most impactful in bringing about lasting community change. However, this potential has not been realized in practice.

In the 20th century, comprehensive plans were organized into discrete topical elements that focused on physical development; were developed through top-down processes with limited citizen engagement; and were largely implemented through zoning codes and ordinances. A new comprehensive planning model began to materialize in the closing two decades of the century and has become established in practice. The prototypical 21st century comprehensive plan addresses community values and issues identified through community engagement, is organized around cross-cutting themes rather than topical elements, and explores dimensions (for example, health, equity, and sustainability) that transcend land use and physical development. While promising, this new model is still in development and little research has been done on its effectiveness in effectuating long-term change compared to the traditional model. This article addresses the following question:

How can the comprehensive plan, the product of 20th century planning practice with a mixed track record of success, continue to

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evolve to help local communities meet societal challenges like climate change, socioeconomic inequality, and technological disruption?

A brief history of the comprehensive plan starts this article, tracing its historic roots to the present day. It then uses the *Comprehensive Plan Standards for Sustaining Places*, developed by the American Planning Association (APA) as a benchmark on which to assess contemporary comprehensive planning practice. Drawing on research and content from *The Comprehensive Plan: Sustainable, Resilient and Equitable Communities for the 21st Century* (Rouse and Piro 2022), the article concludes by exploring how the comprehensive plan can and must evolve to address the major challenges of the 21st century.

A BRIEF HISTORY OF THE COMPREHENSIVE PLAN

The historic roots of the comprehensive plan date back to A Standard State Zoning Enabling Act (SZEa) and A Standard City Planning Enabling Act (SCPEA), published by the U.S. Department of Commerce in 1926 and 1928, respectively. The SZEa called for zoning regulations to “be made in accordance with a comprehensive plan” in order to, among other purposes, “facilitate the adequate provision of transportation, water, sewerage, parks, and other public requirements.” Intended to complement the SZEa, the SCPEA directed the planning commission to “make and adopt a master plan for the physical development of the municipality” and elaborated on the purpose, contents, and legal status of the plan (also referred to as the comprehensive or official plan). All 50 states adopted versions of the SZEa and many have adopted elements of the SCPEA (Meck 1996).

The post-World II era was a time of rapid growth and development for the United States. Section 701 of the Housing Act of 1954 provided a major boost to comprehensive planning practice by making funding available to smaller communities that lacked resources for planning. Federal appropriations from 1955 to 1981 (when the 701 program was rescinded) totaled over \$1 billion, enabling thousands of local jurisdictions to prepare comprehensive plans (Feiss 1985). The program contributed to widespread acceptance of planning as a local governmental function and of comprehensive planning as a core planning activity.

First published in 1964, *The Urban General Plan* by T.J. Kent provided a guide to comprehensive planning practice in the post-World II era (Kent 1990). Kent asserted that the general plan should (1) be long-range, comprehensive, and general in nature; (2) focus on physical development; and (3) provide a policy guide for decision-making rather than a detailed implementation program. He identified the city council (the elected representatives of the people) as the client of the general plan. While Kent referred to the role of the general plan in “providing an

opportunity for citizen participation,” he did not specify such participation as part of the plan preparation process.

Kent’s description of the general plan typified the *rational planning* approach, which emerged as the predominant planning paradigm in the post-World War II era (Brooks 2002). Rational planning is a top-down process in which planners use their technical knowledge to analyze and synthesize data and present choices to decision-makers in a sequence of logical steps to develop the plan. Alternatives to rational planning emerged in latter decades of the century, a time of societal turbulence and change marked by watershed events such as the Civil Rights movement, Vietnam War, Earth Day, and the environmental movement. *Advocacy planning* was developed in the 1960s to give voice to low-income and minority groups that were excluded from the rational planning process (Davidoff 1965). *Vision planning* gained popularity in the 1980s as a process to engage a community in defining a desired future and determining strategies and actions to achieve it (Okubo 2000).

These different strands of planning came together in the 1990s in a comprehensive planning methodology termed *values-driven planning* by the firm Wallace Roberts & Todd. Key characteristics of this methodology include a structured program of citizen and stakeholder involvement designed to identify shared community values and build consensus; data inventory and analysis focused on community-defined issues; articulation of a future vision based on the community values; and translation of the vision into specific policy directives and actions (Rouse 1998).

Values-driven planning and similar approaches have become the accepted norm for contemporary comprehensive planning practice. The substantive contents of the comprehensive plan have similarly evolved beyond the 20th century focus on physical development to address 21st century challenges. Key themes include sustainability, resilience, and equity.

Sustainability. The most commonly used definition of sustainability dates back to the Brundtland Report, which defines sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (World Commission on Environment and Development 1987). *Towards a Sustainable Seattle* (1994) was one of the first comprehensive plans to establish sustainability as an overarching goal for the future.

Resilience. Driven by the increasing frequency and severity of natural disasters, as well as events such as the Great Recession and the COVID-19 pandemic, resilience has emerged as a second major theme in 21st century comprehensive planning practice. Developed for The Rockefeller

Foundation's *100 Resilient Cities* initiative, the *City Resilience Index* defines resilience as "the capacity of cities to function, so that the people living and working in cities – particularly the poor and vulnerable – survive and thrive no matter what stresses or shocks they encounter" (Arup n.d.)

Equity. The APA defines equity as "just and fair inclusion into a society in which all can participate, prosper, and reach their full potential. Unlocking the promise of the nation by unleashing the promise in us all" (American Planning Association 2019). Most contemporary comprehensive plans identify equity as a goal or aspirational principle, one that has been difficult to realize in practice due to factors such as structural racism (to which planning practices such as Euclidean zoning have contributed) and increasing socioeconomic inequality.

Cutting across all three themes is the emergence of climate change as the existential environmental threat of the 21st century. New disciplines (for example, sustainability directors, chief resilience officers, and climate change officials) and plan types (for example, sustainability, climate action, and resilience plans) have been developed to address these interrelated themes and challenges. Nevertheless, the comprehensive plan stands alone as the long-range policy document that can set the direction for an integrated response at the local governmental level.

COMPREHENSIVE PLAN STANDARDS FOR SUSTAINING PLACES

The *Comprehensive Plan Standards for Sustaining Places* (Standards) are widely recognized as a benchmark for excellence in comprehensive planning practice. The Standards are a product of the Sustaining Places Initiative, launched by APA in 2010 to define the role of planning in addressing the sustainability of human settlement. As part of this initiative, APA established the Sustaining Places Task Force to explore how the comprehensive plan can help local communities achieve sustainable outcomes. The task force's work culminated in publication of the Planning Advisory Service (PAS) Report *Sustaining Places: The Role of the Comprehensive Plan* (Godschalk and Anderson 2012).

Following publication of the PAS Report, APA formed a working group to develop the Standards as a framework that local communities can use in creating new comprehensive plans and to evaluate existing plans against a national benchmark. The Standards are structured around six principles, two processes, and two attributes (Table 1). Best practices that communities should incorporate into their plans are identified for each of these ten components. The Standards are presented in a second PAS Report, *Sustaining Places: Best Practices for Comprehensive Plans* (Godschalk and Rouse 2015).

Table 1
Comprehensive Plan Standards for Sustaining Places: Principles, Processes, and Attributes

Principles	
Livable Built Environment	Ensure that all elements of the built environment, including land use, transportation, housing, energy, and infrastructure, work together to provide sustainable, green places for living, working, and recreation, with a high quality of life.
Harmony with Nature	Ensure that the contributions of natural resources to human well-being are explicitly recognized and valued and that maintaining their health is a primary objective.
Resilient Economy	Ensure that the community is prepared to deal with both positive and negative changes to its economic health and to initiate sustainable urban development and redevelopment strategies that foster green business growth and build reliance on local assets.
Interwoven Equity	Ensure fairness and equity in providing for the housing, services, health, safety, and livelihood needs of all citizens and groups.
Healthy Community	Ensure that public health needs are recognized and addressed through provisions for healthy foods, physical activity, access to recreation, health care, environmental justice, and safe neighborhoods.
Responsible Regionalism	Ensure that all local proposals account for, connect with, and support the plans of adjacent jurisdictions and the surrounding region.

Table 1
Comprehensive Plan Standards for Sustaining Places: Principles, Processes, and Attributes—continued

Processes	
Authentic Participation	Ensure that the planning process actively involves all segments of the community in analyzing issues, generating visions, developing plans, and monitoring outcomes.
Accountable Implementation	Ensure that responsibilities for carrying out the plan are clearly stated, along with metrics for evaluating progress in achieving desired outcomes.
Attributes	
Consistent Content	Ensure that the plan contains a consistent set of visions, goals, policies, objectives, and actions that are based on evidence about community conditions, major issues, and impacts.
Coordinated Characteristics	Ensure that the plan includes creative and innovative strategies and recommendations and coordinates them internally with each other, vertically with federal and state requirements, and horizontally with plans of adjacent jurisdictions.

Source: Godschalk and Rouse (2015).

The standards were developed based on a review of leading comprehensive plans and of literature addressing plan quality (for example, Berke and Godschalk 2009). As demonstrated by Table 1, they go beyond the original focus of the Sustaining Places Initiative on sustainability to provide an inclusive guide to the practice of comprehensive planning. Major areas addressed by the Standards include the planning process, the substance and characteristics of the plan that results from the process, and implementation.

Planning Process. The *Authentic Participation* best practices call for meaningful involvement of a diverse spectrum of community members, including representatives of disadvantaged and minority communities, in plan development and implementation. Leading contemporary plans emphasize community engagement and use increasingly sophisticated tools, such as online engagement platforms and scenario planning exercises, to involve the public in the planning process.

Plan Substance. The six principles listed in Table 1 are defined as “normative statements of intent that underlie a plan’s overall strategy, including its goals, objectives, policies, maps, and other content” (Godschalk and Rouse 2015, p. 15). As cross-cutting themes that transcend the traditional focus of the comprehensive plan on land use and physical development, they reveal how the substantive content of the comprehensive plan is changing in response to 21st century challenges related to sustainability, resilience, and equity.

Plan Characteristics. Best practices for *Consistent Content and Coordinated Characteristics* highlight the importance of effective communication in the design of the comprehensive plan and its presentation to the public. The default format of the 20th century comprehensive plan was a policy document organized into topical elements like land use, transportation, and community facilities. Contemporary plans are increasingly organized around themes that emerge from the planning process, integrate visual images and infographics to communicate information and ideas, and are presented using online and digital formats.

Implementation. In contrast to the typical 20th century comprehensive plan, which provided limited direction for implementation, the *Accountable Implementation* best practices call for the comprehensive plan to identify actions, timeframes, responsibilities, and metrics to measure progress in achieving desired outcomes. Robust implementation programs go beyond zoning and development regulations as the primary implementing actions to integrate capital investments, annual budget allocations, interdepartmental collaboration, and engagement of external partners.

The Standards reflect current trends in comprehensive planning and have proved influential in practice. Comprehensive plans for jurisdictions such as Asheville (North Carolina), Concord (Massachusetts), and Las Cruces (New Mexico) have used the Standards to structure plan content or, more broadly, as a benchmark in shaping the planning process, goals, and recommendations (Asheville 2018, Concord 2018, and Las Cruces 2020). Nevertheless, many contemporary comprehensive plans continue to be prepared using 20th century models and do not incorporate best practices from the Standards. For example, a survey of 48 local comprehensive plans in one state found that the majority of local plans do not contain goals or recommendations related to equity (*Interwoven Equity* principle) (Loh and Kim 2020). Few plans robustly address regional coordination and cooperation (*Responsible Regionalism* principle). While contemporary plans increasingly incorporate best practices for the *Accountable Implementation* principle, the extent to which these practices yield impactful, demonstrable results has not been established. Looking towards the future, comprehensive planning practice must accelerate adoption of the trends outlined above and take them in new directions in order to achieve truly sustainable, resilient, and equitable outcomes.

THE FUTURE OF THE COMPREHENSIVE PLAN

Climate change and natural disasters, technological innovation, and economic transformation, shifting demographics and increasing socioeconomic inequality – the pace of global change in the first two decades of the 21st century has arguably been faster than at any time in human history. The events of 2020 (COVID-19 pandemic, economic crisis, protests against structural racism, the most active Atlantic hurricane season on record, and more) highlight the disruptive effects of change and give new meaning to the term resilience. The comprehensive plan has a potentially vital role to play in enabling communities to prepare for and adapt to the disruptive effects of change in an uncertain world.

Figure 1 provides a framework for conceptualizing global trends that are driving or will drive change and the implications of these trends for local communities.² Drivers of change are divided into four interrelated categories: social, technological, economic, and environmental. Four drivers are identified for each of the categories (others could be added).

² This framework was developed by Benjamin Hitchings and the author (Hitchings and Rouse 2020).

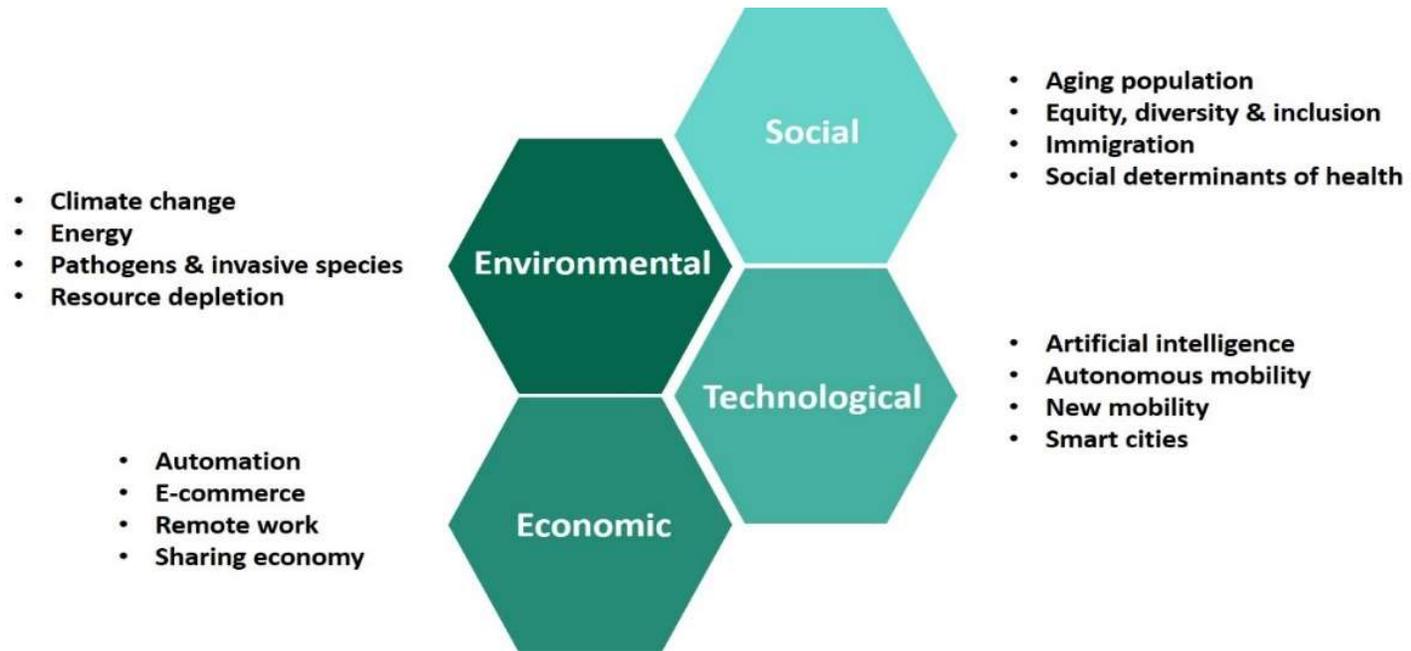


Figure 1. Drivers of Change
Source: Hitchings and Rouse (2020).

It is apparent that there are many interconnections between drivers of change within and across categories, for example: artificial intelligence, autonomous mobility, and automation; and equity, the social determinants of health, and climate change. These interconnections are illustrated by the effects of the COVID-19 pandemic, itself a recent manifestation of a driver (the global spread of pathogens and invasive species) that dates back to European colonization of the Americas. Literally overnight, the pandemic disrupted established patterns of living and working and accelerated the diffusion of technological and economic drivers such as e-commerce, remote work, and distance learning.³ The health and economic impacts of the pandemic revealed deep-seated vulnerabilities and inequities related to social drivers of change.⁴

The challenge for communities is to proactively prepare for the impacts of drivers of change, as opposed to the prevalent practice of reacting to them piecemeal as they arise (often precipitated by a crisis). Given its future-oriented perspective and role as the leading policy document of local governments, the comprehensive plan can provide a framework for communities to manage disruptive and transformational change. To do so, it must elevate three qualities that are not well developed in contemporary practice: foresight, systems thinking, and adaptability.

Foresight. Foresight can be defined as the act of predicting or anticipating what will or might happen in the future, an ability that has become increasingly difficult in a world of accelerating change and uncertainty. In comprehensive planning foresight typically takes the form of projections of future population, employment, and land use based on observed trends, an approach that does not account for effects of future change or disruptions caused by events such as economic shocks and pandemics. Exploratory scenario planning, which considers a range of possible futures and strategic responses, can be incorporated into the planning process to help communities prepare for uncertain future conditions (Marlow et al. 2015).

Systems thinking. The impacts of drivers of change cut across conventional plan elements (for example, land use and transportation) and issue areas that

³ For example, the McKinsey Global Institute estimated that the United States experienced the equivalent of 10 years of market penetration by e-commerce during the first three months of the pandemic (<https://www.mckinsey.com/business-functions/strategy-and-corporate-finance/our-insights/five-fifty-the-quickenning>).

⁴ Research demonstrates that obesity – a chronic disease related to the social determinants of health – increases the risk of severe illness from COVID-19 and that Hispanic and non-Hispanic Black adults have a higher prevalence of obesity and are more likely to suffer worse outcomes (<https://www.cdc.gov/obesity/data/obesity-and-covid-19.html>).

transcend the traditional focus of the comprehensive plan on physical development (for example, community health and resilience). From a systems-thinking perspective, a community is a complex system comprised of interacting subsystems, such as the natural and built environments, mobility networks, utilities, and social infrastructure. A systems approach to managing future change accounts for the interactions between systems and applies principles such as leverage points and feedback loops to influence system behavior to realize desired outcomes.

Adaptability. A typical comprehensive plan defines (1) a vision of what the community wants to be 20 or so years in the future and (2) steps to be taken in the short, medium, and long-term timeframes to achieve the vision. While providing an overall direction and framework for action, this linear model is ill-equipped to deal with the dynamics of change in an increasingly uncertain world. New, more flexible approaches are needed in plan development and implementation to enable communities to respond and adapt to the impacts of drivers such as climate change. For example, implementation approaches can draw on principles of adaptive management, anticipatory governance, and scenario planning in an ongoing process of monitoring and adjustment to inform decision-making.

With accelerating global change and uncertainty as the backdrop, the challenges and opportunities for the comprehensive plan of the future can be characterized in many ways. I identify six broad, interrelated themes – stated below as normative imperatives – to summarize how comprehensive planning practice can and must evolve to enable communities to seize the opportunities and overcome the challenges of the 21st century.

1. ***Equity:*** The comprehensive plan of the future must give voice to and provide for the needs of all community members.

A necessary component of foresight is understanding how the past is reflected in the present and will continue to influence the future. Given the nation’s legacy of racism and injustice for minority communities, and the historic role of planning in perpetuating exclusionary practices, this need is particularly pressing when it comes to equity. Inequality is deeply embedded in social, political, and economic systems. Addressing this legacy in the comprehensive plan begins by acknowledging the impacts of structural inequality in the inventory and analysis. Equity should be prioritized throughout the planning process; in the substance of the plan that results from the process; and in plan implementation to ensure that the needs of all community members are met.

Prioritizing equity in the planning process means ensuring that all community members have the opportunity to be heard throughout the process. It means moving up the spectrum of public participation from “inform” and “consult” to true collaboration and empowerment of previously excluded or underrepresented groups in decision-making (International Association of Public Participation n.d.). It means using novel approaches, such as gamification, participatory arts, and storytelling, to engage citizens. In the future, it will mean harnessing the increasing sophistication of online platforms and tools to make it affordable, convenient, and comfortable for all community members to participate, regardless of factors such as race, ethnicity, age, gender, or income.

Prioritizing equity in the substance of the plan means developing a vision, goals, and policies that account for all citizens and groups, particularly those who have not benefitted from the levels of access to opportunity enjoyed by more advantaged populations. It means directing strategy and action to improve conditions for poor, underserved, and minority populations who are disproportionately affected by polluting land uses, natural disasters, chronic diseases, and the like. And it means using system thinking to leverage synergies and connections across community systems, for example mobility options that increase access to affordable housing and decent jobs.

Prioritizing equity in implementation means breaking down systemic barriers and targeting action (regulations, investments, programs, etc.) to reduce or eliminate inequity. It means exploring new models (for example, participatory budgeting and capital programming) to meet the needs of groups that have historically received a lesser share of community resources. It means incorporating an equity lens into ongoing policy and decision making. And it means identifying and using metrics to track progress in meeting equity goals and targets.

2. **Climate change:** The comprehensive plan of the future must provide the framework for communities to address the existential threat posed by climate change.

Addressing the causes of climate change through *mitigation* (reducing or eliminating greenhouse gas emissions) and minimizing its effects through *adaptation* (increasing community resilience to climate-related impacts) are key environmental challenges of the 21st century. Climate change mitigation requires substantial emissions reductions at the global scale, which can reduce future climate risks and increase prospects for effective adaptation by local communities (IPCC 2014). Irrespective of the extent of future emission reductions, communities are currently experiencing climate change effects such as rising temperatures, extreme weather events, wildfires, and sea level rise,

impacts that are expected to increase in frequency and intensity for the foreseeable future.

Local communities have typically addressed climate change through functional plans, such as climate action plans and hazard mitigation plans.⁵ The comprehensive plan is the logical vehicle for a more holistic, integrated framework and strategies to mitigate and adapt to climate change across community systems, including land use and the built environment, natural and social ecosystems, transportation and infrastructure, and the economy.

Mitigation strategies should go beyond net-zero carbon emissions (a commonly used benchmark) to reduce the amount of carbon in the atmosphere through *climate-positive* planning and design. Typically applied to development projects or company operations, a climate-positive initiative determines the total carbon footprint, calculates emission reductions needed to achieve carbon neutrality, and sets an additional reduction target to remove more carbon from the atmosphere than is generated (Anzilotti 2018). The comprehensive plan can set the framework for achieving climate positivity at the communitywide scale. Examples of climate-positive strategies include energy efficient buildings, infrastructure, and use of renewable sources; waste reduction, recycling, and more efficient use of materials and resources; a transportation system that reduces reliance on fossil-fuel powered, single-occupancy vehicles; and tree plantings to remove and sequester carbon from the atmosphere.

Adaptation strategies should promote *climate resiliency* as a guiding principle for communities to anticipate, prepare for, and adapt to shocks and stresses caused by climate change. A climate-resilient approach identifies present and future risks associated with climate change (for example, urban heat islands and wildfires); identifies people and places within the community that are most vulnerable to those risks (for example, poor and minority communities and areas susceptible to flooding or sea level rise); and develops strategies to reduce risks before a disaster occurs and recover more quickly afterwards. Examples of climate-resilient strategies include land use and regulatory controls that limit development in vulnerable areas; nature-based solutions to absorb and reduce the impacts of extreme weather events; and siting and design of critical infrastructure systems to maintain functionality during natural and human-caused disasters.

⁵ Climate action plans typically address the reduction of greenhouse gas emissions by local municipalities. Hazard mitigation plans address the reduction or elimination of risks to people and property from future disasters.

Climate change is a prime example of the uncertainty associated with planning for 21st century drivers of change. As evidenced by Hurricane Harvey, the third so-called 500-year storm experienced by Houston in a three-year period, climate change has rendered standard engineering assumptions and practices for infrastructure obsolete – a phenomenon that has been termed “the death of stationarity” (Milly et al. 2008).⁶ Planning for climate change in a nonstationary world involves developing new, probabilistic models to estimate the range of possible impacts; determining options for responding to different impact scenarios to minimize harm; and using adaptive management approaches to monitor real-world outcomes and adjust responses accordingly. It also calls for reducing reliance on engineered infrastructure – which is subject to failure during increasingly severe and unpredictable weather events – and increasing community resilience through strategies such as developing multifunctional green infrastructure.

3. **Health:** The comprehensive plan of the future must promote community health and well-being by holistically addressing the social determinants of health.

The World Health Organization defines health as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity” (World Health Organization 1946). In 2018 only 2.9% of U.S. healthcare spending was devoted to health promotion and disease prevention rather than treatment of people after they become sick.⁷ Despite spending far more per capita on healthcare than any other wealthy nation, the U.S. ranked 35th in the world in life expectancy in 2019.⁸

The public health profession developed the concept of the social determinants of health – the conditions in which people are born, grow, live, work, and age – to describe the factors that influence health status and outcomes (Figure 2). It is evident from Figure 2 that healthcare is but one determinant of individual and community health. It is also evident that planners have an important role to play in maximizing the contributions of other determinants (for example, housing, transportation, and food access) to improved health and well-being.

⁶ Stationarity is the idea that natural systems fluctuate within an unchanging envelope of variability (Milly et al. 2008).

⁷ Retrieved from <https://www.healthsystemtracker.org/chart-collection/what-do-we-know-about-spending-related-to-public-health-in-the-u-s-and-comparable-countries/#item-start>.

⁸ Retrieved from <https://www.infoplease.com/world/health-and-social-statistics/life-expectancy-countries>.

The city planning, landscape architecture, and public health professions share common historic roots, and “public health, safety, and welfare” is the legal justification for zoning. However, the relationship between planning and public health was largely forgotten as 20th century comprehensive planning practice focused on land use and physical development without considering ancillary health impacts. The 21st century has witnessed a resurgence of interest in this relationship, particularly as it pertains to the influences of the built environment on health. The social determinants provide a useful frame of reference for conceptualizing how the full range of community systems (natural, built environment, social, and economic) and subsystems interact to shape individual and community health. The comprehensive plan is the logical vehicle for an integrated framework and strategies that leverage these interactions to achieve the overarching goal of a healthy community. Examples include policies and actions that promote physical activity through design of the built environment; link physical design to social programs and support to encourage healthy lifestyles; increase economic opportunity and provide convenient, affordable transportation access between housing and jobs; improve environmental health; and integrate natural and built systems to allow all people to experience the health benefits of contact with nature.

As demonstrated by data revealing stark differences in life expectancy between zip codes in cities across the nation, as well as the disproportionate impacts of COVID-19 on communities of color, health inequity is a critical challenge that requires a sustained, coordinated effort to address. Cross-sectoral collaboration with public health professionals, social support providers, and others who work with the social determinants of health during comprehensive plan development and implementation is key to meeting this challenge. Digital health data (anonymized to protect privacy) can be used to provide a baseline of community health conditions, identify disparities between different neighborhoods and populations, and track progress in improving health equity over time. The COVID-19 pandemic spurred the development of technological applications using predictive analytics and artificial intelligence to identify vulnerable populations and forecast future surges, innovations that can be adapted for comprehensive planning purposes.

Social Determinants of Health

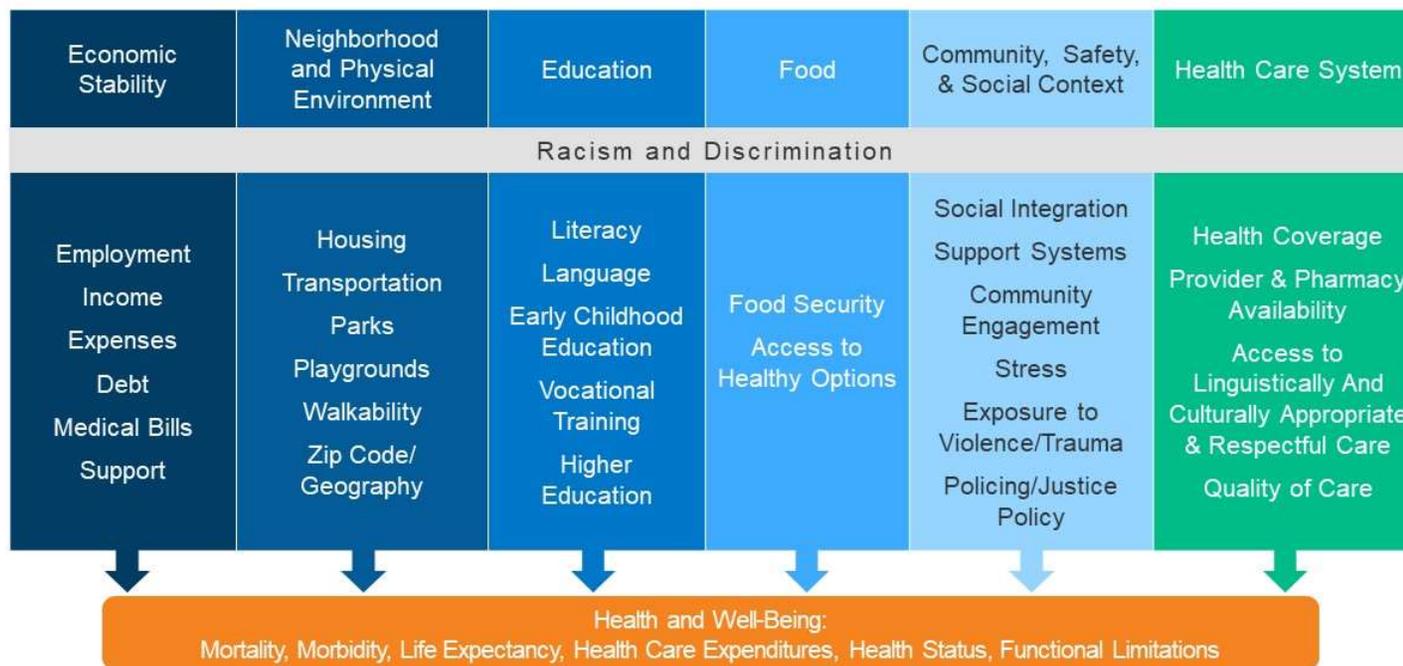


Figure 2

Social Determinants of Health

Source: Artiga and Hinton (2018), reproduced with permission from the Kaiser Family Foundation.

4. **Nature:** The comprehensive plan of the future must advance the principle of harmony with nature by integrating the natural and built environments.

Human impacts on biodiversity and natural resources constitute a second environmental crisis of the 21st century that both contributes to and is magnified by climate change. According to a global assessment, the rate of decline in biodiversity and associated ecosystem services provided by nature is unprecedented: up to one million of the estimated eight million plant and animal species on Earth are at risk of extinction, many of them within decades (IPBES 2019). Natural resource depletion is a global trend driven by population growth, consumer demand, and basic human needs such as food and water. Its effect be seen in the impacts of raw material extraction on landscapes and water supplies, water shortages and inequitable access to safe drinking water, and unsustainable farming and fishing practices.

In the classic environmental worldview, nature (as epitomized by pristine national parks and wilderness areas) is perceived as separate and apart from cities and the built environment. In the 21st century, human impacts on climate, natural landscapes, and ecosystems have rendered this worldview obsolete.⁹ A new paradigm is needed: one that recognizes that humans are part of nature, that natural and human systems are inextricably connected, and that addressing 21st century environmental challenges must go beyond protecting “natural” areas to integrate the natural and built environments for the benefit of people and other species. Three complementary approaches can be used to realize this paradigm shift:

1. Preserve and maintain the functionality of remaining natural ecosystems.
2. Drawing on the science and practice of ecological restoration, restore the functionality of ecosystems that have been damaged by human activities.
3. Improve the functionality of urban ecosystems by integrating green infrastructure into the built environment.

⁹ This idea was first articulated for a general audience by Bill McKibben in *The End of Nature* (McKibben 1988).

These three approaches share the common purpose of maintaining and improving the benefits provided by natural systems and processes, which are referred to as ecosystem services.¹⁰

In the comprehensive plan, the concept of *green infrastructure* can be used as an organizing construct for policy and action to integrate the natural and built environments. Two definitions of green infrastructure are in common usage: 1) a large-scale, strategically planned network of natural lands and resources (Benedict and McMahon 2006), and 2) stormwater management practices that use or mimic natural processes to capture runoff near where it is generated (U.S. Environmental Protection Agency n.d.). These definitions form a continuum across scales, unified by the multifunctional (environmental, economic, and social) benefits provided by green infrastructure for people and ecosystems (Rouse and Bunster-Ossa 2013). Components of a green infrastructure network can include, among others, natural areas, forests, and farmlands; parks, natural areas, and riparian corridors; tree canopy cover in urban and suburban settings; and local features such as green streets, green roofs, and backyard habitat.

The comprehensive plan can specify a range of established and emerging applications to create a communitywide, multi-functional green infrastructure network. Regulations, incentives, and capital investments that preserve existing green spaces and environmentally sensitive areas are an example of the former. Replacing conventional, high-maintenance landscape practices with ecological design of public and private properties to create healthy, functioning plant communities is an example of the latter (Beck 2013). Another is to develop policies and management practices for novel plant communities – the mix of species, mostly non-native, that occur spontaneously in neglected urban spaces – to enhance ecosystem services and eliminate invasive species.

Research has repeatedly demonstrated that low-income and minority communities have less access than more affluent populations to parks, tree canopy, and other green resources, despite the potential benefits such resources provide (Rigolon 2013). These benefits include, among others, better air and water quality; improved health outcomes; enhanced aesthetics and safety; increased food security; and new job and business opportunities, such as constructing and maintaining green stormwater infrastructure (Dunn 2010). Therefore, comprehensive plan policies and actions to create a green

¹⁰ Ecosystem services can be grouped into four categories: provisioning services such as food, water, and fiber; regulating services such as climate regulation, flood control, and water quality treatment; cultural services such as recreation, aesthetic enjoyment, and spiritual fulfillment; and supporting services such as soil formation, pollination, and nutrient cycling (Millennium Ecosystem Assessment 2005).

infrastructure network should prioritize equity for underserved communities as a guiding principle.

5. **Technology:** The comprehensive plan of the future must harness technology to serve people, communities, and ecosystems.

New technologies – defined broadly as tools, techniques, and processes used to achieve human goals – have transformed societies throughout history, from the agrarian and industrial revolutions to the emergence of personal computers and the Internet in the late 20th century. The pace of technological change is accelerating in the 21st century. Driven by developments such as artificial intelligence, automation, and the Internet of Things (IoT, the foundation of smart city technology), this era has been called the Fourth Industrial Revolution (Klauss 2016).

Digital technology is transforming comprehensive planning practice. Its effects are most evident in the planning process and in the format and presentation of the comprehensive plan itself. The planning process has seen increased application of online and virtual engagement techniques, with the use of remote meeting technology having become more pronounced during the COVID-19 pandemic. Plan formats are shifting from traditional reports (and their digital equivalent, the pdf document) to web-based platforms that are easily navigated by users. The digital divide is a significant barrier to participation by those lacking ready access to or uncomfortable with computers and the Internet. My perhaps optimistic assumption is that this barrier will diminish in the future as digital technology becomes more widely accessible (if not ubiquitous) and younger generations accustomed to using this technology mature.

The use of digital technology is less evident in the substantive contents of the comprehensive plan and in plan implementation. While contemporary plans are more often addressing emerging technologies such as new mobility and smart cities in plan policies, they are not yet tapping the potential of technological advancements such as increasing computing power, big data, and the Internet of Things to inform policy development and turn policy into action.

The rate of technological change makes it impossible to predict the future effects on local communities (and on comprehensive planning practice) with any degree of certainty. It is clear, however, that planning that incorporates the three qualities identified above – foresight, systems thinking, and adaptability – can help communities prepare for and adapt to the disruptive impacts of that change. Too often, the focus is on the latest and most advanced technological applications rather than on whether and how those applications truly serve societal, environmental, or community needs. The comprehensive plan of the

future can help guide the use of technology to support community values and achieve more sustainable, resilient, and equitable outcomes.

The use of technology to help realize community goals is embodied in the concept of *smart cities*. The Smart Cities Council defines a smart city as one that uses information and communications technology to collect, communicate, and analyze data in order to “enhance its livability, workability, and sustainability” (Smart Cities Council n.d.). According to the American Planning Association, a smart city “equitably integrates technology, community, and nature to enhance its livability, sustainability, and resilience, while fostering innovation, collaboration, and participatory co-creation” (Hurtado, Hitchings, and Rouse 2021).

Current smart city applications are being used to 1) promote citizen engagement with municipal government and 2) yield more sustainable and efficient outcomes in performance domains such as transportation, energy, water, and public health (Hurtado, Hitchings, and Rouse 2021). Typically, these applications are being developed by different departments or agencies independent of comprehensive or other planning processes.

First and foremost, integrating technology into the comprehensive plan of the future means using it to empower citizens to define goals, priorities, and implementing actions through the planning process (referred to as participatory co-creation in the APA smart city definition).¹¹ Smart city applications can be used to help realize community goals and priorities, for example by measuring current conditions, setting targets for improvement, and monitoring implementation progress. An example might be the use of technologies such as high-resolution remote sensing and cyberGIS, IoT sensor networks, and artificial intelligence to maximize the multi-functional benefits provided by green infrastructure in accordance with direction set by community engagement in the planning process. This example draws on an emerging concept for the integration of nature and technology in the built environment called the *Internet of Nature*. In this concept, urban ecosystem components and interrelationship dynamics are described and represented through digital technologies and applications, and information and data obtained from the digital representation of these urban ecosystems can be used to inform design, planning, and management decisions (Gallè, Nitoslowski, and Pilla 2019).

¹¹ *Decidim Barcelona*, an online platform launched in 2016 by Barcelona, Spain, is an example of participatory co-creation. *Decidim Barcelona* enables citizens to suggest and debate ideas and participate in decision making, thus shaping future policies (van den Bosch 2018).

From a systems perspective, green infrastructure is one of many interacting subsystems that comprise a community and the Internet of Nature is a manifestation of a broader concept referred to as a *smart city digital twin*. A smart city digital twin is a living digital replica of a city that is continuously updated with real-time data and analytics on interactions between humans, infrastructure, and technology (Mohammadi and Taylor 2020). According to Arup, a smart city digital twin has the potential to “help provide a simulation environment, test policy options, bring out dependencies, and allow for collaboration across policy areas, whilst improving engagement with citizens and communities” (Arup 2019). Enabled by the increasing power and sophistication of digital technology, the comprehensive plan of the future can provide a vehicle for realizing this potential.

6. **Implementation:** The comprehensive plan of the future must develop new approaches and tools to translate community goals into measurable results through implementation.

The real-world impacts of a comprehensive plan are determined by the extent to which it is implemented. Despite this basic truth, implementation is typically the weakest section of contemporary comprehensive plans, characterized by either a lack of implementation specifics (too little detail) or lengthy lists of policies and actions with limited guidance on how to implement them (too much). Moreover, limited research has been conducted to determine the effectiveness of implementation programs in the years following plan adoption.

Successful implementation is a multidimensional process that encompasses a synergistic range of activities, participants, and relationships. The *Levels of Implementation* model shown in Figure 3 is a useful way to characterize approaches to plan implementation in contemporary practice.¹² With community engagement in plan development and (ideally) implementation as the foundation, these levels are arranged by approximate order of degree of difficulty from 1 (regulations) to 4 (external partnerships).

Zoning and development regulations (Level 1) have traditionally been the primary mechanisms used to implement the comprehensive plan. While regulatory changes are important for successful plan implementation (particularly in communities with strong development markets), they are not by themselves sufficient to realize desired plan outcomes. In an era of increasing change and

¹² This model was developed by the author and Garner Stoll, former City of Austin Deputy Planning Director and project manager of the *Imagine Austin* Comprehensive Plan and presented in a session at the 2013 National Planning Conference in Chicago.

uncertainty, new regulatory approaches that incorporate flexibility to anticipate and adapt to changing conditions are needed to supersede rigid and outdated 20th century practices. Examples include 1) flexible land use systems to replace Euclidean zoning and 2) adaptive infrastructure standards that account for the range of potential impacts of climate change to replace conventional engineering specifications.

Public investment, including capital projects, programs, and budgetary allocations (Level 2) is a second key mechanism to implement the comprehensive plan. Successful implementation depends upon directing these investments to advance comprehensive plan goals and achieve equitable, resilient, and sustainable outcomes. For example, capital improvement programming should use an equity lens to address past discriminatory patterns of public investment and prioritize improvements in underserved areas based on community-defined needs. Green municipal bonds and other emerging financial instruments can be used to raise capital to achieve environmental goals such as climate change mitigation and adaptation.

Organizational alignment (Level 3) refers to coordinating work programs and decisions by the municipal administration and departments towards the common purpose of implementing the comprehensive plan. Such alignment is difficult to accomplish in practice because of the siloed nature of municipal government (a common trait of organizations comprised of functional units with separate missions and work programs). Successful examples in contemporary practice generally stem from strong leadership by the municipal administration and elected officials. To be sustainable over the long term, organizational alignment requires cultural change that recognizes interconnections and interdependencies between different functions of municipal government (systems thinking), accompanied by a shift to collaborative and synergistic ways of working across departments to accomplish shared goals.

External partnerships (Level 4) are potentially the most transformative but are currently the least developed of the four levels of implementation. Present-day plans typically identify partnerships on a case-by-case basis for individual actions and programs. A more integrated approach would establish a structure for ongoing, cross-sectoral collaboration to implement the comprehensive plan, for example a coalition of public, private, nonprofit, and civic partners to coordinate resources to implement plan priorities. No good examples of this approach exist in contemporary practice, indicating the need for new governance models to implement the comprehensive plan of the future.

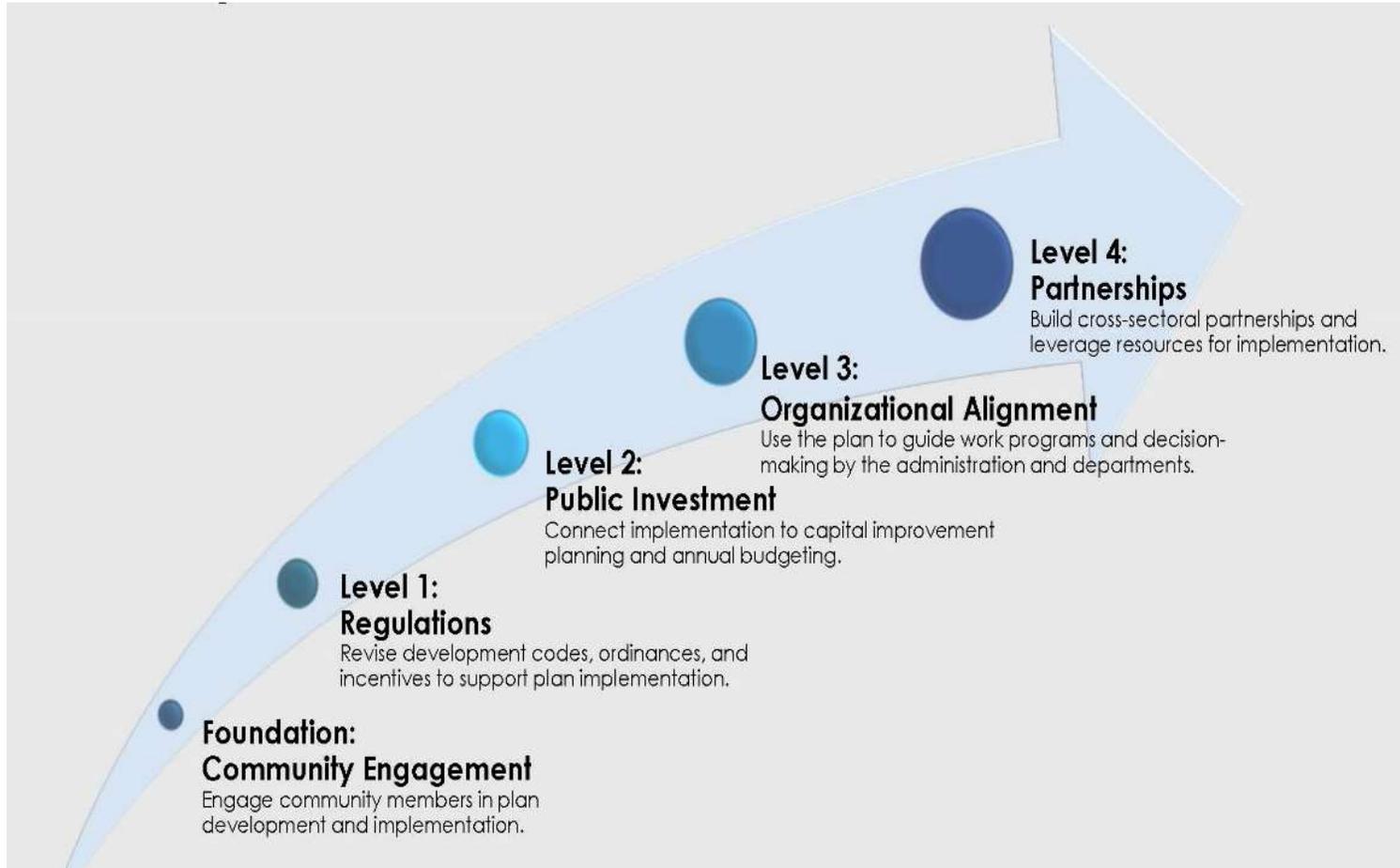


Figure 3
Levels of Implementation Model
Source: Author.

Successful future implementation programs will integrate the four levels described above, while introducing new approaches, systems, and tools to realize community-defined goals and priorities. The public should continue to be engaged in implementation activities, progress reviews, and plan updates throughout the plan implementation process. An organizational structure such as a comprehensive plan implementation committee (used by some New England municipalities) can be established as a conduit for ongoing community engagement.

Comprehensive plan implementation sections are often organized around a table that divides actions into timeframes (short, medium, and long-term), accompanied by information such as responsible departments or agencies, external partners, and potential funding sources. A key limitation of this approach is that it does not adequately account for future change. Successful implementation is an iterative process that involves ongoing monitoring, review, and adjustment as conditions change. The uncertainty created by 21st century drivers of change will make this process ever more challenging in the future.

Addressing the limitations of the traditional linear approach to implementation (in which actions are checked off a list before moving to the next) requires integration (that is, simultaneous consideration) of short, medium, and long-term time horizons (Webb 2019). In the short term, where certainty is the greatest, the focus is on tactics (for example, regulatory changes, investments, and partnerships) to catalyze desired system change. In the more uncertain medium term, the focus shifts to strategies to achieve plan goals. The long-term focus is on strategic directions set by the plan vision, as well as on anticipating and preparing for drivers of change.

Autonomous vehicles (AVs), whose potential effects on transportation and land use have been termed potentially the most transformative since mass production of the private automobile in the early 20th century (Chapin et al. 2016), provide an example of how this approach might be applied. While the ultimate timeframe for widespread adoption of AVs is uncertain and will likely be measured in decades, many pilot applications (for example, shuttles) are under development and will be deployed in a matter of years. An example of a short-term tactical intervention might be to reduce parking requirements and investments in anticipation of reduced demand from shuttle connections to transit and (ultimately) from widespread deployment of AVs. An example of a mid-term strategy might be to develop policies and incentives to promote a fleet-operated, shared-ride model and disincentivize individually owned, single (or zero) occupancy AVs. Addressing the long-term time horizon might involve monitoring the development of AV technology, projections for future deployment, and implications for the plan vision and goals. Exploratory scenario planning could be used to inform the development of mid-term strategy and short-term tactics.

CONCLUSION

The above themes are not intended to be exhaustive. Rather, they illustrate the potential of the comprehensive plan to serve as a vehicle for communities to bring about desired change. Other themes or topics could be explored: for example, how plan characteristics will evolve to take advantage of increasingly sophisticated web-based formats and communications and engagement techniques, and in so doing integrate the planning process, the final plan that results from the process, and implementation.

At its best, comprehensive planning can exemplify democratic engagement in charting a community's course for the future during a time of increasing divisiveness at higher levels of government. This local focus is both a strength and a limitation to addressing big 21st century challenges such as climate change, technological disruption, and socioeconomic inequality. On the one hand, consider the potential impacts if thousands of communities across the United States were to prepare and maintain a new generation of comprehensive plans incorporating themes and directions like those explored above. On the other, these impacts must be scaled up from the local jurisdictional level to result in truly transformational change. This process can begin with new governance models that coordinate and align comprehensive planning and implementation by local jurisdictions at the regional level.¹³ As metropolitan regions expand, there is growing awareness of the need for coordinated planning at the megaregional scale to address environmental, transportation, and other issues that transcend individual regions (Barnett 2020). Moving up in scale, state and federal policies and investments have a powerful influence on the effectiveness of planning and implementation at the regional and local levels.

As the official long-range policy document of local governments, the comprehensive plan is uniquely positioned to help communities achieve sustainable, resilient, and equitable outcomes. However, this potential has not been fulfilled in practice. The success of the comprehensive plan of the future will be measured by the extent to which potential becomes reality and the impacts are amplified to bring about transformational change at the global scale.

Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed, it is the only thing that ever has.

Margaret Mead

¹³ For example, the Metropolitan Council for the seven-county Minneapolis-St. Paul region has developed a review process for coordinating local and regional planning among the region's municipalities and counties. The process includes regular cycles of regional plan updates followed by assistance to localities for local plan updates (Metropolitan Council n.d.).

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