

2023

APA FORESIGHT

Trend Report for Planners

Use the future to create great communities for all and stay a step ahead of the issues impacting planners' work—and our communities. Brought to you by the American Planning Association and the Lincoln Institute of Land Policy.

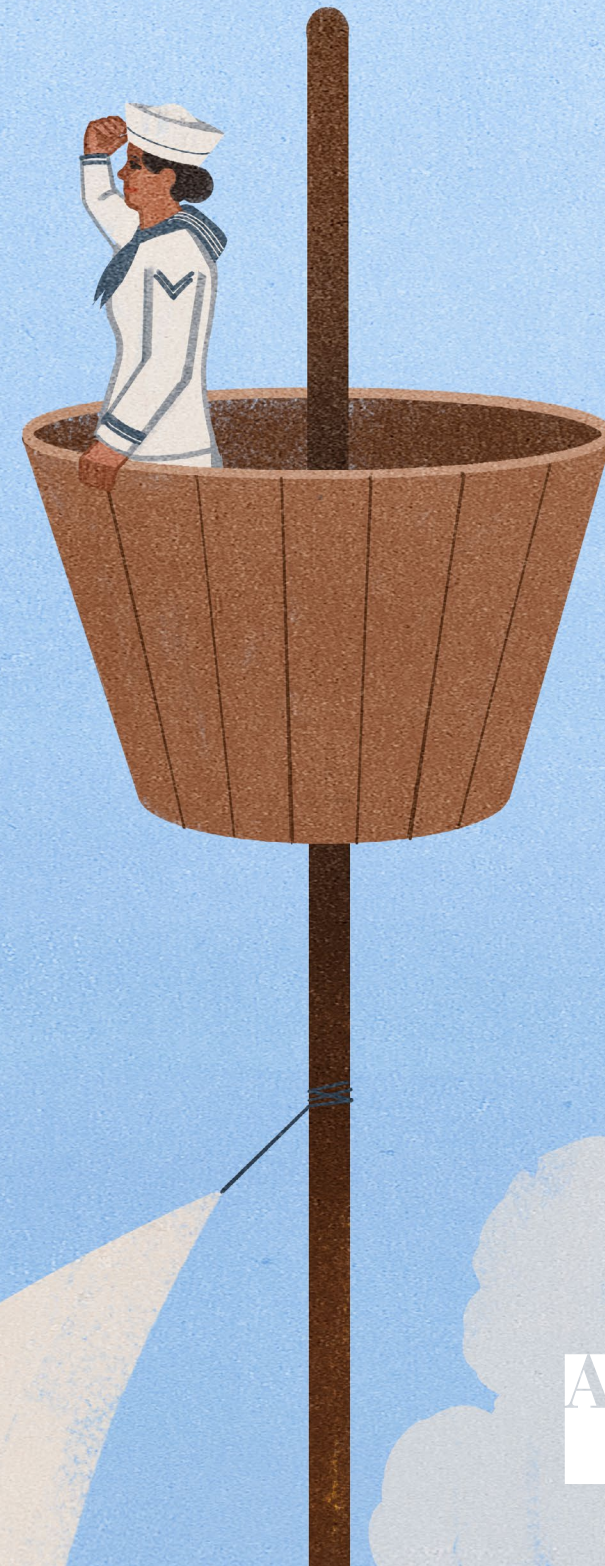


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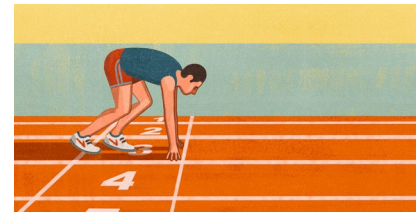
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Trends and Signals for 2023

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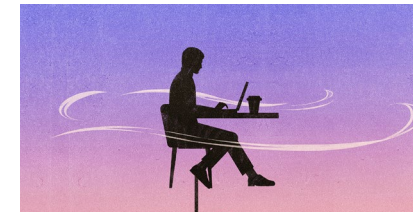
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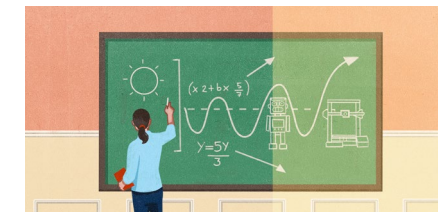
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SCENARIOS 2030:

The Futures of [Smart Cities and Climate Action](#)

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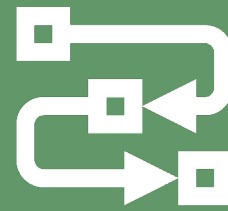
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The framework



**About
This Report**



Methodology



**Trend
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About this Report

This is the second Trend Report for Planners developed by the American Planning Association (APA) in partnership with the Lincoln Institute of Land Policy. Like last year, the core of this trend report is a list of over 100 existing, emerging, and potential future trends that the APA Foresight team, together with our Trend Scouting Foresight Community, identified as relevant to planning. The trends are structured within three timeframes (Act Now, Prepare, Learn and Watch), which indicate the urgency of planners' action. Within each timeframe, trends are grouped into themed clusters. For each trend, the report gives insights and explains why it is important for planners to know about and consider the trend in their work.

In this second foresight cycle, we included experts and thought leaders from multiple disciplines, industries, backgrounds, and countries in our [Trend Scouting Foresight Community](#) to gain more diverse perspectives on the shifts we see around us and to include a variety of potential futures in our work. In addition to planners from different planning fields, we worked with engineers, architects, anthropologists, computer scientists, psychologists, sociologists, and public health professionals, among others. This is the next step in the evolution of our foresight practice: to imagine futures beyond the views and perspectives within the planning profession, challenging the continuation of our past and present.

While most of the trends and signals from the [2022 Trend Report for Planners](#) are still relevant, we didn't repeat them in this

trend report unless there were major updates that were important to highlight. Many of last year's emerging trends moved from the Prepare timeframe to the Act Now timeframe. And some of the signals we have been watching moved from the Learn and Watch timeframe to the Prepare timeframe. All trends and signals from this and last year's trend report are now also available online in [APA's Trend Universe](#) where they will be regularly updated, reflecting the accelerating pace of change of today and tomorrow.

Additionally, the report describes "trend patterns," which explore the bigger-picture developments rooted in the variety of trends observed and how they affect planning. The report also addresses the future of planning, explaining how the planning profession will have to evolve to keep up with a continuously changing world, what

new skills planners will have to develop, and which new tools are worth trying.

This year, we also included some new features to help you make sense of a changing world and how you can tackle the myriad trends and related future uncertainties.

We added some **deep dives** on existing trends planners should know about. A deeper understanding of them seems crucial to the healthy and thriving future of our communities. This includes the biodiversity crisis and related mass extinction and rewilding, urban heat and related challenges and solutions, and artificial intelligence and the opportunities it provides and the risks it poses.

In the Prepare timeframe, we included sets of **questions you can use as a first step to prepare for** emerging trends around the future of work, and what to do about the hype around the metaverse and

blockchain, crypto, and NFTs, among others.

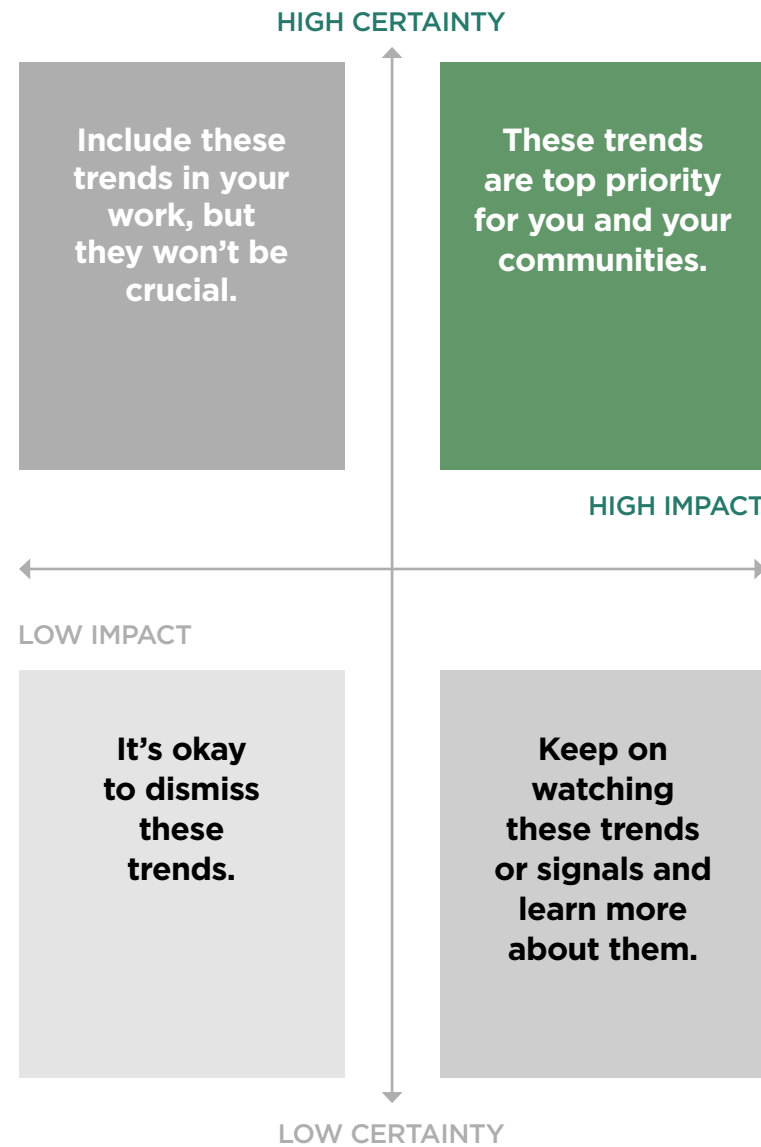
Throughout the report, we did some time travel and created a variety of **future scenarios** based on different trends and signals. These scenarios are examples for how planners can use the trends from this report to create multiple plausible futures of their own communities and how they might affect the path forward. We looked at the year 2030 and potential futures related to smart cities and their connection to climate action. We traveled to the year 2040 to better understand how the metaverse might affect the planning profession in the future. And we explored plausible scenarios for the year 2050 on how the future of agriculture and food production together with the future of work may change how we think about land use. For more information on scenario planning, you can visit [APA's Scenario Planning Knowledgebase Collection](#).

How to use this report

The trend report is intended to be used as a tool or reference when planning for the future of your communities. Planners can use the trends listed in this report as input for their long-range and current planning processes, to practice strategic foresight during [community visioning](#) processes, for [scenario planning](#), or simply to inform future decision-making.

To determine and prioritize the most important trends to consider, planners can evaluate and rate the trends based upon (1) the expected extent and severity of the potential impact and (2) how certain or uncertain it is that a trend will occur in a community. The prioritization graph demonstrates how these two factors interact in the evaluation of trends. Trends in the upper right quadrant of the graph—high impact and high certainty—represent the top priority trends planners should pay special attention to.

Trend Prioritization for Planners



In addition to APA's *PAS QuickNotes* 94, "[Planning With Foresight](#)," which briefly describes how you can use the multiple trends of this report in a foresighted approach, we developed an interactive online course on how you can make sense of the future, train your futures literacy muscles, and use foresight in your work: [Using the Future to Create Dynamic Plans](#). The course offers approaches on how you can identify trends and signals in your community together with community members, how you can prioritize and focus on the most important trends, how you can imagine what the future might look like, and how the practice of foresight can help you create dynamic plans that allow you to pivot along the way while the future is approaching. Using the future when trying to shape the future of our communities will result in more equitable and resilient outcomes.

About the American Planning Association

The [American Planning Association](#) is an independent, not-for-profit educational organization that provides vital leadership in creating great communities for all. APA and its professional institute, the [American Institute of Certified Planners](#), are dedicated to advancing the profession of planning, offering better choices for where and how people work and live. The nearly 40,000 APA members work in concert with community residents, civic

leaders, and business interests to create communities that enrich people's lives. Through its philanthropic work, the [APA Foundation](#) helps to reduce economic and social barriers to good planning. APA is based in Washington, D.C., and Chicago.

APA Foresight— learning with the future

[APA Foresight](#) helps planners navigate change and prepare for an uncertain future. With foresight in mind, planners can guide change, create more sustainable and equitable outcomes, and establish themselves as critical to thriving communities. Foresight is not about

predicting the future—it is about understanding drivers of change that are outside of our control, how we can prepare for them, and when it is time to act. APA Foresight identifies emerging trends and explores how scenarios stemming from each may impact the world, our communities, and the planning profession in the years to come. The path forward requires adjusting, adapting, and even reinventing planning processes, tools, and skills to meet the needs of a changing world. Through APA's foresight practice, planners will find support, training, and new research for making sense of the ever-changing future.



American Planning Association
Creating Great Communities for All



CONSORTIUM FOR
SCENARIO PLANNING



LINCOLN INSTITUTE
OF LAND POLICY

About the Lincoln Institute of Land Policy

The [Lincoln Institute of Land Policy](#) seeks to improve quality of life through the effective use, taxation, and stewardship of land. A nonprofit private operating foundation whose origins date to 1946, the Lincoln Institute researches and recommends creative approaches to land as a solution to economic, social, and environmental challenges. Through education, training, publications, and events, the Lincoln Institute integrates theory and practice to inform

public policy decisions worldwide and organizes its work around the achievement of six goals: low-carbon, climate-resilient communities and regions; efficient and equitable tax systems; reduced poverty and spatial inequality; fiscally healthy communities and regions; sustainably managed land and water resources; and functional land markets and reduced informality.

Consortium for Scenario Planning

The [Consortium for Scenario Planning](#) at the Lincoln Institute of Land Policy offers a community of practice for practitioners, including access to technical assistance,

educational resources, and a network of fellow innovators. Its mission is to improve the practice of scenario planning and broaden its use in communities of all sizes across disciplines. This community of practice helps to foster growth in the use of scenario planning at all scales. Through research, peer-to-peer learning, networking, training, and technical assistance, we help communities develop better plans to guide a range of actions, from climate change adaptation to transportation investment. In addition to planners, the Consortium also convenes researchers and software providers to develop more effective tools and reduce barriers to entry.

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Methodology

Foresight Methodologies

TREND SCANNING

Researching existing, emerging, and potential future trends (including societal, technological, environmental, economic, and political trends, or STEEP) and related drivers of change.

SIGNAL SENSING

Identifying developments in the far future and in adjacent fields outside of the conventional planning space that might impact planning.

FORECASTING

Estimating future trends.

SENSE-MAKING

Connecting trends and signals to planning to explore how they will impact cities, communities, and the way planners do their work.

Source: PAS QuickNotes 94, "Planning with Foresight."

Trend Timeframes

Identified trends are grouped depending on their urgency:

ACT NOW

Existing trends planners need to act on today.

PREPARE

Emerging trends planners need to prepare for.

LEARN AND WATCH

Potential future trends or signals planners need to learn more about and keep watching.

Five Trend Categories

Five trend categories are at the foundation of APA's foresight research: societal, technological, environmental, economic, and political trends (STEEP). Through these five categories, APA connects emerging trends and potential future trends to planning (sense-making) and creates guidance on how planners can get future-ready (meaning-making).



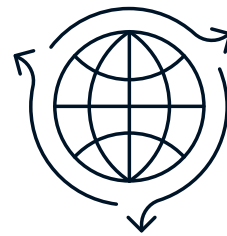
Trend Scouting Foresight Community

For a successful foresight practice, team diversity is crucial. To capture diverse perspectives, ensure that we identify a variety of trends directly or indirectly connected to planning, and avoid missing trends or signals within or outside the planning world, this year we added thought leaders from many different backgrounds, countries, and disciplines to our [Trend Scouting Foresight Community](#). This next step in the evolution of our foresight practice helped us to imagine futures beyond the views and perspectives within the planning profession, challenging the continuation of dominant narratives. The members of the Trend Scouting Foresight Community meet quarterly to share observations, discuss occurring shifts they have observed, and hint at signals that could evolve into future trends.

Trend Patterns

One year after the publication of our first trend report, much of the world is still upside down because of long-lasting impacts from the COVID-19 pandemic. And while many trends have either accelerated or shifted directions, today, we encounter many of the same challenges and problems we had already tried to solve before the pandemic. A variety of solutions are available. Now is the time for planners to act on those that can already be implemented today and prepare for and learn more about those that are emerging or could potentially make a difference in the future.

The COVID-19 aftermath



The COVID-19 pandemic seems to be slowing down. Almost three years later, we are left with over six million COVID deaths worldwide, persisting disruption in almost everything we do, and increased uncertainty about what

the future will look like. The aftermath is visible at all scales.

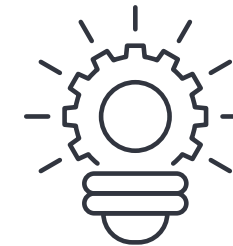
While COVID has had many negative and worrisome impacts, it also forced some positive shifts. The remaining questions for the coming months (and maybe years) will be: what changes are here to stay and should be made permanent? What are the things that used to be better pre-COVID? And what needs to be completely rethought due to lessons learned during the pandemic or even before?

Many of the trends and signals in this trend report will relate to these questions. Changes in how we do our work have the potential to completely redefine what the future of work may look like. Meanwhile, the long-lasting effects of COVID on young generations (masking, distance learning, etc.) as well as elderly people (isolation) are still unknown.

The pandemic was also a reminder for us that the world is more tightly connected than ever before, something that has become even more visible since the war in Ukraine started. Global supply chain issues, a disrupted economy, food supply challenges, and inflation are just a few related impacts.

Previously global solutions are now being sought on national or local levels. Manufacturing making its way back to the U.S. is one result. Interestingly, some of the COVID-induced growth patterns in the tech sector and in e-commerce seem to have slowed down last year, creating more uncertainty about the direction of the economy over the coming months and years.

Old problems need new solutions



As planners we deal with a number of wicked problems: climate change, the housing crisis, and many other challenges. And while current uncertainties may paint a rather pessimistic picture of what the future may look

like, we do need to point out the many positive developments on the horizon as well. Regardless of the direction of particular trends and developments, it is important for planners to start looking outside of the box, challenge our traditional assumptions, and stop trying to solve the same problems with the tools that initially created them. The potential and opportunities to leverage technological and social innovations in our work have never been as promising as they are today.

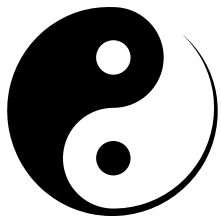
Innovative solutions that support co-creation and more inclusive participation can help us to listen more and better understand the most vulnerable and their needs. Youth movements should be seen as a wake-up call instead of a nuisance

and remind us of our responsibility toward future generations.

Technological innovations such as 3D-printed homes and social concepts such as co-living and intergenerational living provide potential solutions for the housing crisis we shouldn't dismiss. Policies that allow for their implementation instead of those that impose restrictions will be needed.

Furthermore, an enormous amount of funding and support from the federal government to combat and adapt to climate change is available right now. And the list of emerging transportation systems and programs that can make transportation more equitable and environmentally responsible is long. This is the time to offer implementation opportunities instead of putting barriers in the way. The number of young people getting driver's licenses is declining, as they prefer walking, biking, and riding scooters over driving. However, billions of dollars are still being provided to maintain infrastructure that was built for cars while laws and regulations are being put into place that keep scooters off our streets.

A natural balance of everything?



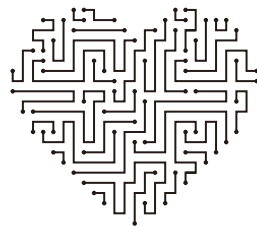
Some trends listed in this report might seem like new challenges for which we need to find solutions. However, looking at the bigger-picture trend patterns holistically, many of them become new opportunities. For exam-

ple, trends such as the automation of work (blue-collar jobs as well as white-collar jobs) might generate fears about future mass unemployment. However, signals related to the future of work, such as the renewed focus on a healthy work-life balance,

four-day work-week pilots, and new expectations of younger generations regarding meaningful tasks in entry-level jobs, might align well with these trends.

The digitalization of everything, including increased applications of artificial intelligence (AI), poses the risk to exacerbate social inequalities. However, available funding to close the digital divide can make digitalization more inclusive. If applied equitably and ethically, AI can help improve certain processes and make them more efficient, including planning processes. This can free up time for planners to focus on the human factors of planning, such as connecting with community members, instead of spending the day counting traffic, for example. Similarly, improvements in e-government and automation of processes can be a boon for currently short-staffed planning departments.

Creating purpose



In some cases, however, it seems recent tech innovations have added additional mental strain and trust issues to our lives instead of making life easier or making us feel better. Social media toxicity, cryptocurrency

rollercoasters, and surveillance by Big Tech are just some examples. But why is that? Shannon Vallor, the Baillie Gifford Professor of Ethics of Data and Artificial Intelligence at the University of Edinburgh and director of the Centre for Technomoral Futures in the Edinburgh Futures Institute, recently [pointed out](#) that one of the reasons for this discrepancy is the lack of humane innovation and humane technology we see today.

Technology innovations, such as sewer systems or railroads, used to have a purpose for all and were built for the common good. Today, tech innovation seems to be for a narrow audience, ranging from the geeks among us who create new identities in the metaverse to billionaires who can afford to take a trip to outer space.

Giving technology a purpose again—using it to make our lives and jobs as planners better and to create equitable and sustainable outcomes—sounds easier than it is, but it is an opportunity for us as planners to create meaningful change in a world that is becoming ever more complex and less understandable.

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The trends we need to act on now

The list of trends on which planners need to act now is growing. Most of the trends from the 2022 Trend Report are still relevant. We share updates for some of them in 2023, such as the funding boost for **climate action** and new solutions for the **housing crisis**. But there are also new local priorities, such as **infrastructure** fixes, **digital trust** challenges in public space, and innovative ideas on how to make **transportation** more equitable and environmentally responsible. **Disillusionment** among young people, increasing public **health** concerns, and **social media** in planning are additional topics that need immediate attention.



Climate Policies, Funding, and Action



Federal funding in the 2022 Inflation Reduction Act and other legislation promises to play a major role in accelerating emissions reduction and climate adaptation efforts, including further development of alternative energy sources such as wind and solar power. Photo by Todd Heisler/*The New York Times*.

2022 saw major developments in the climate change arena in the U.S., particularly for climate change mitigation and greenhouse gas emissions reduction. The [2022 Trend Report](#) outlined a variety of concerning long-term trends related to the impacts of climate change, such as water scarcity and climate migration. These trends are especially notable considering the release of the Intergovernmental Panel on Climate Change's (IPCC) [AR6 Climate Change 2022 reports](#),

which document progress toward mitigation of greenhouse gas emissions and vital strategies for adapting to the impacts of climate change. One of the most critical trends of the [2022 Trend Report](#), the new political emphasis on climate action in the U.S., has borne fruit over the past year. The climate-centered provisions of the Inflation Reduction Act (IRA) promise to play a major role in driving existing trends and accelerating both emissions reduction and climate adaptation.

Support for a growing green economy

The climate change provisions in the IRA, totaling \$369 billion, constitute the single largest investment in climate mitigation and adaptation in U.S. history. These provisions are largely oriented toward accelerating the transition away from fossil fuels and toward a green economy. They include tax credits for consumers and businesses to incentivize the growth of low-carbon industries (such as

electric vehicle (EV) production, battery technology, solar and wind power, etc.) and significant investments in green and natural infrastructure, agriculture resilience, and habitat restoration. These measures are expected to simultaneously reduce the impacts of the most carbon-intensive industrial sectors of the U.S. economy, while growing carbon-neutral and carbon-negative industries. The impacts on communities will be significant, largely due to changes at both the consumer level (EV production, investments in transit, etc.), and at the industrial and [utility scales \(community wind and solar](#), industrial battery production, carbon-neutral grid electrification, etc.).

The clean energy transition

The [2022 Trend Report](#) highlighted the significant growth of the U.S. and global wind and solar industries. The IRA, which promises \$60 billion in incentives for wind and solar power generation, has the potential to greatly accelerate the

STILL RELEVANT FROM THE 2022 TREND REPORT

1.5-degree lifestyles and ethical consumption

Circular economy

Climate impacts on local and regional economies

Climate migration

Digitalization and digital emissions

Green building

Grid-connected solar and wind and smart grids

Synthetic/lab-grown meat

Water scarcity

For more about these trends, visit APA's online [Trend Universe](#).

transition away from carbon-intensive fossil fuels. Many of these incentives are targeted at building U.S. manufacturing capabilities for solar panels, wind turbines, and, critically, battery storage technology. The growth of the EV industry also

signals a major transition away from fossil fuels (for more on this topic see [Equitable, Environmentally Responsible Transportation](#)). The growth of these industries is critical to meeting national and global targets for emissions reduction, and the impacts on communities may be significant. Major local investments in technologies linked with clean energy may be a boon for job creation, especially in Rust Belt communities where excess manufacturing capacity and facilities could help reverse long-term declines in employment.

The methane emissions gap

The IRA also takes major steps toward addressing methane emissions, which are a sizable contributor to climate change. Methane, a byproduct of oil and gas production, is a far more potent greenhouse gas than carbon dioxide. A series of new incentives and regulatory measures could significantly reduce these emissions. The IRA allows Congress to penalize companies

that exceed certain methane leakage limits. Additionally, new fees on methane emissions from natural gas production could help to discourage wasteful extraction practices and reduce overall methane emissions. These and other measures signal a new willingness to address these especially harmful emissions through regulatory means and a shift toward holistic emissions reduction strategies.

Climate justice

The disproportionate impact of climate change on underserved communities was discussed in the [2022 Trend Report](#). A variety of provisions in the IRA reflect a commitment at the federal level to reduce the exposure of underserved communities to direct climate impacts and provide funding to address chronic disinvestment and environmental neglect. \$60 billion in the IRA is committed to climate justice priorities. This includes \$15 billion to support emissions reductions

for low-income, underserved, and underrepresented communities. Additional funding will also be made available through the Community Development Block Grant program for a wide array of critical environmental and climate justice needs, such as air quality monitoring and resilience to natural hazard impacts (such as flooding). The IRA also provides up to \$3 billion to address the historic injustices of highway development through urban neighborhoods. Reconnecting communities that have long been separated by highways could be a transformative step toward both environmental and climate justice for underserved urban communities (see also [Equitable, Environmentally Responsible Transportation](#)).

Electrification and decarbonization

There have been renewed efforts at the local and federal levels to reduce emissions and hasten the transition to clean energy and

alternative transportation options. In addition to electrification of transportation (see [Equitable, Environmentally Responsible Transportation](#)), this includes electrification of buildings.

In December 2022, the Biden Administration released the first-ever [federal building performance standard](#) aiming at increased electrification and net-zero emissions in all federal buildings by 2045. Washington, D.C., is moving to [ban natural gas](#) in most new buildings across the city by 2026. These and other electrification efforts are intended to improve air quality and reduce carbon emissions, while providing critical support to the growth of low-carbon energy sources such as wind and solar.

Carbon removal

Emissions reduction alone is likely not enough to meet the targets set by the IPCC to avoid catastrophic climate change impacts. To meet these targets, carbon removal is needed. IPCC projections already



Direct air capture (DAC) facilities aim to remove up to a million metric tons of carbon from the atmosphere annually through chemical scrubbing and rapid mineralization processes. Left, the world's first large-scale global capture CO2 removal plant, launched in Iceland in September 2021; right, a piece of mineralized CO2. Photos courtesy of Climeworks.

account for [Direct Air Capture](#) (DAC) of carbon, even though the technology is still in its infancy. DAC, which involves extracting carbon from the atmosphere and storing it (often underground), is starting to see deployment at larger scales. DAC facilities that can

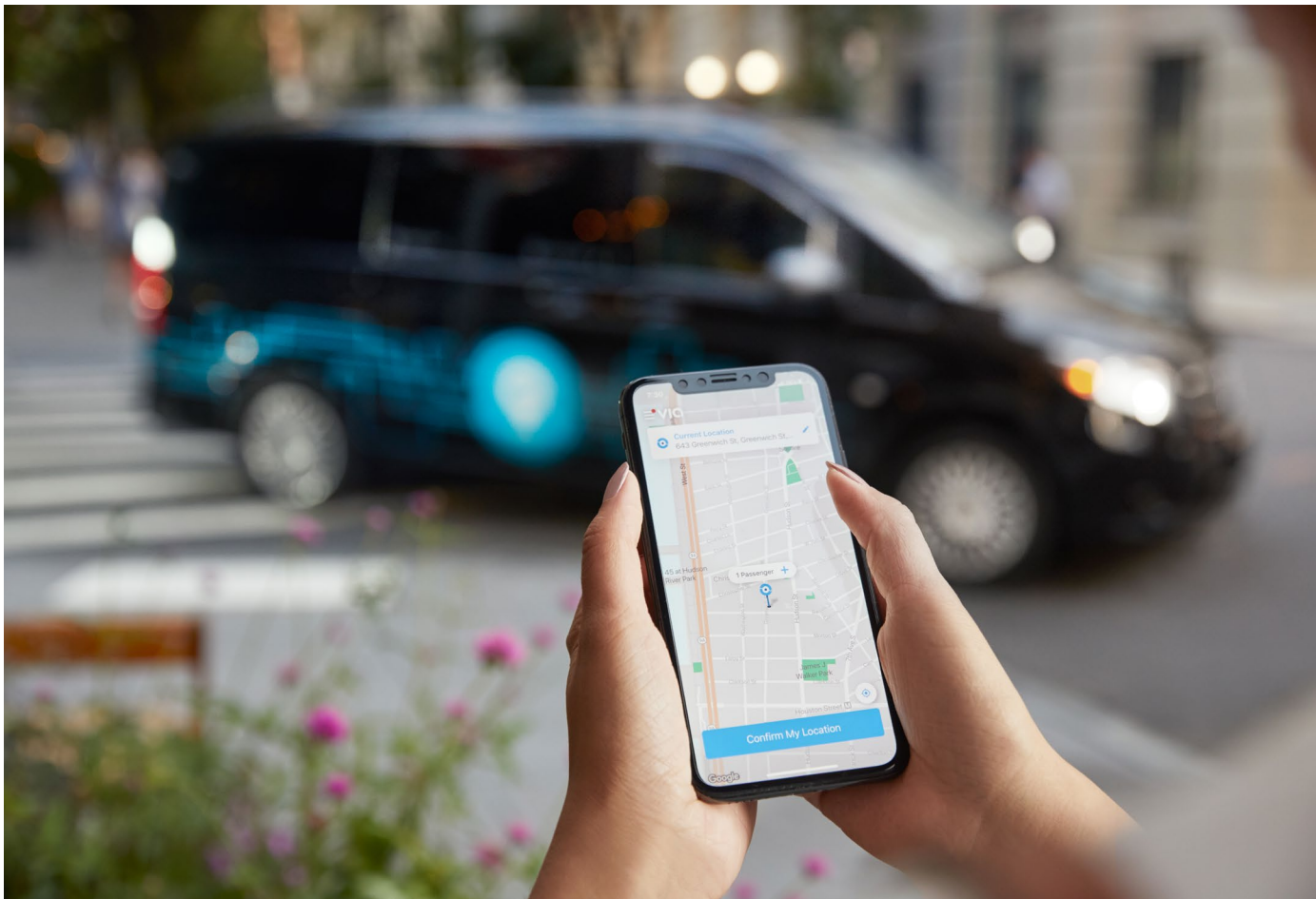
remove up to a million metric tons of carbon from the atmosphere annually are expected to begin operating in the U.S. and across the globe starting in 2024. Critics point to the high cost of these systems as distractions from more proven technologies and strategies

(e.g., preserving existing carbon sinks such as forests). Nevertheless, given the need for carbon extraction identified by the IPCC, carbon extraction technology is likely to be a major part of the climate change toolkit in the years ahead.

Geoengineering for climate change mitigation

Geoengineering—large-scale human intervention in the climate system—is among the [more controversial options](#) for fighting both the challenges of a warming climate and the impacts of climate change. The IPCC doesn't take a position on geoengineering largely due to the significant uncertainties associated with its use. The potential options in the geoengineering space are diverse, ranging from somewhat proven and established technologies, such as cloud-seeding to encourage rainfall, to more conceptual measures, such as solar radiation management and bioengineered trees. A significant risk of geoengineering in the fight against climate change is “maladaptation,” when actions taken to reduce vulnerability are likely to have adverse impacts elsewhere on people and the environment. These concerns are likely to play a major part in the conversation surrounding the wider adoption of geoengineering techniques.

The Digital Era



Inspired by the success of private rideshare companies, multiple transit agencies are piloting on-demand transit or microtransit programs using municipal staff and vehicles managed on software platforms provided by private companies. Photo courtesy Via.

The digitalization of everything continues. While there are many advances, there are also challenges that need solutions. In the era of smart cities, planners need to understand the shortcomings and opportunities posed by the technologies increasingly integrated in everything we do (and they need to include elements of urban tech, gov tech, and civic tech in their plans; see also APA's PAS Report 599, [Smart Cities: Integrating Technology, Community, and Nature](#)).

The city on demand

The “Amazonification” (see also [Amazonification and Other Retail Trends](#)) of everything has reached local government. With the evolution of the digitalization of everything, customer expectations regarding online city services, personalization, and customization are rising. Government services are expected to be flexible and responsive to individual needs.

For example, inspired by the success of private rideshare companies, multiple transit agencies

are piloting on-demand transit (or microtransit) in areas that do not meet the density requirements for a functioning transit system. The programs can use either fixed or customized routes and fixed or on-demand schedules. Many of the transit agencies who run these programs purchase software from private companies but provide their own employees and vehicle fleets.

In addition to customizable city services, there may be a market for new services or improving how these services are managed.

For example, blockchain advocates are promoting this technology to manage commercial agreements and contracts for street and municipal infrastructure and services (see [Blockchain, Crypto, and NFTs](#)).

Decreasing digital trust

In 2022, [ISACA](#) found that only 54 percent of people in the U.S. trust technology companies to act ethically, down 19 points since 2019. On the other hand, [McKinsey](#) found that 70 percent of consumers have at least a moderate degree of confidence in companies they choose to do business with protecting their data—despite the reality that the mitigation of risks by most organizations are unimpressive. There is a mismatch between people's understanding as well as their daily interactions with surveillance and AI technology and the level of security of digital infrastructure that they use.

Public distrust of all things digital is an underexplored dilemma in planning, especially considering the

INSIGHT FROM OUR TREND SCOUTS

“My biggest concern is that I see science and technology speeding ahead, digitalization solutions speeding ahead, but I don’t see our governance and planning being able to move at that speed.”

—Bill Cesanek, AICP, Water & Planning Network

continued digitalization of everything. Trust is a collective emotion and there is a power imbalance between providers and users in the digital world. Digital trust describes the relationship between the users (those who give trust, like consumers and residents) and the providers (those who guarantee to uphold protection, like businesses and governments).

Digital technologies and



Cities around the world are testing new technologies in ways that prioritize public visibility and participation. This sign in Boston uses the Digital Trust for Places and Routines (DTPR) standard to increase transparency and enable resident feedback for sensors measuring how a street reconstruction project will affect air quality in an underserved community. Photo courtesy City of Boston/Helpful Places.

digitalization have been characterized as increasingly volatile, uncertain, complex, and ambiguous (in short, “[VUCA](#)”). Meanwhile, governments are investing more than

ever in internet-connection technologies (like sensors) to improve parking, streetlights, and other public services. But installation of city-owned surveillance tools in public

spaces—and more private access to surveillance tools (see [Political Shifts in Safety and Security](#))—is problematic within the context of low digital trust. Digital trust and designing public spaces in the digital age will go hand in hand.

Cities such as Washington, D.C., and Boston are piloting transparency standards ([Digital Trust for Places and Routines](#), or DTPR) to build trust in their increasingly digitally equipped public spaces. This includes placing visual markers and providing scannable codes that inform the public of nearby technology such as sensors and cameras. Planners are simultaneously being charged with restoring community trust, experiencing the effects of low public trust in local government, and responding to digitalization (in some cases, promoting digitalization). To improve planning, these disparate efforts need to be merged.

Solving the digital divide

Over the past year, increased awareness of the impacts of the

digital divide has led to an increase in funding for digital equity and inclusion. Most of the funding is coming through the Bipartisan Infrastructure Law (see [Federal Funding and Local Priorities](#)), under the Digital Equity Act section. The expansion of broadband internet and cybersecurity measures to reduce digital vulnerability are currently the top priority measures. In May 2022, Chicago launched a [Digital Equity Council](#) (DEC) as a community-driven effort to engage with those most burdened by digital inequities. APA's PAS Report 569, [Planning and Broadband: Infrastructure, Policy, and Sustainability](#), explains how planners can address this challenge in their communities.

Digital permanence

The amount of data we produce is skyrocketing. [From 2018 to 2020](#), the total amount of data that people used increased from 33 zettabytes (ZB) to 59 ZB. By 2025, researchers predict this figure will

reach 175 ZB. And if we look all the way back to 2003, humans only created five billion gigabytes—a mere 1/200th of a zettabyte.

Beyond the power needed to sustain the production of data, preservation is a separate issue. Digital frailty describes our collective vulnerability to losing stored digital information. Threats to digital archives include technical glitches and switching between file systems. But digital frailty can also be purposeful: ephemeral formats are appealing in the new generation of social media with Instagram and Facebook stories, Snapchat, and most recently, BeReal (see [Social Media Use and Media Literacy](#)).

Digital frailty could disrupt how we practice hindsight or how historians conduct analyses of the digital era. For example, posts by public officials or web page updates between government administrations may be historically valuable but currently have the potential for deletion. Or if major platforms like Twitter disappear,

STILL RELEVANT FROM THE 2022 TREND REPORT

5G and 6G
Crowdsourcing
Data protection and privacy
Digital dividends
Digital emissions
Digital inclusion
Digital vulnerability and cybersecurity
Hybrid community engagement
Scoring systems
Smart cities
Surveillance tools
Wearable technology

For more about these trends, visit APA's online [Trend Universe](#).

we would lose nearly two decades of information. While the preservation of analogous physical information has been traditionally

impossible, there may be societal benefits from being able to preserve and access the entirety of the digital era. But there are also ethical concerns, such as storing data produced by people under the age of 18—be it schoolwork or social media posts.

Planners and local government officials need to make decisions on what planning work should be preserved—such as data to evaluate and monitor programs or to measure plan performance—in addition to the ethical storage and maintenance of this data.

Data centers moving into cities

The resources required to store and transmit data are an environmental concern. The [2022 Trend Report](#) expressed the need for planners to take action to reduce greenhouse gas emissions from digitalization and optimize the location of data centers.

Any virtual reality or fully digital world (see [The Metaverse](#))

will need to match the immediacy of real-world experience. With the increased amount and speed of data processing this will require, data centers are moving closer to the users and into communities.

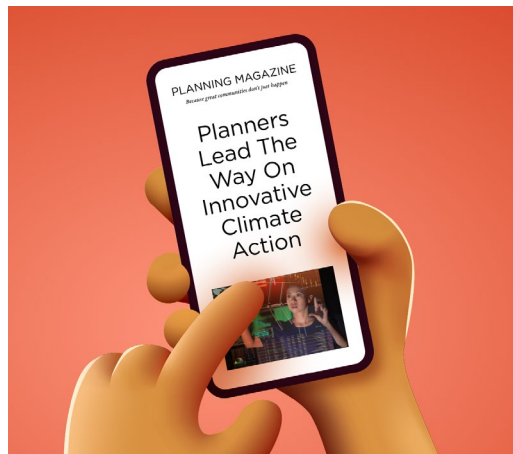
Post-COVID, some cities have started to repurpose abandoned office buildings into data centers or colocation centers. [Colocation centers](#) are a type of facility owned by companies that rent out the space and equipment to host data centers. Planners should not let the invisibility of these land uses prevent their integration into our existing urban ecosystems. For example, waste heat from data centers can be used to generate energy for district heating systems.

The Futures of Smart Cities and Climate Action

Will private companies take charge and focus on profit over people? Photoillustrations by Kevin Childers

Planners are leading smart city developments with a people-centric approach.

The federal government prioritizes climate action.



**SCENARIO D
NIMBLE RESILIENCE**

The federal government remains committed to fighting climate change

Planners integrate smart tech (where useful) and use federal funding to resolve climate change issues

Planners build a strong symbiotic relationship with federal government and the tech sector

**SCENARIO A
COLLABORATION WITH BIG TECH SAVES THE WORLD**

Planners integrate smart tech (where useful) to resolve climate change issues

The federal government doesn't provide funding for climate action

Planners collaborate with tech companies who are funding climate action through PPPs



The federal government halts support for fighting climate change.



**SCENARIO C
PUBLIC FUNDING, PRIVATE CITIES**

The federal government remains committed to fighting climate change

Big Tech receives federal funding for innovative climate action as part of smart city initiatives

Public-sector planners focus on policies and low-tech solutions

Private tech companies take the lead in urban innovation, prioritizing profit over people

**SCENARIO B
PRIVATIZATION IS TAKING OVER**

Planners don't want to engage with smart tech and smart city developments

Private tech companies take the lead in smart city applications, prioritizing profit over people

Planners lack funding and advanced solutions for climate action

The private sector fills the void on climate action, but the solutions are extremely inequitable



Private-sector tech companies are leading smart city developments with a profit-based approach.

Scenarios 2030

Federal Funding and Local Priorities



Many U.S. cities are in urgent need of infrastructure upgrades. According to the American Society of Civil Engineers Infrastructure Report Card, every two minutes a water main breaks, wasting six billion gallons of treated water every day across the country. Photo by Giorgio Rossi/Alamy.

Political priorities manifest in federal funding opportunities. Whereas in the last few years action on climate change, the digital divide, and housing was coming from state and local governments, the federal government is now providing more resources to address these concerns. Three major federal bills that provide investment in communities can be a sign

of the direction of local planning efforts. Additionally, local priorities are reflected in new roles that have been created in local governments over the last several years.

Advancing solutions to structural and systemic challenges

Trends in local spending are influenced by the American Rescue Plan Act (ARPA), which was signed in March 2021. The Coronavirus State and Local Fiscal Recovery Fund (SLFRF) under ARPA is providing \$350 billion for states,

municipalities, counties, tribes, and territories. Local spending on government operations accounts for the largest share of SLFRF dollars. Cities and counties have budgeted significant amounts of their funds towards infrastructure, public health, and public safety projects.

Addressing immediate and acute needs was the first step. For example, with public-sector workers quitting en masse, some communities used ARPA funding to increase salaries and attract employees. Now, there is potential for advancing solutions to the structural and systemic issues that worsened during

the first two years of the COVID-19 pandemic. Albany County, New York, is conducting an analysis of high-speed internet in the county to begin improving broadband and close the digital divide. [Baton Rouge, Louisiana](#), is investing in cybersecurity measures to combat digital vulnerability. [Denver](#) is investing in affordable housing and assessing all city-owned and contracted shelters due to increasing homelessness.

Fixing and retrofitting America's infrastructure

The Infrastructure Investment and Jobs Act (IIJA), also known as the Bipartisan Infrastructure Law, which was signed in November 2021, provides \$1.2 trillion for transportation and infrastructure spending. This combined with ARPA funding gives cities the opportunity to refocus their

spending on urgently needed infrastructure repairs. According to the American Society of Civil Engineers (ASCE) [2021 Infrastructure Report Card](#), in the U.S., every two minutes a water main breaks, wasting six billion gallons of treated water every day. In addition, over 40 percent of public roadways are in poor condition. And there are many more examples of crumbling infrastructure that needs improvements.

Based on an [analysis of mayoral speeches](#) by the National League of Cities, fixing and repairing roads, bridges, and water systems along with installing broadband internet are the top priorities for mayoral spending in the coming years. Additional priorities include economic development and mixed-used developments in downtown and central business districts and investments in safety (including crime prevention and criminal justice reforms).

Funding decisions will also be influenced by the federal Buy America, Build America Act (BABA), which incentivizes the uses of goods and services made or

**INSIGHT FROM
OUR TREND SCOUTS**

“The Justice40 Initiative is a way to create a common platform for evaluating these issues, identifying which places qualify and which places should get funding. Sustainability has become a practice, and equity is starting to become a practice.”

—Walker Wells, AICP, LEED AP, EcoDistricts AP, Raimi + Associates, University of California, Los Angeles

provided in the U.S., and the [Justice40 Initiative](#), which aims to commit at least 40 percent of all federal funds to disadvantaged communities.

Renewed support for climate action

One of the goals of the Inflation Reduction Act (IRA) is to lower energy costs, increase cleaner energy production, and reduce carbon emissions by roughly 40 percent by 2030. For more on IRA-related climate funding, see [Climate Policies, Funding, and Action](#).

New leadership for local priorities

In recent years, several local governments have created new roles with cross-sectoral, cross-departmental functions, indicating new priorities. While the 1980s and 1990s saw the rise of chief information officers, showing the growing importance of IT systems in private and public entities, the early 2000s produced chief sustainability officers and later chief resilience officers. Since then, many more cross-functional positions have been created. In 2019, Detroit hired its first [Digital Inclusion Officer](#), who was tasked to find solutions to decrease the

STILL RELEVANT FROM THE 2022 TREND REPORT

Funding from foundations

Policy pendulum shifts

Rematriation through land taxes

Reparations programs

State-level intervention in local affairs

Universal basic income programs

Urban infrastructure and AI

For more about these trends, visit APA's online [Trend Universe](#).

digital divide within its communities. Focusing on climate change and its impacts, Miami created the role of [Chief Heat Officer](#) (see also [Urban Heat](#)) and Boston hired a [Director of Green Infrastructure](#) in 2022. Topics such as citizen experience and inclusion are priorities in New York City, where Mayor Eric Adams recently hired a [Director of](#)

[Customer Experience](#). Meanwhile, striving to become the smartest city in the world while prioritizing data privacy and protection, London created the role of [Data Ethicist](#). Chief Futures Officer is a title we have started to see in private entities, making the case for an increased need to integrate foresight and futures thinking across all industries. A great public-sector example is [Future-Focused Calgary](#), the City of Calgary's strategic foresight and resilience dividend program.

It seems the trend is moving toward more holistic approaches to city government. Instead of siloed department structures, local governments are now trying to centralize leadership in their priority areas while making sure all relevant departments report to these priority areas, and collaboration between departments can be facilitated more effectively.

Mass Extinction and Rewilding

Our planet is experiencing what scientists are calling “the sixth great mass extinction.” According to the [2022 Living Planet Report](#), published by the World Wildlife Fund, wildlife populations have seen an average decline of 69 percent in the last 50 years. Today’s rates of extinction are far beyond any extinction rate that has existed in natural history.

The phenomenon of biodiversity loss on Earth came to public attention in the mid-1980s, after the Smithsonian Institute and the National Academy of Science joined forces to host a national forum and publish findings on the topic. Nearly 35 years later, biodiversity loss is still occurring at an alarming, and worsening, rate.

A PAIR OF ECO-CRISES. Momentum in environmental action today has shifted towards dealing with the climate emergency. But biodiversity loss is a full-fledged issue that deserves informed attention

to its causes, effects, and solutions. Solely focusing on the former could pose risks to the latter. A [2021 joint study](#) by the IPCC and Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) found that some methods for climate mitigation threaten biodiversity, especially land-based techniques such as large-scale tree planting (afforestation) or growing crops and burning them for energy (bioenergy). And solar, wind, or hydropower energy developments that are built without ecosystem considerations can also hamper local wildlife protection.



In North America, bison are one of the 20 threatened species across the globe that, if restored to their historic ranges, could help increase the total coverage of large mammals to 23 percent of the world’s land area. Photo by JREden/iStock/Getty Images Plus.

While this relationship also goes the other way—solely focusing on restoring biodiversity could potentially bring risks to climate action—the IPCC-IPBES report found that biodiversity measures can be more commonly beneficial for both causes. Climate action and solutions to sustaining biodiversity can be complementary, but they must be strategic and aligned. But currently, at the international level, climate change and biodiversity are addressed at separate summits.

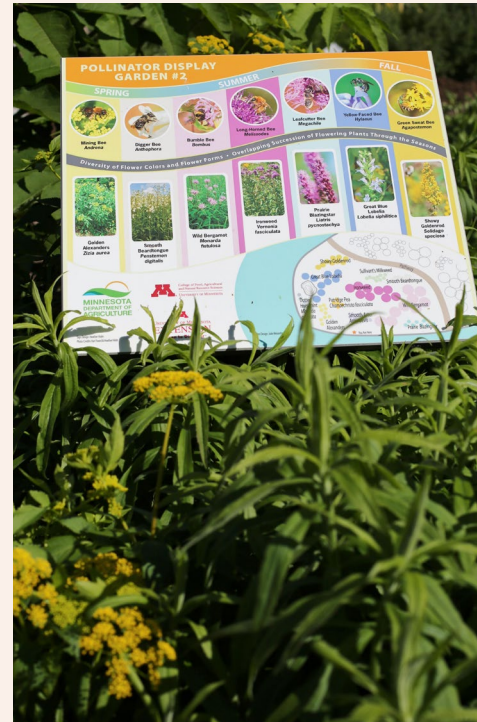
GLOBAL ACTION ON THE RISE.

The latest [United Nations Biodiversity Conference \(COP15\)](#)—which was held in person in December 2022 after a four-year disruption—could potentially reenergize efforts to address biodiversity loss. This meeting led to the adoption of a [post-2020 global biodiversity framework](#). The UN’s Biodiversity Convention first committed to a 2010 Biodiversity Target at COP6 in 2002, but largely failed to meet its goal. The *Strategic Plan for Biodiversity 2011–2020* adopted at COP10, which included

the [Aichi Biodiversity Targets](#), saw a similar fate. The post-2020 framework has its sights set on a more future-focused timeline: a vision for 2050. Barring any major policy pendulum shifts at the federal level in the U.S., this international framework will influence national, state, regional, and local policies.

REWILDING. One trending biodiversity solution with relevance to planning is rewilding, an ecological strategy that rebuilds the population of animals in addition to restoring wildlife habitats. Contemporary environmentalism has only recently begun to recognize what traditional ecological knowledge has been telling us for centuries: national parks alone won’t protect the biodiversity of the U.S. Habitat restoration without wildlife is merely scenery, and rewilding proposes urban and rural integration into the project of biodiversity.

Rewilding isn’t a new idea; researchers first promoted it nearly 25 years ago, and small-scale rewilding has seen some success. Tactics



Pollinator gardens supporting bees, butterflies, and other wildlife are one of many biophilic planning efforts planners can use to increase biodiversity in cities. Photo by Gina Kelly/Alamy.

like bioarchitecture (or “living architecture”) to accommodate urban bats, possums, and birds or pollinator gardens for bees and butterflies may already sound familiar to some planners. Biophilic planning—supporting biodiversity by improving

ecological connectivity for the benefit of both people and animals—is growing as a movement in the profession. APA’s PAS Report 602, [Planning for Biophilic Cities](#), recognizes the global biodiversity crisis and the benefits of integrating nature in cities. See also the APA blog post on [wildlife-friendly solar development](#); the *Zoning Practice* article “[Zoning for Urban Wildlife and Biodiversity](#)”; *PAS QuickNotes* 96, “[Climate-Resilient Pollinator Gardens](#),” and the 2018 *Planning* article on [the “half-earth” approach](#). To fully address biodiversity loss, we may need to start thinking bigger and implement rewilding on a larger, even more integrated scale.

REWILDING LARGE MAMMALS.

Some species have been hit harder by habitat loss and ecosystem destruction than others. The Living Planet report found that freshwater populations saw the highest average decline of any species group (83 percent) in the last 50 years. While planners have a responsibility to contribute to water ecosystem

restoration, they have much more control over land use and development. Just 15 percent of the world's land area supports large mammal species (not including humans). Recent studies suggest that restoring large mammals is key to improving overall biodiversity.

Common perceptions of large mammals as dangerous or destructive typically leave them out of mainstream restoration efforts. In North America, brown and black bears, bison, wolverines, and pumas are five of the 20 threatened species across the globe that, if restored to their historic ranges, could help increase the total coverage of large mammals to 23 percent of the world's land area. This could more than double U.S. land area with intact large mammal communities, primarily in the northern Plains, Mountain, and Southwest regions. This would lead to a positive domino effect on multiple ecoregions—comparable to the success of reintroducing gray wolves to Yellowstone National Park in the mid-1990s.

Rewilding also fits in with President Biden's "[America the Beautiful](#)" plan, which aims to conserve 30 percent of U.S. land and water by 2030. Federally owned land will likely see the first large-scale rewilding cases, and planners at the state and local levels should keep track of how these projects progress.

In the end, urban areas have a responsibility to ramp up wildlife-friendly planning, while suburban and rural areas have a responsibility to support larger mammals through wildlife-friendly development. For all planners, promoting coexistence between people and wildlife will be key and may require collaboration with biologists and wildlife experts.

INNOVATIONS IN REWILDING.

Recent publicity on mass extinction is not the only factor breathing new life into rewilding as a strategy. Innovative technologies are changing what rewilding can look like. [Colossal](#), the world's first "de-extinction" company, is researching how it can use DNA technology to

resurrect extinct animals or preserve species on the brink.

And in addition to the role familiar professions (like landscape architects, planners, and even ecotourism workers) may play in rewilding our communities, there are specialized industries and occupations that are growing due to technological advances and community-based science, such as [parataxonomy](#) and [bioprospecting](#).

Food production, which contributes to habitat loss, is the cause of nearly 70 percent of the decline in terrestrial biodiversity. The conflict between food production and rewilding is minimal, but we are already seeing a shift towards food becoming more intensively produced in fewer areas. Thus, there is an opportunity for planners to promote rewilding projects alongside emerging land uses such as large-scale solar development. Increased biodiversity can also improve food production. While this deep dive primarily focuses on animal and terrestrial biodiversity, the loss of pollinators such as bees poses a significant

threat to food production. Emerging technologies such as precision agriculture and pollination—which uses AI, machine learning, and sensors to collect hive data—can improve pollinator efficiency of a smaller bee population.

As it stands, we cannot innovate our way out of mass extinction and biodiversity loss. We will need to do the work of restoring wildlife habitat and adopting new cultural attitudes towards balancing human development with animal needs. Rewilding is just one piece of this puzzle, but one for which planners may be called upon to consult.

Gender Expansiveness and Gender Mainstreaming



Gender is a social characteristic critical to the work of planners, with real-world equity implications for transportation behaviors, daily activities, and public space use—for example, accommodations for the needs of women, who are more likely than men to have daily childcare responsibilities. Photo by Maskot/Alamy.

Gender is one social characteristic that is critical to the work of planners, even if planners are not explicitly thinking about it. Whether it's differences in transportation behaviors, housing preferences, or even how someone uses public space, gender can shape decision-making and impact people's lives. Gender is emerging as an area of interest in the profession to intentionally advance equity and address the historical

consequences of inequitable policies and plans. General trends in gender include the increased popular awareness of the topic, the involvement of the tech world, the effect of gender on labor participation, the adoption of gender mainstreaming as a policy framework, and the evolution of inclusive design.

Popular awareness of gender expansiveness and gender neutrality

Discussions about gender, particularly those beyond the traditional

gender binary, are becoming more common in major media outlets. As a result, the public is becoming more aware of and vocal about these topics. Gender expansiveness, which is shifting from a fringe worldview, pushes us to imagine life outside the gender binary—but not without backlash.

Gender neutrality is an attempt to avoid assuming roles or preferences based on gender stereotypes, or to not reinforce the gender binary, which is the traditional system of gender classification that defines every individual

as either male or female. It is often conflated with nonbinary genders, which are genders that exist outside the gender binary. One of the first visible pushes for gender neutrality on a wider scale was in the beauty and fashion industries. This may have been a signal of a shift in cultural practices, namely how people express and present themselves. In recent years, however, regular reporting on nonbinary and transgender experiences and the tense negotiation of civil rights through federal and state legislation has proven the larger relevance of this topic.

As discussions around gender continue to mature, planners need to balance addressing real-world implications of gender on public space use, behavior, and daily activities with avoiding reaffirming the systems that lead to exclusionary and limited understandings of gender.

Women leaving the workforce and leadership roles

COVID-19 worsened the divide between working men and women. Among adults 25 and older with only a high-school education, [more women left](#) the labor force than men in the last two years, and [men have now recouped](#) all pandemic-related job losses since February 2020.

The pandemic shift to working from home gave more college-educated women employment opportunities, though the pandemic's impact on the quality of women's experience in the workforce is not necessarily positive. The gap between women and men in senior roles quitting their jobs is the largest it has been since this data was first collected in 2015, indicating women's dissatisfaction with returning to "business as usual."

Overall, the economic impact of the pandemic was shouldered by Black and Latina women, mothers of young children, caregivers for parents, and women who did not

STILL RELEVANT FROM THE 2022 TREND REPORT

Aging U.S. population
Diversity awareness
Individual identities
More racial and ethnic diversity
Recognizing the importance of intersectionality

For more about these trends, visit APA's online [Trend Universe](#).

have the option of remote work. This also points to continuing trends in the types of work that women do, such as childcare, schooling, medical care, and service industries.

Adopting (and adapting) gender mainstreaming

[Gender mainstreaming](#), a strategy used in European countries since the 1990s that identifies how policy

decisions impact people based on gender, is gaining ground in the U.S. The recognition of nonbinary genders, as well as the needed inclusion of transgender people in these conversations, gives U.S. planners an opportunity to leverage their slow adoption of gender mainstreaming to develop an even more inclusive version of this approach.

Inclusive design and public amenities

Public space and inclusive design are also directly related to the maturing conversation around gender. One recent trend is the [disappearance of bathrooms](#) as a public amenity. This disproportionately affects women because more of their daily activities (like childcare) or biological needs typically require more frequent bathroom access.

Private companies controlling access to bathrooms can also lead to discriminatory practices against marginalized genders. Inclusive design often still focuses on



There is a growing market for digital health technologies geared towards women, or FemTech. One example of FemTech is EloCare's wearable technology and mobile app, which helps women track their menopausal issues so that medical interventions can be better designed. Photo courtesy of EloCare.

biological differences rather than the overall diversity of body types. Sometimes, for instance, age and (dis)ability can be more relevant to design than gender identity.

FemTech

There is a growing market for digital health technologies geared towards women, or [FemTech](#). Popular examples of FemTech include

menstruation tracking apps and newer innovations such as biodegradable and flushable at-home pregnancy tests (see also [Policy Impacts on Health](#)). Funding for the FemTech industry, which began in the 2010s, was slowly on the rise until the pandemic hit in 2020, and by January 2022 investments had skyrocketed. Privacy and surveillance concerns—especially after the U.S. Supreme Court's overturning of *Roe v. Wade*, which prompted warnings to women in pro-life states to stop using menstruation tracking apps (see also [Policy Impacts on Health](#))—could be a disruptor to this burgeoning market. But FemTech's growth shows that gender considerations in health care are becoming a social priority.

Policy Impacts on Health



The use of telemedicine, doctorless exams (where sensors and artificial intelligence capture health data to provide a direct diagnosis to the patient), at-home medical laboratory tests, and direct-to-consumer health care models is increasing. Photo by Erdark/E+/Getty Images.

After decades of improvement, U.S. life expectancy fell by 1.8 years in 2020. In 2021 it dropped another 0.9 years—the largest decrease in [life expectancy](#) over a two-year period since the 1920s. Non-Hispanic American Indian-Alaskan Native people and non-Hispanic Black people had the biggest declines. Reasons for this drop include [COVID-19, drug overdose, and accidental injury](#). COVID-19 and its effects on physical and mental health,

as well as other factors impacting life expectancy, are some of the trends discussed in this cluster. Major disruptors in this category are infectious diseases, sociopolitical factors, and technology.

Societal “long COVID”

COVID-19 was the third leading [cause of death](#) in 2022. “[Long COVID](#)” refers to a range of ongoing, recurring, or new medical conditions that people will suffer from long after the initial COVID

infection, including chronic fatigue, malaise, anxiety, depression, insomnia, brain fog, and other cognitive changes. More research is needed to understand the pandemic’s long-term effects on physical and mental well-being. Adults may experience increased challenges exacerbated by COVID-related grief, anxiety, and depression.

In the long term, COVID-19 may have even more adverse impacts on children. New research suggests that the pandemic [erased two decades](#) of educational progress

in math and reading. Due to the deprivation of social interactions, students returning to in-person classes saw a significant increase in fights, attacks on teachers, and other violent acts. Integrating nature into educational spaces may help students manage their stress, anxiety, and depression and improve other mental health indicators.

Advances in medicine and health care

COVID-19 has accelerated the advancement, development, and use of technology in medicine and health care. The use of telemedicine, doctorless exams (where sensors and artificial intelligence capture health data to provide a direct diagnosis to the patient), at-home medical laboratory tests, and direct-to-consumer health-care models is increasing. The use of telehealth is [38 times higher](#) than before

the pandemic. Although at-home lab tests have been available for decades, over-the-counter COVID-19 rapid tests have now made at-home medical testing commonplace. According to a February 2022 report, the at-home test industry is projected to be worth over [\\$2 billion by 2025](#). There has also been a rise in subscription-based health-care providers, such as Forward and Ro Health.

As more consumers seek out convenient, on-demand health care, tech-enabled services may threaten traditional primary-care models and push health-care providers to adopt technological changes. For planners, this will impact the siting of health-care facilities, including clinics, urgent cares, and health centers. More research is needed to understand the real impact of these trends on brick-and-mortar health-care facilities.

Rise in overdose deaths

One of the reasons for declining life expectancy in the U.S. is deaths

STILL RELEVANT FROM THE 2022 TREND REPORT

Declining life expectancy
Local food systems planning
Nature-based solutions
Worsening mental health

For more about these trends, visit APA's online [Trend Universe](#).

due to overdoses involving fentanyl, an opioid that is often mixed with other drugs, and methamphetamine (meth), a synthetic stimulant. After a catastrophic increase in 2020, [deaths from drug overdoses](#) rose again in 2021 to record-breaking levels, nearing 108,000. Data suggests that overdose deaths are most predominant among working-age white men and women without college degrees.

Some call them "[deaths of despair](#)"—a term coined by economists Anne Case and Nobel Laureate Angus Deaton—as economic

stagnation and underlying deep structural and social issues drive much of the drug use that causes these deaths. The COVID-19 pandemic has only worsened the situation. Widespread social isolation and economic dislocation caused relapses in drug use and could have contributed to rising overdoses.

Planners can help with isolation by creating socially connected communities. By designing public spaces that encourage gatherings and creating built environments that support social interactions, planners can help improve social connections among community members.

Gun violence

According to the [CDC](#) and the [American Public Health Association \(APHA\)](#), gun violence is a public health issue. It includes homicide, violent crime, attempted suicide, and unintentional death and injury. In 2020 (the most recent year for which complete data is available), [45,222 people died from gun-related injuries](#) in the U.S. This

number represents a 14 percent increase from the year before, a 25 percent increase from five years earlier, and a 43 percent increase from a decade prior. Data also shows that mass shootings are on the rise. 2022 marked the third year in a row with more than [600 mass shootings](#) (minimum of four victims shot and either injured or killed, not including any shooter who may also have been killed or injured in the incident) in the U.S, causing more than 600 deaths and almost 3,000 injuries. And 2022 also saw more than [30 school shootings](#) in the U.S. that resulted in injuries or death, including the May 24 shooting at Robb Elementary School in Uvalde, Texas, where 19 students and two teachers died.

Gun violence can be reduced through a comprehensive approach that involves various programs, policies, and strategies. While numerous aspects of this approach are beyond the realm of planning, many gun-related crimes occur in public spaces, and planners can help design safe public spaces.

For instance, [Portland, Oregon](#), recently eliminated a slip lane that had allowed vehicles to bypass a traffic light, reducing drive-by shootings at what had become a deadly intersection. In schools and other public spaces, planners can use landscape features, such as [safety gardens](#), to help create attractive, yet functional, safe places. And [vacant lot remediation](#) and [renovating abandoned houses](#) has reduced gun violence in various communities, including Philadelphia. Additionally, multiple studies show that increased exposure to nature can reduce mental fatigue and related violence and crime in communities. PAS Report 602, [Planning for Biophilic Cities](#), describes how elements of nature can improve a community's overall well-being and reduce violence.

Abortion access

The U.S. Supreme Court's decision to overturn *Roe v. Wade* has a far-reaching impact on pregnant people's health. Two years ago,

about 250,000 people had abortions in the places where it is now or may soon be banned or severely restricted. But since the *Dobbs* decision, reproductive rights have been on the ballot in six states, and each time voters sided with abortion rights.

Due to new bans on abortion in [13 states](#), there may be a need for more health-care facilities in states that allow abortions due to increased demand. Clinics in states such as Colorado, Illinois, and New York are already seeing more patients as pregnant people travel from other states for abortions. Planners should be prepared for changes in land use and zoning to respond to this additional demand. In addition, if places where abortion is banned begin to see higher birth-rates, planners may need to consider whether their communities have adequate social services, facilities, and housing to support the needs of growing families, especially parents and children in more vulnerable or marginalized populations.



Planning for aging in place and dementia are more important than ever, as the number of people with dementia and Alzheimer's disease is expected to more than double by 2060. Photo by Toa55/Shutterstock.

Dementia and aging populations

The national median age saw its [largest single-year gain](#) according to the U.S. Census Bureau's 2021 Population Estimates—showing that the aging U.S. population trend is still ongoing. Thus, aging in community remains an important concept for planners.

Given the uncertainty about the long-term effects of

COVID-19 on cognitive function (see also [Societal “Long COVID”](#)), trends related to dementia and Alzheimer's disease are pertinent. The number of people with dementia and Alzheimer's disease is expected to [more than double by 2060](#), with these cognitive diseases expected to most affect Hispanic and Black populations. Women are currently nearly two times more

likely than men to be affected, primarily due to their longer average lifespans.

Planning for aging in place and dementia are more important than ever. More than half of nursing home residents have dementia, but more than four times as many people with dementia live in traditional housing. Housing policies need to support affordability for older adults, especially those with dementia; intergenerational homes; and communities of care. A [recent study](#) that reviewed 23 research articles found that interaction with natural environments and public spaces plays a crucial role in the well-being of people with dementia. Thus, planners can help develop policies that can minimize disparities in dementia risk, namely equitable access to resources and environments that contribute to healthy cognitive function, such as [aging-supportive communities](#), [dementia-friendly communities](#), and communities that support [intergenerational living](#).

Assistive tech

Planning for aging in community and planning for people with disabilities go hand in hand. Disabilities are more common among older populations, and the long-term effects of COVID-19 may increase the number of people affected by cognitive disabilities as they age. The tech sector has increasingly shown an interest in helping people with impairments or disabilities navigate the world. Not only are Big Tech's major players improving the accessibility of their own products, but a separate market for [assistive tech](#) is emerging. Products such as sensory aids and mobility aids are lucrative, as is the potential to 3D print prosthetics. Wearable AI is also an emerging field. The ubiquity of assistive tech may facilitate some solutions to aging in community.

Urban Heat

Extreme heat is one of the deadliest climate risks in the U.S. In urban areas, the challenges of extreme heat are especially pronounced. As climate change continues to lead to extreme weather, and as formerly anomalous heat events become the norm, building resilience to urban heat is a critical goal for communities across the U.S. Recent major heat events have helped to elevate the causes,

costs, and consequences of urban heat in the public consciousness and among planners and communities. The extreme heat events in the [Pacific Northwest in 2021](#) and in the [United Kingdom in 2022](#) have been a wake-up call on the very real dangers of sustained heat impacts in urban and rural communities and in the natural environment.

For many urban communities, the [urban heat island effect](#) has been a fact of life for decades. Buildings, roads, and other elements of the built environment absorb heat at a higher rate than elements of the natural environment. This, combined with waste heat, can lead to higher

daytime and nighttime temperatures (up to seven degrees and five degrees Fahrenheit, respectively). But the extreme and dangerous temperatures in urban communities are often a policy choice rooted in neglect, especially for underserved communities and communities of color. More than 700 people died in the [Chicago heat wave of 1995](#), primarily in underserved and low-income communities. Legacies of highway building, slum clearance, and lack of greenspace in urban neighborhoods have all played major parts in exacerbating the poor public health outcomes associated with urban heat. Increasing the



The widespread use of cooling centers is an important component of urban heat resilience systems, which can help cities respond to extreme heat in urban areas exacerbated by climate change. Photo by Jose A. Alvarado Jr./The New York Times.

urgency for action on urban heat challenges is climate change, which is exacerbating the formation of urban heat islands and the occurrence of extreme heat events that have significant impacts on public health, the environment, the economy, and infrastructure.

Urban heat-resilient systems can function or rapidly return to desired functions in the face of heat-related risks. Planners, health-care providers, local governments, and other decision makers have critical roles in addressing the impacts of urban heat through planning and implementing strategies to respond to extreme heat and build their communities' resilience to urban heat. Solutions include greening and urban forestry practices, urban design principles and regulations that reduce heat retention, the use of early heat warning systems, the widespread use of cooling centers, and the deep integration of urban heat mitigation into other local planning practices. Among other principles, effective urban heat resilience planning requires clear goals



Hundred-year-old oak trees along the Brown Foundation Promenade shade park users in Houston's Discovery Green. In addition to greening and urban forestry practices, solutions to urban heat include urban design principles and regulations that reduce heat retention. Photo by Katya Horner.

and metrics, well-defined strategies, inclusive participation, and preparation for managing uncertainty.

CHIEF URBAN HEAT OFFICERS.

An important sign of the importance of urban heat to cities and communities is the emergence of chief urban heat officers (see also [New Leadership for Local Priorities](#)). Cities including Miami, Phoenix, and Los Angeles are turning to

chief urban heat officers to identify the challenges of extreme heat risks in their communities, improve awareness among both policy makers and the public, and coordinate responses and actions to improve urban heat outcomes. Appointing a leading authority on urban heat to focus on the critical issues of heat management, adaptation, and mitigation allows cities to flexibly and comprehensively address complex

urban heat challenges over the long term.

APA has given significant attention to these issues over the last two years. APA's PAS Report 600, [Planning for Urban Heat Resilience](#), provides holistic guidance to help practitioners increase urban heat resilience equitably in the communities they serve. It provides an in-depth overview of the contributors to urban heat and equity implications and lays out an urban heat resilience framework and collection of strategies to help planners mitigate and manage heat across a variety of plans, policies, and actions. APA has also contributed to the [Plan Integration for Resilience Scorecard for Heat](#), which applies innovative plan integration techniques to communities seeking to improve urban heat outcomes. Finally, APA has developed the [Urban Heat Knowledge Base Collection](#), which collects a wide variety of local examples, best practices, case studies, and toolkits centered on building resilience to urban heat and its impacts.

The Housing Crisis, New Roommates, and Solutions



While co-living has long been a trend in the rental housing arena, cohousing and homesharing are increasingly becoming options for many looking to purchase a house, but who lack the ability to finance it on their own. Photo by JohnnyGreig/E+/Getty Images.

The evolution of the housing crisis during the COVID-19 pandemic and the period following the end of most pandemic restrictions has cast several housing trends in a new light. The rise in inflation has exacerbated a remarkably tight housing and rental market. Increased housing costs due to record demand for new homes, limited inventory, and high interest rates have reduced housing mobility and led to more people living in multigenerational households or with other

roommates. While there are some signs of loosening in the rental market, many households face eviction without any clear prospects for new housing. This may have a major impact on already rising rates of homelessness. The trends below explore the many dynamics relevant to the housing crisis.

Co-living as response to an inaccessible housing market

In the current housing crisis, homeowners are increasingly holding on

to their properties while younger and more diverse populations are largely locked out of the market. For younger buyers, significant existing debts (in the form of student loans) and rapidly rising costs (due to both price inflation and the rise in interest rates) are making homeownership untenable in the short term. Even in areas embracing the rollback of zoning and development regulations, continued supply chain problems and inflationary price pressures are disincentivizing builders and developers from

constructing new housing stock.

This lack of available and accessible housing, even for buyers beginning to approach middle age (in 2022, [the median age of first-time home buyers](#) was 36 years old), may have serious repercussions for communities across the U.S.

While [co-living](#) has long been a trend in the rental housing arena, [cohousing](#) and [homesharing](#) are increasingly becoming options for many looking to purchase a house, but who lack the ability to finance it on their own. While often similar in structure to traditional subdivision developments, these types of communities feature novel ownership structures that improve affordability and access for people who may otherwise be unable to purchase a property on their own. Planners should be prepared for the zoning and land-use impacts of these trends in co-living, cohousing, and cohabitation. For more about the potential zoning implications, check out the November 2022 issue of APA's *Zoning Practice*, "[Co-Living: An Old Idea is New Again](#)."

Multigenerational living

In the U.S., young adults today are much more likely to be living within a multigenerational household than 50 years ago. According to the [Pew Research Center](#), 17 percent of adults aged 25 to 34 live in a parent's home and an additional eight percent live in another type of multigenerational living arrangement. A variety of social and economic pressures are driving this change, including student loan debt, rising housing and rental costs, increasing costs of goods and services, and the cost of elder care. These challenges offer opportunities for planners to support [intergenerational approaches to community planning](#), including multigenerational housing.

Some communities are looking to accommodate multigenerational living through dedicated co-living housing developments. In 2023, a group of households in the village of Oak Park, Illinois, will be breaking ground on a novel intergenerational cohousing development that seeks to intentionally attract residents of

INSIGHT FROM OUR TREND SCOUTS

“In midwestern small towns, I’m starting to see corporate capital funds that have no affiliation with the area coming in and purchasing the lowest income tier of housing, trailer parks and eight-unit apartments. It’s interesting to see that corporate absentee landlord showing up and purchasing from locals.”

—Jeffrey B. Ray, AICP, JEO Consulting Group

diverse ages. Residents of the “Oak Park Commons” development will share responsibilities for maintaining common space and volunteer time and effort toward collective needs, including cleaning, cooking, and governance. With economic and societal changes driving the increase in multigenerational living, planners should be prepared for local impacts in the form of new building typologies, new amenities, and the need for new services catering to mixed and intergenerational households.

Private corporations as affordable housing landlords

Large private corporations are

playing an increasingly direct role in the purchase of affordable housing and rental stock. The sheer volume of these purchases and holdings by multibillion-dollar private equity firms has an outsized impact on the overall dynamics of market rates and available stock. In 2021 and 2022, the top private equity firms owned more than one million apartments in large, midsized, and small cities and communities across the nation. A notable recent development is increased purchases by private equity of single-family housing stock. After purchasing properties, many firms seek to maximize their profits through cost-cutting, additional fees for rental agreements and payments, and aggressive evictions

followed by major rent increases.

The planning implications of private equity's role in the purchase of local housing are significant. Should this continue to drive rent increases, evictions, and cost-cutting, communities may see a reduced stock of affordable housing and increased homelessness. Planners should be prepared to recognize these trends at the local level, and work to ensure housing accessibility and affordability for all.

Potential wave of evictions

With the expiration of federal pandemic stimulus support, the rolling back of eviction freeze policies at the federal, state, and local levels,

and rising cost pressures due to inflation, there is a significant risk of a large-scale and widespread wave of evictions across the U.S. According to the U.S. Census Department, more than eight million Americans are [not up to date](#) on their rental payments, and roughly 20 percent of renters making less than \$35,000 annually are behind on their payments. Given recent increases in the cost of food and energy and historically tight housing and rental markets, this potential wave of evictions could have major impacts on rates of homelessness in U.S. communities.

However, [recent declines in rental prices](#) driven by declining demand and increasing multifamily rental stock could help to blunt or slow the rate of evictions. Planners should be aware of and prepared to act on rising eviction rates at the local level. Planners should consider the role of zoning and land-use regulations in contributing to a tighter, more restricted, and more expensive housing market, and look to encourage housing stability, affordability, and accessibility in their communities.



As employers continue to struggle to attract office workers back to downtowns and other business districts, cities such as Washington, D.C., and New York are seriously considering the potential for commercial-to-residential conversions. Photo by Jeena Moon/*The New York Times*.

Commercial-to-residential conversions

The option to work remotely for many employees (see also [The Future of Work](#)) resulted in a devastating decrease in office space occupancy ([from 95 percent to current rates of 47 percent](#)) and turned many downtown areas to ghost towns. As cities and employers

continue to struggle to attract office workers to downtowns and other business districts, many communities are considering [commercial-to-residential conversions](#).

Since the beginning of 2020, cities in the Washington, D.C., metropolitan area have converted more than 2,000 offices to housing units. In cities that are struggling to

address the housing crisis and bring life back to vacant downtowns, this approach is extremely appealing. However, large-scale conversion of office space to residences is a complex undertaking. The cost of converting commercial and office developments into residential multifamily housing can approach or even exceed the cost of new

STILL RELEVANT FROM THE 2022 TREND REPORT

3D printed homes

Big-tech funded affordable housing

Gentrification and displacement

Increasing homelessness

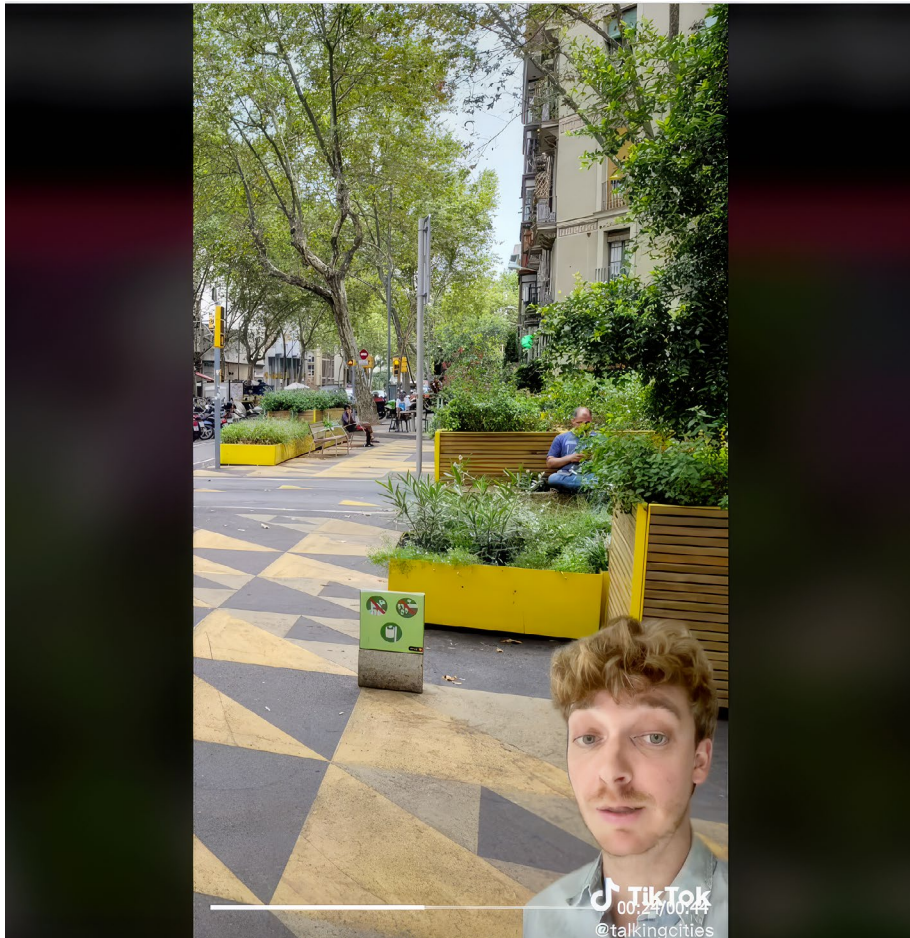
Yes in my backyard (YIMBY) movement

Zoning reform

For more about these trends, visit APA's online [Trend Universe](#).

construction. Improved conversion techniques, however, may help to bring costs down. Cities will also have to consider how office-to-residential conversions factor into their zoning reform efforts. Looking back in history, public health crises and pandemics have changed the structure and patterns of cities before. This might be the next opportunity to improve the structure of our cities again.

Social Media Use and Media Literacy



An increasing number of urban influencers have started to share videos and sketches on social media about how planning could be done better, including Paul Stout, whose popular TalkingCities TikTok account distills urban planning concepts into bite-sized videos. Photo via TikTok.

We have an increasingly complex media environment. Advertisements or sponsorships are indistinguishable from people sharing their authentic views. Misinformation is rampant in news and journalism. And social media, like most technologies, is not immune to rapid changes in preferences and formats. Social media preferences, interactions, and behaviors are also not irrelevant to planning. People, who play a part in the “attention economy,” comprise our cities

and communities. If planners ignore the ways that the social media environment operates, including both how it is detrimental to mental health and how it is increasing awareness of problems, then they are ignoring a major social aspect of the lives of the people they serve. Trends such as communities acting as influencers and the effect influencers have in communities have implications for the future of planning and how planning can be done better.

Social media influencers and impacts on communities

Cities and communities are now at the mercy of the rapidly growing social media influencer industry. This market grew from [\\$1.7 billion in 2016 to \\$9.7 billion in 2020 and had reached about \\$16.4 billion](#) by the end of 2022. An influencer is a type of social media user who uses a social media platform to market themselves, their lifestyle, or specific products to an audience of followers. Influencers have flourished under evolving social media

platforms, sharing short-form content (e.g., TikToks, Instagram reels, or YouTube shorts). Influencers can access or create niche or special interest online communities that are either geographically connected (like Nextdoor) or based on a shared topic (like Reddit).

Different kinds of influencers generate engagement in specific ways. Travel-based influencers, for example, primarily report from their travel destinations, sometimes generating hype about new tourist destinations with their online influence. This already [impacts the tourism industry](#), refocusing tourism to new destinations and creating new trends such as “must-take-selfie spots” across the world (with sometimes negative impacts on local ecology and biodiversity).

City-living influencers, on the other hand, work more at the local level. And while their local influence can be helpful to community

development processes, making them more inclusive by spurring public engagement, their spotlighting of up-and-coming neighborhoods can result in gentrification and displacement (among other impacts).

On social media, TikTok is currently [the place for open discourse on planning](#). An increasing number of urban influencers have started to share videos and sketches on how planning could be done better, advocating for public transit and walking instead of cars, and talking about teen life in the suburbs, among other things. It brings planning closer to young people and also invites them to participate.

Additionally, cities are mimicking the behavior of social media influencers to attract attention to themselves, competing with one another to be seen as authentic brands (for more on communities themselves becoming influencers, visit [APA's Trend Universe](#)).

For planners, it will be important to understand the different social media influences in their

communities and how they can be leveraged for more equitable and inclusive community development.

Social media toxicity and accountability culture

The negative effects of constant social media use are by no means hidden. It is well researched and known that social media has negative impacts on mental health: anxiety, depression, body image, and social comparison are just a

STILL RELEVANT FROM THE 2022 TREND REPORT

AI ethics

AI in everyday life

Crowdsourcing

Data protection and data privacy

Special-interest online communities

For more about these trends, visit [APA's online Trend Universe](#).

INSIGHT FROM OUR TREND SCOUTS

“Planners currently lack behavioral analysis and behavioral study. The fact that people are not centered in the planning field, but are rather justified and rationalized in our thinking, is exactly the problem. We need more behavioral analysis, more understanding of anthropological and ethnographic research methods, [and leveraging] the power of social media as research as well; social media engagement and the ways people use social media is applicable to how we do research.”

—José Richard Áviles, University of California, Berkeley

few on the list. There has been a long-standing push for stronger regulation of the business models that power social media to sell advertisements and build engagement. This should not be ignored as one factor influencing the social cohesion and well-being of community members.

But individual planners may also fall victim to constant accountability for their work. Transparency and accessibility to planning and decision-making are lauded qualities of today's digital era, but planners are now expected to manage public relations beyond their immediate community due to

social media. Anything, be it a plan or a proposed project, going viral is liable for misinterpretation or misperception. The mental health of a planner who contributed to or created a plan that is being criticized—rightfully or not—can quickly deteriorate. The trend of a toxic social media environment has impacts on how planners work.

This emphasizes even more the importance of planners becoming social media-savvy. Planning departments may need to consider developing social media strategies and staff protection programs. Planners can't change the world of social

media and its toxicity, but they can change the ways they approach and deal with it.

Social media as a planning tool for data collection

One way of harnessing social media in planning is to use it as input for data collection, public opinion scanning, and gaining general insights on community members' needs, wants, and preferences.

In the era of big data and data inputs from social media, the development of a data strategy is becoming an essential part of planning.

Especially in light of bots and unreliable data (see below), social media data needs to be looked at critically. As explained in APA's PAS Report 599, [Smart Cities: Integrating Technology, Community, and Nature](#), planners must account for the “five Vs” of big data—volume, velocity, variety, veracity/validity, and value—to successfully use it.

Bots and unreliable data

Most influencers are real-life people, but social media bots are becoming more prevalent and better at mimicking human behavior on social media platforms. Bots are an example of applied artificial intelligence that uses data on human social media users to replicate their actions and communicate with people. Bots are not exclusively negative; for example, a bot can be helpful in local government website navigation by popping up to chat with website visitors. Planners need to adequately consider the impacts of these bots. Manipulation of public conversations on social media is

especially relevant to community engagement processes.

Media literacy and critical consumption

The trust crisis (see [The Digital Era](#)) is inseparable from the so-called “War on Truth.” Algorithms and cultural differences affect news and media consumption and have contributed to a politically polarized society. Traditional formats for journalism are no longer the primary way people consume news. News reporting is now more closely intertwined with the social media environment.

Lack of media literacy and critical thinking skills has been a major accelerator of political polarization. The algorithms of social media sites such as Facebook have been found to promote posts containing misinformation and those that [incite negative reactions](#). Additionally, one survey by the Reboot Foundation—which seeks to measure the state of critical thinking globally—has seen a [26-percent drop](#) since 2018

INSIGHT FROM OUR TREND SCOUTS

“There is a burgeoning amount of both crowd sourced and citizen science data that planners are not using effectively. They need to learn how to do that. There are all sorts of challenges with understanding what big data is good for and if it is really fit for purpose. I think planners have the responsibility for doing quality control and to incentivize people to continue to provide the data.”

—Clinton J. Andrews, AICP, PE, PhD, Rutgers University



States are beginning to add media literacy requirements for school curricula to help younger generations learn to identify fact- and evidence-based news and information. Photo by Stephen Speranza/*The New York Times*.

in the number of people who said they “seek out people who tend to have different opinions than me to engage in discussion or debate.”

Most U.S. residents have not had education in bias, media messaging, and credibility. There are signals that this may be changing, especially for future generations. In 2022, [Illinois became the first state](#) to require media literacy to be taught in the classroom. [Other states](#) are exploring similar requirements. Progress on this front comes after years of research stating that combating misinformation in the digital era will require a generation of educated news consumers who can

identify fact- and evidence-based news and information.

The relevance of this trend for planners is twofold. First, planners may see fewer impacts of political polarization and misinformation in their day-to-day work if media literacy and critical thinking become common skills. Second, there is an opportunity to build relationships between the evolving news and journalism industry and planning, especially when it comes to promoting programs or projects.

Artificial Intelligence

Artificial intelligence is currently one of the fastest-growing markets within the tech sector. The availability of big data and increased computing power have made it possible to use AI applications across many industries and professions. AI is expected to be one of the biggest disruptors of the 21st century, with impacts affecting the economy, the built environment, society, and most professions, including the planning profession.

For centuries, professions have evolved with changing environments, shifting eras, new challenges, societal shifts, and technological innovations. While some professions have become obsolete or replaced by technology, others have adapted or readjusted and stayed relevant in an ever-changing world. What is different today is the pace of change that requires faster, even proactive, adjustments to changes such as new tools, processes, and required skills.

While this topic was in the Prepare timeframe of the [2022](#)

[Trend Report](#), it has become a trend we need to start acting on now. The opportunities this technology offers are endless, and so are the challenges. Biased algorithms and incomplete datasets in particular are things planners need to be aware of when dealing with AI applications.

If deployed responsibly, AI has the potential to assist planners in their work, improve existing planning processes, create more efficiencies, and allow planners to refocus their work on the human factors of planning (human interactions,



If deployed responsibly, AI has the potential to assist planners in their work, improve existing planning processes, create more efficiencies, and allow planners to refocus their work on the human factors of planning. Photo by Jiraroj Praditcharoenkul/iStock/Getty Images Plus.

connecting with community members, and related human skills). However, the use of AI also poses the risk of exacerbating existing inequalities in society if its users are

unprepared and don't understand and question the systems and algorithms in place.

AI shouldn't be used for AI's sake. The goal of using AI (and

ultimately collaborating with AI) in planning should be to improve what we are currently doing. Understanding what tasks can be done more efficiently by a machine than by a human being (e.g., processing and analyzing big datasets, or strenuous and repetitive tasks such as traffic counts) and what tasks are important to be done by a human, face-to-face with community members, are important questions that need answers. AI applications in planning range from smart city digital twins to computer vision, among others that assist the planner and make planning processes more efficient.

In addition, and most importantly, the development of intelligent systems that planners can collaborate with may help us better understand current planning processes (and their shortcomings). The discussion about AI in planning needs to start with the question of which planning processes are currently working well and which aren't. We need to make sure that we begin by improving existing processes and ensuring their outcomes are

equitable and sustainable before we can program a machine to do them for us. Therefore, it is crucial for planners to be involved in the development of AI in the planning field, to focus the discussion on challenges we want to resolve and planning goals we need to achieve, and to develop tools that can support planners in creating great communities for all.

Planners can play two roles when it comes to using AI-based tools and supporting the ethical use of AI for equitable outcomes: (1) contributing to the development of AI-based tools in the role of subject matter experts who aim to resolve community challenges and achieve community goals, and (2) being informed consumers who understand the tools being used and their shortcomings.

Since 2020, APA has prioritized this topic in our foresight work. In collaboration with experts in the field, we have developed a wide range of products that can help planners make sense of this topic and learn how to handle AI

in their work, including APA's *PAS QuickNotes* 85, "[Artificial Intelligence](#)"; *PAS Memo* 111, "[Artificial Intelligence and Planning Practice](#)"; *Zoning Practice's* "[Applying Algorithms to Land-Use Decision Making](#)"; the APA Blog post "[Demystifying Artificial Intelligence in Planning](#)"; *Planning* articles "[AI in Planning: Why Now Is the Time](#)" and "[The Art of Learning by Example](#)"; and the APA Podcast episode "[Artificial Intelligence and Urban Planning: What Planners Need to Know Now.](#)"

All APA resources on the topic and additional information from external sources are available in our [Artificial Intelligence and Planning KnowledgeBase Collection](#).

In addition, for a deeper dive and more in-depth expert discussions to better understand AI, its potential implications, challenges, and opportunities, APA launched its first [deep-dive Foresight Community](#) on "AI in Planning" in 2021. This multidisciplinary group of experts in planning, computer science, data analytics, anthropology, geography,

and engineering, among other disciplines, met 10 times over the course of one year, from June 2021 to June 2022, to discuss potential impacts from AI on the planning profession, the needs for ethical AI, and how planners can prepare for AI. The findings, conclusions, and recommendations of this Foresight Community were published in the whitepaper "[AI in Planning: Opportunities and Challenges and How to Prepare.](#)"

AI is no longer just a sci-fi concept, and AI-based tools for planning are a reality (see [PlanTech](#)). For many of us in planning this is a new and certainly not typical planning topic. But to evolve our profession, stay relevant in the future, and continue being advocates and change agents for equity, sustainability, and resilience in our communities, it is our responsibility to upskill and learn about how to effectively and equitably use and handle this disrupting technology.

Equitable, Environmentally Responsible Transportation



Cargo bikes, the latest trend in the bike world, aim to make cycling a convenient option when doing weekly grocery shopping, handling larger purchases, or transporting kids to school or daycare. Photo by Orbon Alija/E+/Getty Images.

The transportation sector may be the most disrupted planning sector. While the list of transportation-related trends from the [2022 Trend Report](#) is still as relevant as it was last year, multiple new emerging trends are impacting our streets (and rails).

Reconnecting Communities

The [2022 Trend Report](#) discussed the [removal of highways](#) where they created harm in the surrounding communities. This trend has gained further attention, and the U.S. Department of Transportation has now established the \$1 billion [Reconnecting Communities Pilot Program](#). Over five years, it will support efforts to reconnect communities that were harmed by past transportation infrastructure projects, replacing that infrastructure with projects that will bring people together and connect them with opportunities, including education, healthcare, and jobs. Funding is

available for planning grants, capital construction grants, and technical assistance. Applications were due in October 2022 and winners will be announced in early 2023.

Electric mobility and phasing out combustion-engine cars

Decarbonization and electrification of transportation were briefly discussed in the [2022 Trend Report](#), and the trend of electric mobility has been accelerating. Global developments in energy markets, the improvements of battery technology, tax rebates and other monetary incentives to purchase electric

vehicles (EVs), and the growing interest in climate action are driving the adoption of electric transportation. While this trend creates major shifts in the automobile industry, it is starting to have visible impacts on the built environment and policies as well. At least [five U.S. states](#), along with the EU, have announced that by 2035 they will ban the sale of combustion-engine cars. All new cars and light trucks sold will have to be zero-emission vehicles by then.

The end of the conventional gas station

Local, state, and federal governments are trying to catch up with the electrification trend by providing the needed [infrastructure](#). In 2022, the U.S. Department of Transportation and the U.S. Department of Energy announced the new \$5 billion [National Electric Vehicle](#)

[Infrastructure \(NEVI\) Formula Program](#), which provides funding to expand the EV charging network across the nation over five years. As a result, the nature of where and how we fuel our cars is changing. While there are different types of charging stations with different time requirements for a full charge (see APA's *PAS QuickNotes* 100, "[Electric Vehicle Charging Stations](#)"), charging an EV still takes longer than filling a gas tank. A rethinking of vehicle fueling stations toward offering EV charging facilities with parking in places where people spend time, such as homes and residential buildings, office buildings, shopping malls, and entertainment, may make conventional gas stations obsolete in the far future.

Vehicle-to-grid technology

Recent blackouts and unreliable electric grids in the U.S. highlight the urgent need to improve grid resilience so that an increasing number of EVs can be charged without interrupting energy supply

elsewhere. While a stable electric grid will be crucial for these and other electrification efforts, EVs can also help stabilize the grid. With evolving vehicle-to-grid technology, EV batteries can ultimately take on a dual purpose. In addition to powering EVs, they can be integrated into the grid and help balance peak energy times by serving as an energy storage option that can be charged or discharged as needed. In addition, they can be used as backup power supplies during power outages.

EV-charging roads

While electric charging along bus routes or on-site solar panels for streetlights are not new, roads that can directly charge EVs are the latest experiment. Multiple pilots have been going on in Europe for a few years. In 2022, the Michigan Department of Transportation (MDOT) entered a five-year agreement with the company Electreon to pilot a one-mile-long [wireless in-road EV charging system](#) in

Detroit. The system will allow EVs to charge while driving or idling.

E-bikes

In addition to electric cars, electric bikes are booming in the U.S. and across the globe. Different types of funding and tax credit programs are available at different government levels. For example, with the Connecticut Clean Air Act of May 2022, the Connecticut Hydrogen and Electric Automobile Purchase Rebate will also include [\\$500 rebates for e-bikes](#). Through its Air Quality Improvement Investments, [Colorado](#) is designating \$12 million to local and tribal governments as well as nonprofits to implement e-bike sharing or ownership programs. This also includes e-bike rebates for low- to moderate-income families. As part of its climate action program, in 2022, the [City and County of Denver](#) offered residents up to \$1,700 on an e-bike purchase at participating local bike shops and an additional \$500 for cargo e-bikes. More than 4,400 e-bike vouchers

were redeemed. The funding was completely exhausted but will most likely be renewed in 2023.

The installation and improvement of bike infrastructure—bike lane networks, protected bike lanes, and bike parking racks—has been increasing in U.S. cities over the last two decades. However, as with EVs, planners should consider the need for e-bike charging facilities throughout communities and in places where people can combine charging with other activities.

Cargo bikes

Riding a bike is not necessarily the most convenient option when doing weekly groceries, handling larger purchases, or transporting kids to school or daycare. Cargo bikes, the latest trend in the bike world, aim to resolve this issue. European cities such as [Vienna](#) and [Copenhagen](#) have been deploying cargo bike programs for years. Sales in the EU are growing at a rate of around 50 percent per year. In Copenhagen, 24 percent of families have cargo bikes.

Cargo bikes provide multiple benefits. According to [Claudia Adriazola-Steil](#), acting director of the Urban Mobility Program at the [World Resources Institute's Ross Center for Sustainable Cities](#), 15 percent of vehicles on city streets are freight vehicles, occupying 40 percent of the space, emitting 50 percent of greenhouse gas emissions, and causing 25 percent of fatalities in urban traffic. Cargo bikes could be the solution for climate-responsible freight transportation. According to the British advocacy group [Possible](#), cargo bikes cut emissions by 90 percent compared to diesel vans and by roughly one-third compared to electric vans. And cargo bikes are much more efficient. In urban areas where delays due to traffic are common, electric cargo bike deliveries were 60 percent faster and delivered almost double the number of parcels per hour compared to vans.

These are signals that make us believe that this could become a trend in the U.S. as well. Cities such as [Madison, Wisconsin](#), and

[Portland, Oregon](#), have launched e-cargo bike programs for municipal employees. The Boston Transportation Department has partnered with Cornucopia Logistics on a pilot program to carry out [cargo bike delivery services](#) between small businesses and their clients, from business to business, or from supplier to business.

The question, however, remains: how can we accommodate cargo bikes and ensure safe and efficient use? As they are bigger than conventional bikes, they might require wider cycling lanes and additional safety features to ensure not just the rider's safety but also their potential passengers' safety.

Decentralized public transit

Public transit agencies across the country have been struggling since the COVID-19 pandemic. During the first two years of the pandemic, many people shifted to other means of transportation, such as cars or bikes, due to fears of virus spread. In addition, commuter patterns

have changed, [with 58 percent of U.S. employees](#) currently having the option to work remotely either full-time or part-time. Ridership dropped and, in most places, has not fully recovered.

Public transit operations will have to adapt to a new normal; schedules built around 9-to-5 rush hours won't work in this new reality. Statistics show that not just the times of when people use public transit have changed but also the destinations. While most daily commuters used to go from residential areas to downtowns or central business districts during typical rush hours, today people take the bus to go from one neighborhood to another to have lunch with friends or to do their grocery shopping. Centralized transit systems won't be able to meet these new demands.

Free public transit for all

Many transit agencies are trying to get their riders back by lowering prices or offering transit for free. Cities across the U.S. have piloted

STILL RELEVANT FROM THE 2022 TREND REPORT

- 1-minute city
- 15-minute city
- Acknowledging and righting historical wrongs
- Autonomous delivery robots
- Autonomous vehicles
- Car-free cities
- Congestion pricing and new technologies
- Curb management and tools/technologies
- Decarbonization of transportation
- Drone deliveries
- Electric vehicles
- Hydrogen-powered transportation
- Micro mobility
- Mobility-as-a-service (MaaS)
- Rethinking public right of way
- Short-distance flight bans
- Universal basic mobility programs
- Urban air mobility

For more about these trends, visit APA's online [Trend Universe](#).

free transit, ranging from [Los Angeles](#) and [Kansas City, Missouri](#), to [Boston](#) and [Columbus, Ohio](#). These programs help riders save money and make transit more accessible to low-income residents while speeding up the boarding process and allowing for more reliable transit. Some cities offer only certain routes for free (e.g., Boston),

while others provide their entire transit system for no cost.

Some transit agencies argue that operations without a fare are more economical than with fares. Operation and maintenance of turnstiles, fare boxes, and payment methods can be expensive and, especially in smaller cities, cost more than the revenue made through fares.

Last summer, Germany piloted a nine-euro-per-month ticket that allowed riders to use any public transit across the country, including buses, metro, and regional trains. While the use of transit increased during this pilot, automobile traffic barely changed. Starting in the spring of 2023, the ticket will be updated to 49 euros per month to still provide an attractive transit offering without putting too much burden on taxpayers.

Some of these pilots show that the price of transit is not the main reason why some people still prefer driving to using transit. Factors such as the first-mile/last-mile issue and inconvenient schedules, frequencies, or routes play a larger role in such decisions. Either way, free transit is a positive step toward making cities more accessible and inclusive for all.

Younger Generations and Social Challenges



More teachers are needed in the U.S., as retirements and burnout caused by the COVID-19 pandemic have exacerbated a preexisting teacher shortage in public education. Photo by Glen Stubbe/ZUMA Press Inc/Alamy.

Youth are faced with the legacy of current decisions, but they can also make the vision for the future happen. Generations [Z](#) and [Alpha](#) are dealing with global issues that are covered elsewhere in this report—climate change and biodiversity loss, economic restructuring, and the future of work, social media and digital life—but also face unique social challenges related to their overall feelings of empowerment and the educational foundations of their

lives. Youth disillusionment, the increased politicization of education, a shortage of educators, and the question of school safety are all trends that may impact the ability and motivation of younger generations to address global threats.

Youth disillusionment and activism

The [World Economic Forum](#) has identified youth disengagement with existing economic, political, and social structures as a global

risk. Around the world, youth today are burdened with both a climate crisis and a pandemic. Teenagers faced with the uncertainty of the planet's ability to support human existence are suffering significant [climate anxiety](#). Initial studies already show that COVID-19 has negatively impacted students' academic learning levels and mental health. It is too soon to tell what the effects of masking and distance education on socialization will be. And in the U.S., school shootings are an additional societal threat.

Disillusionment could galvanize youth movements for social change, or it could stunt entire generations.

Youth preferences and behaviors are informing power dynamics, social movements, and economic restructuring. [Early estimates](#) from the 2022 midterm elections report that voter turnout was around 27 percent for people ages 18–29. Though this is slightly down from 31 percent in the 2018 midterm elections, it remains above the average of the previous two decades. In September 2022, a group of young climate activists in Canada brought [a landmark lawsuit](#) against the Ontario government for its weakened climate target. Both are evidence that there is still momentum in the trend of youth movements for social change discussed in the [2022 Trend Report](#). Refer to [The Future of Work](#) to see some additional trends that are impacted by youth preferences.

Politicization of education

Political polarization is seeping into the public school system. Arguments over pedagogical approaches and school curricula, such as using critical race theory or other equity-related frameworks, are coming to a boil in meetings held by local school councils or parent-teacher alliances. Similar to the increased beratement and chaos that planners are experiencing in public meetings, educators and administrators are expected to facilitate these discussions at the risk of burnout or negative effects on their mental health. This trend is potentially furthering the privatization of education, with caregivers pulling children from schools due to support of or opposition to public schools' coverage of certain topics. For example, in 2021, Florida expanded its [private school voucher program](#), which diverts taxpayer money from public schools to private schools. While this program can support low-income families and students with disabilities, it inherently undercuts the public school system and investment in

public schools as valuable social infrastructure for communities.

School safety and security

Planners have been involved in deterring crime in cities since the 1970s. Today, planners could play a role in addressing mass violence and terrorism in public spaces, starting with one of our most vulnerable populations: students in schools.

Schools as sites of gun violence are indicative of social conditions that contribute to mental health challenges and extremist views, the marginalization of youth, and the number of guns ([120.5 privately owned firearms per 100 people](#)) in the U.S. (see [Political Shifts in Public Safety and Security](#) and [Policy Impacts on Health](#)). Studies have shown that the U.S. population, in general, lives in fear of mass violence at public events, in stores, and in religious places of worship. Today's students and future generations are also at risk of becoming desensitized to mass violence. In July 2022, the [Pew Research Center](#)

INSIGHT FROM OUR TREND SCOUTS

“What I’m seeing in school districts is that they are trying to react to the political pressures. A lot of children nationwide are facing teacher shortages and what does that mean for education? Empty classrooms, kids being babysat throughout the day and not having qualified, certified teachers in the classroom.”

—Amber Dickerson, AICP, Urban Planning Innovations, LLC

reported that security procedures—such as active shooter drills, security technologies, and security staff—have become more widespread in

the last few years. The involvement of law enforcement in organizing drills, drafting safety plans, and completing audits of school facilities is the most notable [policy trend](#). Landscape architecture approaches, such as hardening of facilities, are still underexplored but emerging as a trend in school safety.

Teacher shortages

The politicization of education and concerns about school safety felt by educators and school staff are two factors that contribute to the persisting trend of teacher shortages. While there is no national database tracking teacher shortages, reports from states and school districts across the country portray the picture. High and rising teacher shortages in public education are a problem that predates the pandemic. According to the [Economic Policy Institute](#), before the pandemic, many teachers eligible to retire remained in the profession. Vulnerability to COVID-19 and other health concerns pushed

STILL RELEVANT FROM THE 2022 TREND REPORT

Political polarization
Public trust
Youth movements for social change

For more about these trends, visit APA's online [Trend Universe](#).

them into retirement, exacerbating teacher shortages. As a result, some schools are switching to four-day school weeks and asking people with no teaching experience to teach.

Affordable housing for teachers and school workers is one area where planners can make meaningful change, as well as contributing to increasing safety in schools and generally supporting the strength of public schools as social infrastructure.

The trends we need to prepare for

As the world is becoming more digital, planners need to prepare. New concepts that have the potential to disrupt our work and our communities range from **blockchain**, **cryptocurrency**, and **NFTs** to the phenomenon of the **metaverse** and the idea of **hybrid lifestyles**. Planners in hiring or supervising positions will also have to embrace new expectations of **future employees**. Furthermore, it is uncertain what the future of **retail** and **economic development** will look like. One thing is certain: now is the time to be at the table where these concepts are being discussed and to actively shape what these futures might look like. Check out the “how to prepare” questions in each of the trend clusters to start the conversation.



Blockchain, Crypto, and NFTs



Crypto mining, or the creation and validation of new cryptocurrency coins through solving complex mathematical equations, uses enormous amounts of energy and water and can have other nuisance impacts on communities. Photo by LightFieldStudios/iStock/Getty Images Plus.

Blockchain is a decentralized digital record-keeping and ledger system that tracks transactions. It takes inputs from multiple sources and stores them across multiple computers, resulting in a transparent and accessible shared system that is invulnerable to unwanted data modification. Like many technologies, the value of the application is dependent on the creators and users. Blockchain has high potential to be an infrastructure for building trust in data and digitalization, but

it is important to remember it is not inherently an infrastructure for truth. Cryptocurrency and non-fungible tokens (NFTs) are related topics that are gaining more importance for planners as well.

Blockchain applications in cities

Blockchain has many potential use cases in cities, but these applications are not widespread yet. Potential applications in planning were outlined in APA's *PAS QuickNotes* 100,

“[Blockchain for Planners](#),” and the 2022 *Planning* article “[Your Guide to NFTs, Cryptocurrency, and the Blockchain](#).” Records management and community engagement are two core planning activities that can use blockchain, but many blockchain experts and urban planners are finding additional cases where blockchain could help improve planning practices.

The rapid evolution of the transportation sector and technologies makes this one obvious target for blockchain applications.

Blockchain has the potential to facilitate multimodal transit due to its capability to run across multiple smart devices securely. Transit users would be able to purchase multiple passes across multiple services more smoothly and efficiently. Blockchain-integrated autonomous vehicles could accommodate the large amount of data that increasingly complex cars are now producing, especially regarding vehicle-to-vehicle interactions. Another possible use is integrating cryptocurrency to pay for transit. And in communities with shared-use micromobility, blockchain could help rebalance bike and scooter distribution across the system.

In the environmental realm, blockchain may be useful for managing climate action and mitigation activities. It could assist in administering funding for biodiversity solutions or tracking greenhouse gas emissions to monitor progress on goals. In terms of green projects, communities could use blockchain to manage tree permitting or energy systems, such as electricity

marketplaces, smart contracts for renewable energy, and microgrid projects. Despite this, the environmental cost of powering blockchain is still controversial (as discussed below).

Blockchain technologies can also improve city governance. It could facilitate archiving and geocoding of historic planning information (see [Digital Permanence](#)) that can keep planners accountable and provide quality assurance. Community infrastructure may benefit from decentralized systems of financing that blockchain technologies can support, and blockchain could also assist in documenting functions such as [land rights allocation](#), the [development of parklets or on-street dining](#), and [homelessness services](#). And blockchain could take smart city dashboards, which visualize performance on policy areas such as mobility and energy efficiency, to the next level, enabling “[people’s smart city dashboards](#)” powered by community-led governance.

Another potential use of blockchain is to [track and control](#)

Prepare for Blockchain

Explore these key questions.

1

WHY might blockchain persist (or disappear) in the next 10 to 15 years?

WHAT external factors may promote or threaten the development of blockchain in the future?

2

WHAT are the potential benefits and tradeoffs of using blockchain to improve community services (e.g., public transit) and planning processes (e.g., data collection)?

WHAT existing gaps in planning work can blockchain fill?

3

HOW can I protect the communities I serve from the volatile nature of cryptocurrency?

HOW might a community react to blockchain applications if they associate it with cryptocurrency?

residents’ spending of the next generation of “conditional money,” or funds that governments distribute with means testing (e.g., universal basic income or universal basic mobility funds). Government aid already sometimes comes with conditions for the recipient’s spending.

Now, with blockchain and cryptocurrency, money itself can adopt parameters for how funds are used. However, this may limit the success of these programs in building social well-being and trust.

For each blockchain application, there are risks and concerns.

The economic viability of this technology is still underexplored. Critics condemn blockchain’s high energy consumption. Given its minimal applications, whether entire communities can scale blockchain to their needs is also still a question. Finally, blockchain promises

security, but uncertainties about whether it is truly incorruptible and able to provide user privacy requires some cautiousness from early adopters.

Cryptocurrency and crypto mining

Cryptocurrency (e.g., Bitcoin) is a digital alternative to traditional currency. Crypto mining, or the creation and validation of new crypto coins through solving complex mathematical equations, uses enormous amounts of energy and water (for cooling). Mining one bitcoin takes an estimated 1,449 kWh—about two months' worth of energy use for an average U.S. household. As of July 2022, [global Bitcoin mining energy use](#) equaled that of the entire country of Argentina. Crypto-mining facilities are often located in regions with cheap local electricity. However, minimal labor requirements mean they don't generate new jobs for the region. Residents lose out on cheap energy prices and must turn

to more expensive options to avoid grid overload. And the noise these facilities generate can constitute a significant nuisance.

The federal government does not currently monitor cryptocurrency's energy consumption. A lack of broad regulation also means that when one locality adopts [crypto-mining regulations](#), crypto mine operators can easily move to other nearby areas.

Crypto winter and increasing regulation

Cryptocurrency has always been associated with volatility and uncertainty. The value of a single Bitcoin hit an all-time high in November 2021, but by June 2022 had fallen 70 percent. This steep fall and period of continuing low value is known as a "[crypto winter](#)." The current crypto winter—not the first, but already one of the worst—is predicted to last through 2023. FTX, a major crypto exchange, crashed in November 2022—a little over three years after its founding. Coinbase,

another major exchange, saw very few transactions when it opened its NFT marketplace in spring 2022. While this may just be a temporary setback for crypto, it could also signal a larger demise. Because of this, people are wary of the crypto marketplace.

More crypto regulation and legislation is afoot. The Securities and Exchange Commission is seeking to better regulate crypto companies and establish new rules. Comprehensive crypto legislation proposing more federal regulatory authority over crypto [was introduced in Congress](#) in the summer of 2022, but whether this bill will gain traction is still up in the air.

Non-fungible tokens (NFTs)

NFTs are a tool to manage, catalogue, and record information and intellectual property. NFTs are tokens, or units of data, stored on a blockchain that individually represent a one-of-a-kind digital item. Many databases that are relevant to the work of planners—land

STILL RELEVANT FROM THE 2022 TREND REPORT

Digital emissions
Smart cities

For more about these trends, visit APA's online [Trend Universe](#)

records, tax information, zoning and regulation, and demographic data—require extensive data collection and maintenance, which can be costly. Proponents of blockchain technology and the use of NFTs argue that they can make working with these databases a more efficient process.

Shifting the responsibility from governments for tracking and managing this information, however, means putting it in the hands of someone with the required technical proficiency who may not be aware of when and how planners should access or use this information. Planners will need to forge relationships with those technicians

if blockchain and NFTs find their way into local government and planning work.

Fractional ownership

[Fractional ownership](#) (F-NFTs) is a blockchain-powered investment approach that splits the cost of an asset between individual shareholders. Fractional ownership is managed by smart contracts. As the current crypto winter marches on, fractional ownership may be a remedy that increases transactions on the suffering NFT marketplace, thus improving asset liquidity.

Currently, the most relevant use of fractional ownership in the planning sphere is fractional ownership of buildings and property developments. Fractional property ownership could democratize access to real estate investment, increasing collective ownership as part of the larger sharing-economy trend and erasing the idea that NFTs are assets for the privileged few.

An Upside-Down Economy



Business districts and downtowns are struggling following the COVID-19 pandemic and the end of pandemic-era restrictions. With many former customers of stores, restaurants, and service industries catering to office workers now working remotely, downtown vacancies have soared in San Francisco and other cities. Photo by Aaron Wojack/*The New York Times*.

The COVID-19 pandemic continues to cast a long shadow on the global economy. A broader restructuring of the economy, already underway pre-pandemic, has been greatly accelerated by COVID disruption. In some industries (especially the tech sector) a reassessment and reevaluation are well underway after possible overextension in 2020 and 2021. Yet other trends are leading to major repercussions across industries and within cities and communities.

Tech-sector pullback

After a pandemic-fueled boom, the tech sector is coming back down to earth. Major tech companies such as Meta, Amazon, and Microsoft have undertaken [major layoffs in 2022](#) after hiring sprees and major growth during the COVID-19 pandemic. The tech pullback is among the most significant in the modern history of the sector, following the dot-com bust of the early 2000s. Industry analysts have identified rising interest rates, rising costs, and

pandemic-era overextension as critical factors fueling the tech-sector declines. This isn't just affecting the biggest tech companies, as investors have pulled back from start-ups and other mid-range tech companies that have struggled to secure consistent profits over the last decade. At this point, it is unclear how this sector will perform over the coming months and years. For planners, impacts of the tech-sector pullback may include economic declines and changes in housing dynamics in communities

heavily reliant on the major players in the tech industry.

U.S. manufacturing resurgence

The U.S. is [experiencing a boom in manufacturing](#) fueled by a strong dollar, a desire by many companies to simplify logistics and on-shore their production, the availability of skilled workers and raw materials, and crucially, a series of enticing legislative actions from the federal government. The recent infrastructure bill, the Inflation Reduction Act, and specialized legislation such as the CHIPS Act (incentivizing domestic production of semiconductors) have all contributed to an environment favoring more local manufacturing, especially of complex technological goods. This is especially notable in high-growth fields such as electric vehicle production, wind and solar energy, and semiconductor production. For planners, the manufacturing resurgence could be especially impactful in places experiencing high rates of

growth and economic development (for example, [Georgia](#)), as well as regions such as the [Rust Belt](#), which retains a historic manufacturing base and has had some recent success in attracting new investment.

White-collar automation

Automation has broken into the mainstream over the last year, especially in the form of AI-produced art tools such as [DALL-E](#)



An AI-generated variation on a self-portrait of Salvador Dalí produced by automation art tool DALL-E 2. As automation becomes more sophisticated and mainstream, it is moving into white-collar jobs. Image by OpenAI DALL-E 2.

INSIGHT FROM OUR TREND SCOUTS

“Work from home has completely changed the way we live and work and move in cities. Remote work is not going anywhere at all. You already see it with the amount of [vacant] office space we have in cities. Downtowns that are mostly commercial are having a really hard time, and there is a big shift toward needing more residential in downtowns. I think that has enormous repercussions.”

—Nico Larco, AIA, University of Oregon

and advanced language and writing tools such as [ChatGPT](#). While automation has been a major element in manufacturing for decades, recent trends are pointing to its increasing use in traditionally white-collar fields. This could signal a major change in a variety of industries, including administrative work, government and public-sector work, customer support, communications and marketing, journalism, software development, and the legal industry. [Some analysts believe the disruption could be significant](#) as AI and automation tools become more advanced and may rival the massive changes driven by the introduction

of computers, software, and networking technology.

For planners, automation in key industries (including planning itself) could have major repercussions for people and communities. Planners should prepare for changes in areas reliant on office and knowledge work (such as downtowns and central business districts), potential disruptions to employment rates in white-collar industries, and potential impacts on areas such as housing and transportation. For more on the impacts of automation and AI in communities and within planning, see [Deep Dive: Artificial Intelligence](#).

Declining downtowns and business districts

Business districts and downtowns are struggling following the COVID-19 pandemic and the end of pandemic-era restrictions. With remote work policies seemingly here to stay, many offices remain sparsely filled, leading to major economic challenges in downtowns and business districts in communities across the country. Storefronts, restaurants, and service industries catering to office workers are reliant on a critical mass of potential customers. With many of those customers now working remotely, downtown vacancies have

soared. Beyond the direct impacts to employment and safety in these areas, the commercial real estate market appears to be approaching a major crisis, as tenants are declining to renew leases. Many cities are pursuing a dual strategy by actively working to retain and attract employers to their main business hubs, while also actively exploring alternatives (such as commercial-to-residential conversions; see [The Housing Crisis, New Roommates, and Solutions](#)) as they

grapple with concurrent housing and affordability crises.

The Great Reflection and increasing entrepreneurship

The COVID-19 pandemic has played a major role in fueling a recent boom in U.S. entrepreneurship dubbed the “Great Reflection.” [2021 saw a record 5.4 million business applications](#), with another record likely in 2022. The largest jumps in business formation were in the field of e-commerce and online retail, with logistics, warehousing, transportation, and service businesses also seeing significant increases compared with previous years. Likely factors contributing to this rise in entrepreneurship include high-speed broadband and internet access, availability and affordability of software, networking and end-to-end business tools, extra time at home during the COVID-19 pandemic, pandemic-era financial assistance from the federal government, and the ability to form a business

Prepare for the Upside-Down Economy

Explore these key questions.

1

WHY might the economic restructuring driven by the COVID-19 pandemic play a role in how planners consider economic change in their communities?

without the need for a physical workspace outside the home.

The creator economy

The rise of second- and third-generation social media platforms has led to the massive growth of an

2

WHAT role might the manufacturing resurgence play in land-use changes and economic prospects in cities and communities?

WHAT does this mean for communities that have experienced manufacturing declines, but still retain critical infrastructure to support this resurgence?

economy of independent content creators. Along with third-party tools and services that assist with content creation (such as video production and finances), this new “creator economy” is allowing content creators to build reliable revenue streams in a variety of fields

3

HOW can planners consider the growth of both entrepreneurship and the creator economy in local plans and policies?

HOW might these trends impact local economies, the need for local amenities, or the preferences of residents?

such as vlogging, writing, education and skill building, and gaming. There is significant potential for the creator economy to continue to disrupt traditional industries.

STILL RELEVANT FROM THE 2022 TREND REPORT

- Everything as a service
- Gig work and polyworkers
- Pent-up demand
- The return of company towns
- Robotics and automation

Learn more about these trends at APA's online [Trend Universe](#).

The Metaverse



The company ARTECHOUSE produces technology-driven interactive installations and exhibitions at its Miami Beach, New York City, and Washington, D.C., locations. These new experiential spaces use sensors, smart cameras, real-time mapping, augmented reality, and other technologies so that digital elements can respond to people as they move. Photo courtesy ARTECHOUSE.

The idea of the metaverse has exploded in popularity over the last year, emerging as the biggest thing since smartphones. Today, only fragments of what will eventually become the metaverse exist. Its success depends upon whether the underlying technological infrastructure creates a truly immersive experience for users. Mass-market adoption of the metaverse will likely require more investment in other emerging technologies, such as Web 3.0 and blockchain.

Such investments by corporations, venture capitalists, start-ups, and others have more than doubled between 2021 and 2022 (from [\\$57 billion to \\$120 billion](#) and counting).

halls, and visit digital public spaces anywhere in the world. As the foundation of the metaverse, many digital spaces have been created, and markets have formed around them and have been growing substantially over the last year.

Digital spaces and markets

The idea of the metaverse is to provide digital spaces such as offices, stores, or entire cities. These digital spaces enable people (appearing as avatars) to browse shelves of retail stores, enter virtual lecture

Today, companies such as Nike and Gucci have launched virtual digital stores and showrooms in the metaverse using the platform provided by Roblox. In addition to New York, Paris, and other city's fashion weeks, we now have a [metaverse fashion week](#). Additionally,

companies like [Sandbox](#) and [Decentraland](#) are selling digital real estate, and companies like Microsoft are investing in [Mesh](#), a product that creates 3D-rendered virtual workspaces to conduct meetings and work collaboratively online. Even the [funeral of Queen Elizabeth II](#) was hosted in Decentraland's metaverse and people from across the globe were able to attend.

More oddly, several food and beverage companies are now available in the metaverse as well, including Burger King, Chipotle, Jack Daniels, and Heineken. A [recent](#)

[PwC survey](#) showed that 82 percent of participating food and beverage companies see the metaverse as part of their business strategy in the next three years. Applications range from virtual employee trainings to virtual experimentation for physical restaurant designs, product placements and advertisement, and content sharing with customers, among others. Cheers and bon appétit—virtually!

Public services in the metaverse

More and more cities and entire countries are offering public services in the metaverse. Barbados announced in 2021 it is planning to open a [metaverse embassy](#), offering all embassy services in the virtual world—worldwide. Austria's postal service, Österreichische Post, opened the world's [first postal service](#) in the metaverse, selling crypto stamp art—the first virtual stamps for collectors.

The global race to be a part of the metaverse or become a

Prepare for the Metaverse

Explore these key questions.

- 1 WHY might the evolution of the metaverse impact the built environment and behaviors in my community?
- 2 WHAT will be the impact of people living, playing, working, and socializing in the metaverse on development patterns, built form, and planning in general?
- 3 HOW can I plan for people that may not have access to the metaverse or are not tech-savvy enough to use it?

metaverse hub—a center that supports the development of the metaverse and technologies that support the metaverse—is on. The cities of Shanghai and Guangzhou in China have plans to invest millions of dollars in technologies and R&D required to build and boost metaverse development. Similarly, the City of Dubai is working on its [“Dubai Metaverse Strategy”](#) to become one of the major global metaverse hubs. These and other

cities are planning to attract or create private companies that will help develop the metaverse. Additionally, they will also create thousands of virtual jobs for augmented reality (AR) and virtual reality (VR) engineers, digital architects and planners, and NFT experts. In the U.S., [Santa Monica, California](#), was the first city to enter the metaverse, offering tourists and residents a virtual way to experience its downtown, including underutilized

spaces. The [Miami Gardens, Florida, metaverse](#) offers opportunities to view various landmarks and amenities, such as parks and senior centers.

With more public services moving into the metaverse, more people will depend on these virtual spaces. As in the real world, they will have to be accessible for all, including people who are not digital tech-savvy, people with physical or mental disabilities, and people who

STILL RELEVANT FROM THE 2022 TREND REPORT

Diminished reality
The metaverse
(Smart) city digital twins
Virtual reality and game engines

For more about these trends, visit APA's online [Trend Universe](#).

don't have internet access or devices to connect.

Liminal spaces

The concept of liminal spaces refers to transforming real-world spaces into interactive environments by blending the physical and digital realms. These new experiential spaces use sensors, smart cameras, real-time mapping, augmented reality, and other technologies so that digital elements can respond to people as they move. Such experiences are still a niche concept and are mostly adopted by museums, art galleries, and the fashion industry. For instance, the company [ARTEC-HOUSE](#) produces technology-driven interactive installations and exhibitions at its Miami Beach, New York City, and Washington, D.C., locations. Similarly, [The Shed](#)—a cultural institution that produces innovative art—partnered with High Line Art and Acute Art in New York to develop “[The Looking Glass](#),” a collection of artworks that is invisible to the naked eye but comes to life



The global race for cities to be a part of the metaverse is on. In September 2022, Seoul launched a beta version of Metaverse Seoul, the first step towards its goal of establishing a metaverse environment for all administrative services, including economy, education, culture, and tourism, by 2026. Photos by Seoul City Government.

on a phone's screen when the camera targets the right spot.

Planners can use this technology to augment public spaces and

bring community-led change by making it part of creative place-making processes. Liminal spaces can also be used in community

exercises, such as using apps to help people visualize changes to the built environment by modifying or adding specific signage, tree canopies, and street furniture.

The metaverse as a planning tool

As mentioned in the [2022 Trend Report](#) and described in *PAS QuickNotes* 89, “[Smart City Digital Twins](#),” planners can use digital twins to experiment in virtual versions of their cities. Many communities around the country and globe are already doing this. Digital twins are the building blocks of the metaverse.

Creating a digital twin of one's city in the metaverse opens up new opportunities for planning. The metaverse version of a city can become a laboratory for planners and community members, in which virtual experiments run no risk of harming anyone in the real world. Furthermore, the metaverse can become a place for virtual community engagement. People will be able

to make more informed decisions about proposed plans and projects because they will be able to not just view 3D models but experience and feel the proposed changes, seeing for themselves how it feels to be in a certain type of built environment and how changing some attributes would change their perceptions.

Smart glasses

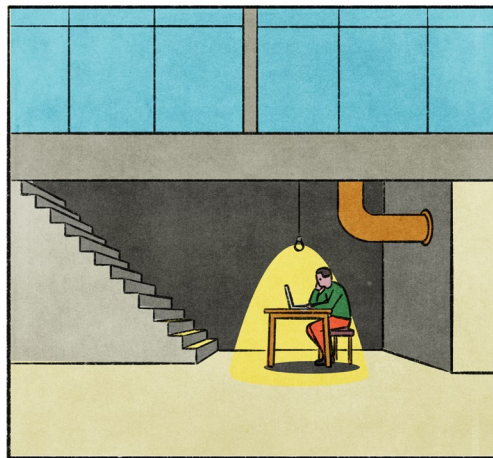
Currently, people use VR goggles for the metaverse experience. With enough investment in technology, smart glasses could be the next evolution on that frontier and replace VR goggles as essential hardware to experience the future metaverse. The global smart glasses market value is expected to reach [\\$15.1 billion by 2030](#), and it is anticipated that most of that growth will originate in North America. The smart glasses available today are cumbersome, expensive, and not technologically advanced. The metaverse will have a hard time becoming mainstream unless this changes.

The Futures of Planners and the Metaverse

Will planners be the leaders of the future or will the profession become irrelevant? Illustrations by Klaus Kremmerz

The metaverse and digital planning become mainstream (the virtual world and real world are coexisting).

Planners continue to use traditional methods and ignore new technologies.



**SCENARIO D
PLANNING UNDER THREAT**

Planners fail to adapt to changing behaviors and community needs in a hybrid world

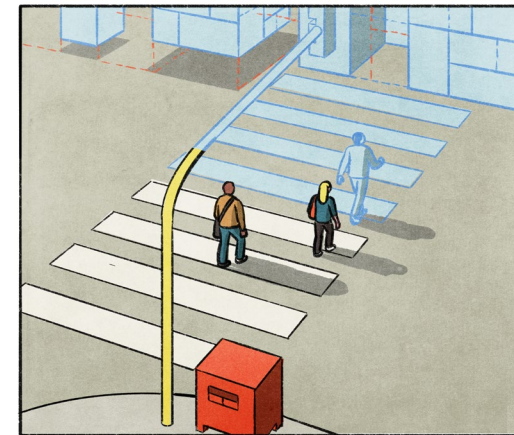
Other professions who adapted to a hybrid world are tasked with planning for the future of hybrid communities

**SCENARIO A
PLANNING FOR A HYBRID WORLD**

Digital planning, including experiments in the metaverse (digital city twins), are mainstream

Planning processes are more efficient, and planners focus their time on human interactions

Planners plan for a hybrid world, considering the built environment and the metaverse



Planners upskill and fully integrate new technologies into their work.



**SCENARIO C
BUSINESS AS USUAL**

The metaverse didn't take off, staying a niche phenomenon only in use by certain groups

There are no significant changes in how planners do their work

**SCENARIO B
PLANNERS ARE INNOVATORS**

Planning is one of the few professions that uses the metaverse to experiment in the virtual world

Planning is seen as a tech-advanced profession that innovates

Plans are more resilient because they can be piloted digitally before real-world implementation

Planning is more people-centric because digital planning frees up time for planners to focus on their community members



The metaverse stays niche (only of interest to certain industries or professions).

Scenarios 2040

Amazonification and Other Retail Trends



In a changing retail world, digitally native e-commerce brands such as Warby Parker are looking to establish themselves outside of the Amazon footprint by seeking out physical storefronts and pop-up locations. Photo by rblfmr/Shutterstock.

The rise of e-commerce, combined with the accelerating effects of the COVID-19 pandemic, has led to a large-scale restructuring of how people shop. Given the major role that retail plays at the local level, the impacts that retail development has on local land use, and the importance of retail employment in the current job market, the reordering of retail is a major development that planners should be prepared for. However, even with the major changes

happening in the retail and commercial landscapes, there has been something of a recent shift to pre-COVID trends. This moderate pullback to the previous status quo may itself become a trend, highlighting the uncertain ebb and flow of technological change, social pressures, and consumer preferences. The following trends explore this dynamic in more detail.

continued growth in the e-commerce sector, the waning of COVID-19 and pandemic restrictions has caused some major e-commerce retailers to reevaluate their plans for growth. E-commerce stocks have declined considerably over the past year, as consumers have reduced spending and investors have pulled back.

As discussed in the [2022 Trend Report](#), Amazon, the leading U.S. e-commerce retailer, and others have invested heavily in warehouse and distribution center

Is e-commerce declining?

While long-term trends point to

development as they sought to reduce delivery times. The impacts from increasing delivery truck activity on local streets are leading to poor air quality, considerably more traffic congestion, and extra stress on local infrastructure. In many cases, these facilities are located in working-class and underserved neighborhoods that already struggle with poor health outcomes and issues related to environmental justice.

More recently however, Amazon has sought to sublease millions of square feet of its distribution

center space as online sales have failed to keep pace with its expansion. Since November 2022, Amazon has laid off thousands of workers within its retail and technology services divisions, and [more layoffs are expected for 2023](#). Planners should be prepared for more disruption, especially as it relates to land use, transportation, and impacts on local employment, due to volatility in both the e-commerce and tech industries.

Brand marketplaces and digitally native brands

Many brands are seeking to break away from the centralized hold that e-commerce giants like Amazon hold over the online retail marketplace. This is largely taking the form of brands opening their own online and physical storefronts to better control the experience of potential customers and to capture a larger share of revenues. In some cases, retailers are entering into open competition with Amazon by making their



The Los Angeles area has the nation's largest concentration of warehouses and some of the worst air pollution in the country. Increasing delivery truck activity from large-scale fulfillment centers is leading to poor air quality, more traffic congestion, and extra stress on local infrastructure in many communities. Photo by Philip Cheung/*The New York Times*.

own online platforms available for third-party brands. There are significant risks to this strategy, largely due to the costs of shipping, distribution, and fulfillment. So-called “[digitally native brands](#),”

brands with little if any physical presence, are also looking to establish themselves outside of the Amazon footprint. In some cases, this is taking the form of digital brands seeking out physical

storefronts and pop-up locations. This potential shift back toward physical retail space is a notable counter to the declines among established physical retailers over the last decade.

STILL RELEVANT FROM THE 2022 TREND REPORT

3D-printed anything
E-commerce
Everything as a service
Gigworkers and polyworkers

For more about these trends, visit APA's online [Trend Universe](#).

Pent-up demand and shipping disruptions

Continued pent-up demand as a result of the COVID-19 pandemic and other global disruptors (such as the war in Ukraine), in concert with increasing wages and staffing shortages, is helping to drive inflationary trends and shortages of consumer goods, raw materials, and construction materials. Concurrently, disruptions in

global logistics and shipping are spurring major retailers to develop their own integrated storage and long-distance shipping solutions. E-commerce and brick-and-mortar retailers such as Amazon, Walmart, and Target are increasingly looking toward consolidating shipping operations, including cargo ships and aircraft, to protect their own supply chains in the face of global disruption.



The COVID-19 pandemic was hard on shopping malls. Only about 700 malls remain in the U.S., down from 2,500 in the 1980s, and many industry analysts believe that hundreds more are likely to close within the next decade. Photo by 010110010101101/Shutterstock.

Prepare for the Future of Retail

Explore these key questions.

1

WHY is the future of retail and the evolution of e-commerce important in the context of land use, transportation, and other forms of community planning?

2

WHAT are the potential land-use implications of a significant pullback in fulfillment center development?

3

HOW can we prepare communities for the continued decline of shopping malls, and how can we better accommodate the potential reuse or redevelopment of these sites to meet community needs?

The end of shopping malls

In the 1980s, there were about 2,500 shopping malls in the U.S. Today, only about 700 malls remain, and many industry analysts believe that hundreds more are likely to close within the next decade. Plans for the revitalization of malls and the integration of other uses have proliferated since the Great Recession, and the existential risks to shopping

malls accelerated once again during the COVID-19 pandemic. While the adaptive reuse of malls as community hubs, office space, educational facilities, and a wide array of other uses continues, trends today seem to be shifting toward wholesale demolition and redevelopment. Shopping mall sites tend to be well located within existing transportation networks, making these sites

potentially advantageous as fulfillment and distribution centers, housing, and new (often outdoor) commercial activity sites. However, amidst a potential pullback among e-commerce retailers in establishing new distribution centers, as well as an ongoing housing crunch driven by high prices and high interest rates, the future of malls remains cloudy.

The Future of Work



More than half of U.S. employees (about 92 million people) now have the option to work remotely for all or part of the week, transforming their expectations of what the workplace of the future will look like. Employers will need to adjust and change accordingly. Photo by AnnaStills/iStock/Getty Images Plus.

The COVID-19 pandemic forced us to undertake workplace experiments we never would have dared to dream of. And, surprisingly, both employees and employers found many benefits in the resulting changes. [Employees started prioritizing a healthy work-life balance](#) and employers realized that happy and healthy employees are more productive. However, the new normal is not yet clearly defined, not

everyone is comfortable with certain changes, and the future of work could be anything at this point. In addition, younger generations have their own ideas and preferences about what a healthy work environment should look like. Employee empowerment and new expectations are the main themes.

Employees who gained more flexibility and other benefits during the darkest times of the COVID-19 pandemic don't want to give up their new routines and behaviors now that the pandemic is almost over. They don't want to go back to the ways

things used to be. People's expectations are changing, and employees want to have a say in what their workplaces of the future will look like. If employers want to find motivated and talented staff, they will have to adjust to these new expectations and change accordingly.

Working from anywhere and amenity-driven relocation

According to a [2022 McKinsey study](#), 58 percent of employees in the U.S. (about 92 million people) now have the option to work

remotely for all or part of the week, 35 percent can work remotely on a full-time basis, and 23 percent can work remotely part-time or on occasion. This has impacts on commuter patterns and related transportation systems (see [Equitable, Environmentally Responsible Transportation](#)), office space occupancy rates (see [An Upside-Down Economy](#)), and surrounding businesses such as restaurants. In addition, the option to work remotely allows people to choose where they live based on preferred amenities and factors, such as quality of life, connection to nature, or affordability, instead of having to live close to their job. While the suburbs seem to be the “winner” of this trend, many rural communities—especially those with broadband internet access—experienced massive influxes of remote workers as well. The challenge for planners will be to prevent gentrification and displacement in these popular places, ensure sustainable integration of newcomers, and accommodate everyone in inclusive and equitable ways.

Digital nomads

With the option to work remotely, some people moved out of cities and into the countryside to be closer to nature, while others relocated to different countries, enjoying la dolce vita in Italy or the ocean breeze on a Caribbean island while working their U.S.-based jobs. Almost 50 countries across the globe now offer so-called [digital nomad visas](#) for these expat remote workers. About one-third of digital nomads don't stay for long, moving to different countries every one to three months. About half of them are in their thirties.

According to the [World Economic Forum](#), currently there are 35 million digital nomads working around the world. Most of them choose the U.S. as their place to live and work from. In 2020, the U.S. had [16.9 million digital nomads](#), a 130 percent increase from 2019's numbers.

Digital nomads who work for European or U.S.-based companies and move to countries in the Global South raise concerns, as they drive

Prepare for the Future of Work

Explore these key questions.

<p style="text-align: center; font-size: 2em; font-weight: bold; margin: 0;">1</p> <p style="margin: 5px 0;">WHY are people quitting their jobs in my department/office/company?</p>	<p style="text-align: center; font-size: 2em; font-weight: bold; margin: 0;">2</p> <p style="margin: 5px 0;">WHAT are new expectations for work and how can they be met?</p> <p style="margin: 5px 0;">Do current job descriptions match what potential employees are looking for?</p>	<p style="text-align: center; font-size: 2em; font-weight: bold; margin: 0;">3</p> <p style="margin: 5px 0;">HOW can I create an attractive workplace within my framework of workplace rules and regulations?</p> <p style="margin: 5px 0;">Can existing rules and regulations be changed and adjusted?</p>
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up prices for real estate and other amenities in the places they move to, resulting in gentrification and displacement.

The public-sector Great Resignation

The Great Resignation began in 2019 (before the pandemic hit) and is still ongoing. The number of Americans quitting their jobs

remains high. The reasons for quitting and impacts in the hospitality, retail, health care, and construction sectors were described in the [2022 Trend Report](#) and APA's [Planning](#) article “[7 Game-Changing Trends and How to Plan for Them](#).”

This year, we focus on the public sector, where job openings are nearing record highs for state, county, and local governments, including planning departments.

It is particularly difficult for the public sector to adjust to changing workplace expectations. Rules and requirements related to remote work and workplace flexibility are in general stricter than in the private sector and salaries are less attractive. Many cities, counties, and states have used funding from the American Rescue Plan Act to retain their staff, but that was a one-time payment that is running out.

According to the Bureau of Labor Statistics, [currently 461,000 fewer people work in the public sector than in 2020](#). To attract more hires, some governments have increased their salaries. Past incentives such as attractive pension programs no longer attract people, especially younger generations, to work in the public sector.

The numbers of open planning positions are at record highs as well, and burnout among planners seems to have become the new normal. Planning departments are struggling to find staff while dealing with myriad challenges in their communities. While salaries and flexibility are important factors, young planners in particular want to be able to make a difference; they want to make the world a better place. Considering that many entry-level job tasks, such as taking meeting notes or counting traffic, can potentially be replaced by artificial intelligence applications, adjusting these entry-level roles and rethinking how to attract new hires (e.g., with a clear mission) could create new



While companies such as Starbucks and Amazon made headlines regarding unionization movements among their employees, many sectors—including retail, service, health care, and transportation—saw an increase in union formations in 2022. Photo by Johnny Silvercloud/Shutterstock.

incentives for people to work in the public sector.

Quiet quitting

Not everyone who is unhappy in their job can afford to resign. The

ones who stayed have created the new trend of “quiet quitting,” or working only as much as needed (or as much as one’s job description suggests) to keep one’s job. [According to Gallup](#), about 50 percent of the U.S. workforce is currently quiet

quitting and not putting any extra effort into doing their jobs. This will have impacts on productivity and the quality of work, as well as workers’ ability to innovate, think outside the box, and creatively problem solve. Some employers

may have to rethink how they treat their employees to regain trust and rebuild motivation.

Waves of unionization

While companies such as Starbucks and Amazon made headlines regarding the unionization movements among their employees, many sectors—including retail, service, health care, and transportation—saw an increase in [union formations](#) in 2022. Unions [won almost 80 percent of their elections](#), the highest rate in over 20 years.

Flexibility and employee experience (EX)

The time of 9-to-5 in-office jobs is over. However, the concept of flexibility at the workplace goes even further. Flexibility means being able to choose how many hours a day you can dedicate to your job and what times of the day you do so, no matter whether it’s a leadership position or an associate position. For many years, some German

companies have been offering employees the option to work part-time or full-time, no matter the position. This flexibility was created to give women, especially mothers with childcare responsibilities, the opportunity to move into leadership positions.

The new mantra is, if you want your employees to be successful in their work, you need to give them what they need to be successful. For some employees, that may mean sleeping in the afternoon and working at midnight because that's when they are most productive. We are moving from customer insights and customer experience to [employee insights and experience](#). What do your employees need so they can be successful in their work?

The four-day work week

A related topic is the discussion around a four-day work week, in which employees work a 32-hour week while keeping the same salary. Over the last two years, the organization 4 Day Week Global (4DWG)

STILL RELEVANT FROM THE 2022 TREND REPORT

Gig work and polyworkers

The Great Resignation

Robotics and automation

Upskilling and reskilling

For more about these trends, visit APA's online [Trend Universe](#).

has partnered with Boston College, University College Dublin, and Cambridge University to conduct the [first four-day work week trial](#), involving over 30 companies and almost 1,000 employees. The results are a clear signal that this could become a trend in the future. Work time reduction has resulted in social, economic, and climate benefits. In most cases productivity went up while employees experienced less stress and burnout. Additional hires in places where productivity would have been negatively affected resulted in decreases

in unemployment. Additionally, greenhouse gas emissions from transportation and energy consumption decreased. Benefits were experienced by both employers and employees. Almost 93 percent of the participating companies have either already made the change permanent or are planning to continue the four-day work week, with about 97 percent of employees also wanting to continue.

Expectations from younger generations

Generation Z has entered the labor market. According to Sophie Wade, a workforce innovation specialist, [Generation Z](#) experiences zero job security, has minimal expectations regarding retirement, and generally distrusts other generations because of the climate emergencies they will be left with. Gen Z workplace expectations differ from those of prior generations, shaped by their top priorities of climate change; equity, diversity, and inclusion in the workplace; and mental health.

INSIGHT FROM OUR TREND SCOUTS

“A lot of the governmental entities are more rigid about in-person work than private folks. I really see the trend that we are going to see more planners who [want to] start their own business. They are saying ‘we are not going to enter into this government world. We don’t want to work from 9 to 5 and be tethered to a desk to do our work.’”

—Amber Dickerson, AICP, Urban Planning Innovations, LLC

Gen Z is tech-savvy and wants opportunities to use that knowledge at work. Young professionals don't want to enter the labor market

saddled with the entry-level tasks of prior generations. They know that many of these tasks can be automated and will eventually be done by a machine.

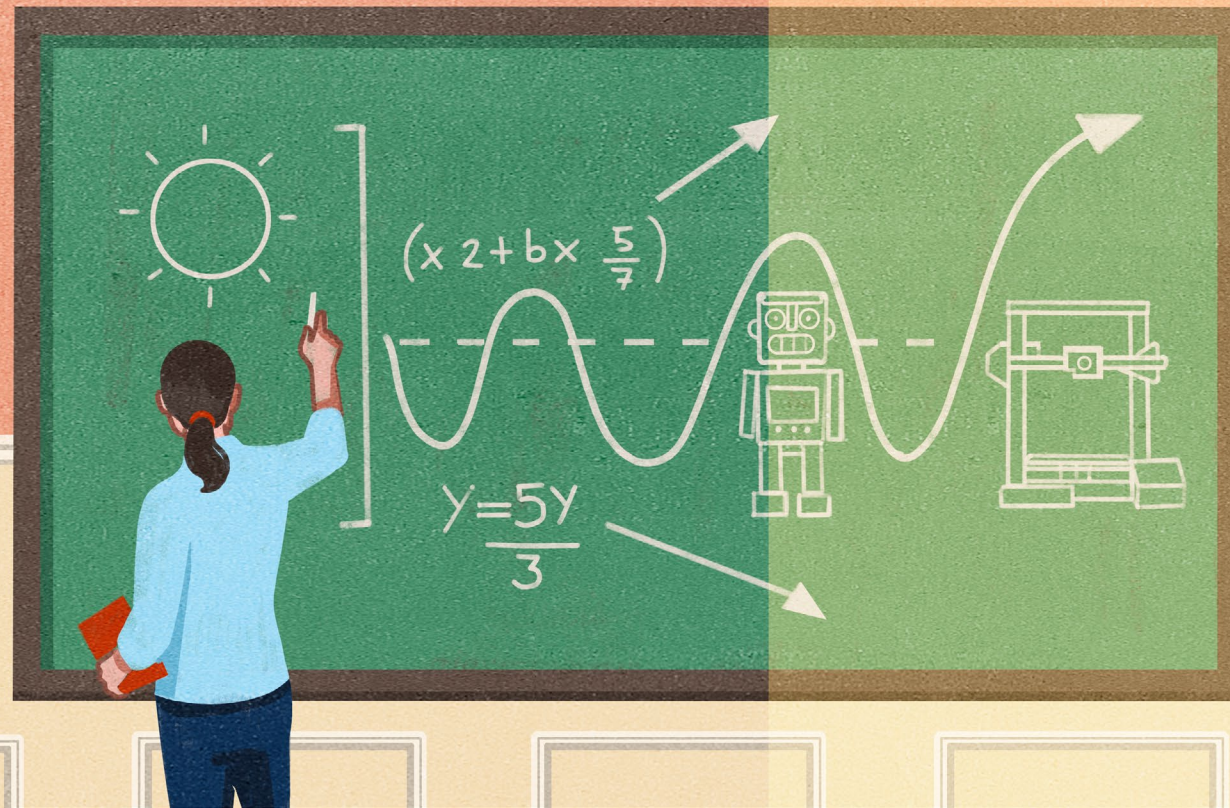
Furthermore, the interest in linear career paths up a career ladder seems to be fading. Many young employees prefer “portfolio” careers, allowing for multiple parallel gigs (e.g., being a research manager while walking dogs and teaching yoga on the side).

Upskilling

Employers have traditionally based hiring decisions on university and other degrees, but the labor market seems to be shifting toward [skill-based hiring](#). It is becoming more important for employees to be able to provide certain skills and related talents instead of a degree. This is a positive development, especially in the light of equity and inclusion. Not everyone can afford a university degree in the U.S., but continuous [upskilling](#) and [reskilling](#) can be supported by employers.

The signals we need to learn about and watch

Looking at the myriad emerging trends planners need to act on and prepare for, it seems that the future is already here. However, there are many signals on the horizon we may want to keep on our watchlist for now, not knowing what directions they may take in the future. Many **tech innovations** promise to be major game changers, including self-repairing **infrastructure** systems or the experiment of growing vegetables in **outer space**. We are also experiencing shifts in political and other **power dynamics** and we can't quite tell yet where they will take us. Last, but not least, we see some interesting **policy and market developments** that let us hope for a greener and more sustainable future.



Geopolitical Dynamics



Flooding exacerbated by climate change—an emergency created by the Global North that is disproportionately impacting the Global South, reflecting the deep interconnectedness of a globalized world—devastated Pakistan in 2022, raising urgent questions of climate reparations and equity. Photo by Graphic_Plus/Shutterstock.

Geopolitics around global warming and climate change (an emergency created by the Global North and disproportionately impacting the Global South), the COVID-19 pandemic and its impacts on global supply chains, and the war in Ukraine and its effects on gas markets and food supply all reflect the deep interconnectedness of a globalized world. At the same time these challenges show how the global demand for energy has been shaping geopolitics and will most likely continue to do so.

Climate reparations and equity

Climate equity, in global terms, refers to equity in climate protection efforts, just distribution of the benefits of climate protection, and alleviation of the unequal burdens created by climate change. The data shows that while wealthy nations have largely contributed to global warming, the countries that have contributed the least to global greenhouse gas emissions have disproportionately felt the effect.

For instance, scientists say that the [devastating flooding](#) that happened in Pakistan (which contributes less than one percent of the world's emissions) in the summer of 2022 was worsened by global warming.

Another challenge in the global climate change debate is reaching a consensus on equitable international commitments. China and Russia are aiming to reach net-zero emissions by 2060, while India's target is 2070. Developed countries often accuse developing countries like India

and China of not doing enough to address climate change. The developing world recognizes the urgency but asks for more leeway and time to prioritize economic growth over climate goals (as the developed world did in the previous century).

Recently, there has been a positive development in this matter. During the [UN Climate Change Conference COP27](#) in November 2022, representatives from 200 countries reached an agreement to provide “loss and damage” funding for the most vulnerable countries who are hit hardest by climate-related disasters. It remains to be seen whether and how the implementation of these funds will create the needed change and support.

Energy demand and the future of geopolitics

The world is committed to climate action, it seems, but there is one problem: the unstoppable demand for energy. Trends such as net zero, decarbonization, and electrification are emerging globally, and

different levels of governments are trying to transition to clean energy and greener economies (see also [Climate Policies, Funding, and Action](#)), promising a variety of target years for net zero and other goals. However, these shifts to cleaner energy sources will also lead to shifts in geopolitics away from fossil fuels towards other materials needed for batteries and other elements required for electrification. This poses the question: are we just substituting one evil for another?

In an [interview](#) with the Copenhagen Institute for Futures Studies, Helen Thompson, Professor of Political Economy at Cambridge University, explained that the geopolitics of electrification will look very different than today’s geopolitics of fossil fuels. Energy generation might become less confrontational, as electricity needs to be produced locally and can’t yet be transported over far distances like oil and gas. Instead, the rather centralized supply of metals and rare-earth materials will gain more attention in



Migrants wait in line to cross the border at El Paso, Texas. Immigration continues to be a contentious political topic in the U.S., with no clear solutions in sight. Photo by Paul Ratje/*The New York Times*.

geopolitics. China, Vietnam, Brazil, and Russia together control over 85 percent of the world’s reserves of [rare-earth minerals](#).

Migration and local impacts

In the [2022 Trend Report](#), we discussed the trend of climate migration and related needs for potential [U.S. receiver cities](#) to prepare for equitable integration. Migration partly or fully caused by climate change is rising and will

increasingly impact local, national, and global politics. By 2050, 1.2 billion people could be [displaced globally](#) due to natural disasters and climate change and 3.5 billion people could suffer from food insecurity.

Impacts on U.S. communities from migration were especially visible in 2022 when the governors of Texas and Florida began [busing migrants](#) to cities such as Philadelphia, New York, and Washington, D.C. What began as a political statement on federal immigration policy

may evolve into a political shift in migrant integration, with implications for this population’s safety and security.

The war in Ukraine has deepened the existing refugee crisis in Europe, contributing further to the global migration problem. Due to the war, nearly [eight million people](#) have fled the country, and the number is rising by the day. Many European countries have given them shelter and necessary support, but after months of migration and no end to the war in sight, organizations, volunteers, and local governments are struggling to address basic needs of the refugees, such as accommodation.

Fluctuating gas prices

The world still depends on fossil fuels, and fluctuating gas prices have direct and indirect impacts on consumers, causing immediate pain at the pump and affecting the cost of everything from food to diapers. In 2022, even adjusting for inflation, [gas prices in the U.S.](#) were at levels

rarely seen in the last 50 years. Fuel prices are driven by the price of crude oil, which is often dependent on global events. Russia is currently under sanctions, which has reduced the supply of Russian oil, and the [October 2022 decision](#) by the Organization of the Petroleum Exporting Countries Plus (OPEC+) countries to limit the production of oil may further increase fuel prices. The price of fuel has an impact on people's travel behavior and could make long commutes more costly for workers, which planners should pay close attention to. The high gas prices of the past year energized the anti-car movement, which advocates for creating more bike lanes and pedestrian-friendly streets.

Supply chain challenges

Global supply chains have been under stress, impacting the global economy and people's lives. Both obvious factors, such as [the war in Ukraine](#) and the [COVID-19 pandemic](#), and other less-publicized factors, including [extreme](#)



The Russia-Ukraine war is having an enormous impact on the global food supply. Some countries import most of their wheat from Ukraine and Russia, and the lack of supply is creating catastrophic food shortages around the world. Photo by Denisfilm/iStock/Getty Images Plus.

[weather](#) and [geopolitics](#), are at play. Due to the uncertainties of war and the pandemic, as well as ever-present challenges with climate change, countries may have to rely on [local solutions and local-ized supply chains](#). The rise of 3D printing manufacturing capabilities and federal policies can support

“[friend-shoring](#),” where sourcing and manufacturing are moved from less-friendly shores to friendly shores, often inside the country. To combat the impacts of intensified weather-related events on supply chains, communities must develop adaptation strategies, such as moving critical logistics centers away

from weather-prone locations and diversifying distribution channels.

Food supply shortages

The Russia-Ukraine war is having an enormous impact on the [global food supply](#), creating catastrophic food shortages around

the world. Russia and Ukraine are major exporters of wheat, barley, and sunflower oil. Some countries import the majority of their wheat from Ukraine and Russia, and the lack of supply to these countries has led to food security issues. In other countries, including the U.S., food supply shortage is one of the reasons for higher prices at the checkout line. [U.S. grocery costs](#) increased by 12.4 percent from October 2021 to October 2022, and prices are expected to keep rising in 2023. Climate change is also threatening food supplies. Extreme weather events such as droughts, heat, and flooding are impacting the production and supply of food items from coffee to seafood.

Strengthening [local food production systems](#) will help combat volatile food prices and support healthy food access. Prioritizing and encouraging local farms, community gardens, and urban agriculture in policies and plans can support local food production and help reduce reliance on food items from far away.

Green Signals



Countries around the world are beginning to enact bans on single-use plastics that are typically used once and immediately discarded, including plastic and polystyrene food and beverage containers, bottles, straws, cups, cutlery, and disposable plastic bags. Photo by Gary Hider/Alamy.

As in the [2022 Trend Report](#), APA's Foresight team has identified several additional green trends from other countries and industries that could be important signals to planners here.

Single-use plastics bans

The [2022 Trend Report](#) touched on the topic of the circular economy. This year, we focus on plastics and recent single-use plastic bans. Single-use plastics refer to products that are usually used once and disposed of right after use, including plastic and polystyrene food and beverage containers, bottles, straws, cups, cutlery, and disposable plastic bags.

Plastics production has exploded over the last several decades. In 2021 the world produced nearly 400 million metric tons of plastic. Plastics can save lives (e.g., in medical products), make transportation less expensive

(plastic packaging weighs less than cardboard, for example), and has advanced the practicality of many technologies. But plastics are also an environmental and public health disaster. Plastic is everywhere—and [plastic waste](#) is too. In 2018, we produced 275 million tons of plastic waste. About eight million metric tons of plastic end up in the ocean every year, and over 80 percent of marine litter is plastics. And microplastics have been found inside the human body. The largest plastic waste generators are the packaging and textile industries.

But governments are beginning to take action. The EU enacted [a single-use plastics ban](#) in 2021

(including single-use plastic plates, cutlery, straws, balloon sticks and cotton swabs; food and beverage containers made of expanded polystyrene; and all products made of oxo-degradable plastic), prohibiting these products in EU member-states' markets. Canada released its [Single-Use Plastics Prohibition Regulations](#) in 2022, prohibiting the manufacturing, import, sale, and export of certain single-use plastics, including bags, cutlery,

food service ware made from or containing problematic plastics, ring carriers, stir sticks, and straws. The U.S. Interior Department announced in 2022 that it will phase out the sale of single-use plastic products in [national parks and other public lands](#) by 2032. California passed a law that will start [phasing out single-use plastics](#) in the state, requiring all packaging to be recyclable or compostable plastic by 2032. Meanwhile, multiple cities and counties in the U.S. have already banned single-use plastic bags and polystyrene foam.

While these laws and regulations are signals for change, we can't tell yet what their impact on environmental pollution and public health will be. When China stopped taking plastics for recycling from the U.S. (and other countries) in 2018, it might have been a wake-up call. The U.S. is one of the world's largest producers of plastic waste but [in 2021 recycled only about five percent](#) of its plastic waste. In addition to using less plastic to begin with, we need to



The market for synthetic food continues to mature and diversify. The Israeli startup Plantish plans for a commercial launch of its 3D-printed, plant-based salmon in the U.S. by 2024. Photo by Asaf Karela.

come up with solutions on how we can reuse and recycle it.

Lab-grown meat and 3D-printed fish

Technology change is driving major developments in the emerging sector of synthetic biology. Today,

one of the major applications for synthetic biology is in [synthetic and lab-grown foods](#). Companies such as Beyond and Impossible have had success in breaking into the mainstream food market by developing synthetic meat. However, over the last year, expectations have cooled somewhat in this sector, as both

companies failed to meet their initial growth targets and expectations. As the market for synthetic food matures and diversifies, however, new approaches to sustainable (and vegan) food alternatives to meat and fish are being developed. In 2021, [Revo Foods](#), an Austrian start-up, launched the world's [first 3D-printed plant-based smoked salmon](#) product. It mimics the texture and taste of real salmon and claims to be just as nutritious without the heavy metals and toxins often found in real fish. The product is currently sold in Europe and the UK. In 2022, the Israeli company [Plantish](#) followed this trend, planning for a commercial launch of their [3D-printed salmon product](#) in the U.S. in 2024. Innovations like these combined with trends such as growing markets for sustainable lifestyles (see [APA's Trend Universe](#)) have the potential to significantly disrupt traditional food industries, particularly the cattle and agriculture sectors, and related land-use patterns.

STILL RELEVANT FROM THE 2022 TREND REPORT

1.5-degree lifestyles and ethical consumption

1-minute city

15-minute city

Car-free cities

Circular economy

Short-distance flight bans

For more about these trends, visit APA's online [Trend Universe](#).

The Futures of Rural Places and Urban Spaces

What happens when agriculture and working trends mash up.

Photoillustrations by Big AI Gruswitz/aaarep.net



American Gothic, Grant Wood, Art Institute of Chicago.

Conventional agriculture continues to feed the world. Synthetic meat and outer-space agriculture are niche markets.

**SCENARIO D
BEEN THERE, DONE THAT**

Pre-COVID-19 practices continue
Most employees are back to in-office work
Cities continue being the places of the creative class
The continuation of conventional agriculture remains a climate concern

**SCENARIO A
THE END OF METROPOLIS—
A CLIMATE NIGHTMARE**

Remote workers moved to the countryside
Agricultural vs. residential land-use priorities cause conflict in previously rural areas
Rural sprawl results in increased automobile dependence and GHG emissions
Cities have become hotspots for crime
Conventional agriculture is a catalyst for increase in GHG emissions



Companies return to in-office work.

Remote work is the new normal.



**SCENARIO C
TO THE CITY AND BEYOND**

Most employees are back to in-office work
The megatrend of growing urban areas has been accelerated as food production moves into cities
Due to climate change, meat is made in laboratories and crops are harvested in outer space
Farmers moved into cities to work in labs and advise space agencies

**SCENARIO B
TAKE MANHATTAN,
JUST GIVE ME THAT COUNTRYSIDE**

Remote workers moved into the countryside
Rural sprawl results in increased automobile dependence and GHG emissions
Due to climate change, meat is made in laboratories and crops are harvested in outer space
Farmers moved into cities to work in labs and advise space agencies

Climate change makes conventional agriculture impossible. The world depends on synthetic meat and outer-space agriculture.



Scenarios 2050

Outer Space



The growth of the private space industry continued apace in the past year, as existing players such as SpaceX expanded on their operations while new players joined the space race. Photo courtesy SpaceX.

The growth of the private space industry was a major trend explored in the [2022 Trend Report](#). This trend has continued in the past year, as existing players expanded their operations while new players joined the space race. SpaceX, Blue Origin, and Virgin Galactic all continued their space-tourism flights in 2022, while smaller companies such as Rocket Lab and Astra sought to build out capacity

and reduce costs for customers seeking to launch smaller payloads, satellites, and experiments.

While planning connections may seem remote at first glance, the growth of the private space industry may have significant impacts for communities here on Earth, and potentially, future communities in space. SpaceX has transformed the small community of [Boca Chica, Texas](#), in just a few short years as it develops its “Starship” program. In the future, planners may need to play a role in the form and function of potential communities in space, especially if

tourism, entertainment, and habitation become major space-based industries.

Space-based governance

The space race in the private sector is allowing for the industry to mature beyond just a few key players. This is contributing to the emergence of new issues related to managing an increasingly crowded low-Earth orbit and regulating Earth-based launch operations. As competition has increased for the emerging “[space economy](#),” calls are increasing

for governments and private industries to further develop and formalize the rules of [space-based governance](#).

The potential for conflict between public and private entities will continue to grow as the number of launches increases annually. In the future, conflict might include major disputes over necessary Earth-based resources or access to launch sites. While space today is a commons not owned by any single entity, the growth of powerful industry players may lead to ownership claims on specific sites and locations in low-Earth orbit or claims on space-based resources. By establishing global rules and standards governing operations in space and on the ground, potential disputes could be more easily resolved, and access to space could be preserved for common and collective use by humanity.

Evolution of the space economy

As the private space industry begins to develop and mature, many launch providers and companies are looking beyond the delivery of satellites and experiments to low-Earth orbit. Diversification into emerging industries is leading to the evolution of a more formalized space economy. The Organization for Economic Co-operation and Development [defines the space economy](#) as “the full range of activities and the use of resources that create and provide value and benefits to human beings in the course of exploring, understanding, managing and utilizing

space.” With the global space industry currently valued at [close to \\$500 billion](#), some analysts believe that the diversification of uses and applications in space could grow the industry to more than \$1 trillion by 2040.

Outer-space tourism, sports, and entertainment

The space-based tourism industry is rapidly picking up steam. SpaceX continued its space tourism flights into low-Earth orbit, and in April 2022 launched four tourists to the International Space Station. Virgin Galactic and Blue Origin also continued their own suborbital tourism operations. While proposals for space-based hotels are decades old, [new plans by companies such as Orbital Assembly](#) are becoming increasingly realistic amid declining launch costs, the growth of private launch providers, and the emerging reality of space-based tourism.

Space-based sports and entertainment are also beginning to see interest from a variety of private



The space-based tourism industry is rapidly picking up steam, with new plans for space-based hotels becoming increasingly realistic amid declining launch costs and the growth of private launch providers. Rendering courtesy of Orbital Assembly Corporation.

organizations. The recently established [Space Games Federation](#) is designing sports and games intended for low gravity and micro-gravity, while NASA, SpaceX, and the actor Tom Cruise have begun discussions [to film a movie from the International Space Station](#), where Cruise also hopes to be the first civilian to conduct a spacewalk.

Space-based solar power

Energy production in the form of [space-based solar power](#) is an emerging area that is beginning to attract attention from NASA, the European Space Agency, and the British government. In the quest for identifying zero-carbon alternatives to fossil fuels, space-based solar power, unimpeded by day/night cycles or efficiency loss due to the

atmosphere, is increasingly being investigated. However, given the costs and further research required, its benefits may be many decades in the future.

Space-based agriculture

[Space-based agriculture](#) is another potential industry experiencing renewed interest and serious discussion. Agriculture in space has been a focus for NASA and other space agencies for decades, as long space voyages (to Mars and elsewhere) would likely require some amount of spaceship-grown food. Tests of how certain crops respond to low-gravity conditions is a mainstay of experiments on the International Space Station. And in 2023, the Redwire Corporation hopes to [launch the first privately developed space greenhouse](#) to help expand crop research studies and improve access to experimental space-based agriculture to a wider variety of potential customers.

STILL RELEVANT FROM THE 2022 TREND REPORT

The growth of private space industries

Space colonization

For more about these trends, visit APA's online [Trend Universe](#).

Political Shifts in Public Safety and Security



Recent trends of those in power questioning election results and challenging the democratic process—in addition to political polarization—hinder the ability of planners to build trust, create unified visions for the future, and engage the community. Photo by LPETTET/E+/Getty Images.

The U.S. is experiencing political shifts in public safety and security that stem from low public trust and intense political polarization. Rollbacks of heavily politicized social protections (such as abortion access and gun control) at the federal level may impact the safety of communities and especially marginalized groups, such as women and children. Private surveillance tools, an extension of the

growing private security industry, indicate a society in which people are suspicious of their neighbors and skeptical of the ability of the government to protect them. The policies and programs that planners recommend, the systems they work within, and the design of the environment and public spaces all contribute to public safety and security.

Federal protections and threats to public safety

Major decisions by the U.S. Supreme Court in 2022 created a source

of uncertainty and exacerbated ongoing political polarization. In June, the Court ruled in favor of expanding the Second Amendment protection of [the right to carry firearms](#), making it more difficult for lawmakers across the nation to regulate guns, especially in public spaces. This is happening during some of the worst years on record for gun violence, mass shootings, and increasing murder rates (see [Policy Impacts on Health](#)). That same month, President Biden signed into law the [first major gun safety legislation](#) passed by Congress in

almost 30 years—indicating that background checks and restricting ownership could be strengthened. Planners should watch for how these two federal actions, in tension, may affect the safety of community members.

The Court’s [decision to overturn *Roe v. Wade*](#) has a far-reaching impact on the health of those who can become pregnant (see [Policy Impacts on Health](#)). Planners should watch for the impacts of this ruling on abortion clinics as a health-care land use, as well as the

STILL RELEVANT FROM THE 2022 TREND REPORT

- Digital vulnerability
- Policy pendulum shifts
- Political polarization
- Public trust
- State-level intervention in local affairs

Learn more about these trends at APA’s online [Trend Universe](#).

equity implications of increased obstacles to abortion access for lower-income people or people with less mobility.

Another key decision is the restriction of the EPA’s authority to [mandate carbon emissions](#). While the effects of this are more directly related to public health than public safety, such as the effects of air and water pollution and the impacts of greenhouse gas emissions on climate change, it is another sign of how Supreme Court decisions can change the country’s legislative and policy framework with decades of consequences.

Status of democracy

Local government planners operate in ostensibly democratic systems, but recent trends of those in power questioning election results and challenging the democratic process are making planning work more difficult. These trends—in addition to political polarization—hinder the ability of planners to build trust, create unified visions for the future,

and engage the community. A weakening democracy also puts marginalized populations at risk of having their rights taken away.

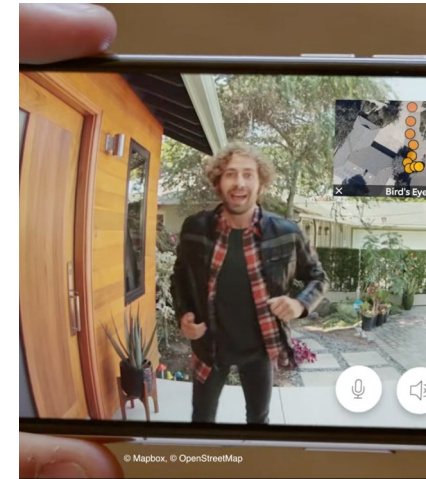
The [2022 Trend Report](#) highlighted a lack of trust in government at the federal level, and recent events show increasing threats to trust in government at the local level. Planners are not responsible for preserving a functioning democracy, but their work is impacted by these worsening threats to democracy.

Private surveillance tools

Private surveillance tools, such as video doorbells or cameras, are becoming commonplace in residential and commercial areas.

Proximity recognition and avoiding recognition systems are some of the emerging technologies that have developed to further this trend and to disrupt this trend, respectively.

[Proximity recognition](#) describes Bluetooth beacons and wireless access points that can track people as they move around. They have found uses in schools and offices,



Private surveillance tools such as video doorbells or cameras are becoming commonplace among residential and commercial areas. In 2022, Amazon came under fire for releasing videos from its home security company Ring to more than 400 law enforcement agencies in the U.S. Photo via Ring.

where they can monitor student and worker behavior. [Surveillance Scoring-as-a-Service](#) has also been gaining traction. In 2022, more than 400 law enforcement agencies in the U.S. used data from Amazon-owned home security company Ring. [Amazon came under fire for releasing Ring videos](#) to police without permission, showing that the

ownership of private surveillance tools has public consequences. In cities such as New York, [“proptech” companies are marketing surveillance tools to landlords](#), promising easier evictions and evasion of rent controls. This could have significant implications for housing access and affordability, especially for lower-income and marginalized populations.

On the other hand, [avoiding recognition systems](#) is a counter to proximity and facial recognition. To protect people’s privacy and the wrongful recognition of groups that are easily misidentified due to algorithmic bias, biometric camouflage to disable recognition is an emerging way to avoid recognition systems. Efforts to ban facial recognition (such as in [King County, Washington](#), and [San Francisco](#)) are a potential policy alternative, or complement, to this technology.

Planners need to be aware of the potential implications of surveillance tools and related data, ensure data privacy, and inform their communities accordingly (see also [Decreasing Digital Trust](#)).

Potential Game-Changing Tech



In December 2022, scientists and researchers at the National Ignition Facility at the Lawrence Livermore National Laboratory in California were successful in achieving “ignition” and creating a net energy output of roughly 50 percent in a fusion reaction. Photo courtesy of Lawrence Livermore National Laboratory.

APA entered new territory last year when we started researching and writing about topics such as the metaverse, blockchain and cryptocurrency, 3D printing, and other technologies that seemed to have nothing to do with planning. But most of them have moved from the Learn and Watch timeframe to Prepare or even Act Now. Their connections to planning have become very clear and their impacts will most likely disrupt the work we do.

This year we again introduce some new tech signals for which it is not yet clear what their impacts will be or whether they will end up in next year’s trend report. They seem important enough to be shared as potentially relevant to planners.

Fusion power

Fusion power has long been a mainstay of science fiction and enthusiastic proposals and experiments, but it has failed to materialize as a practical and scalable

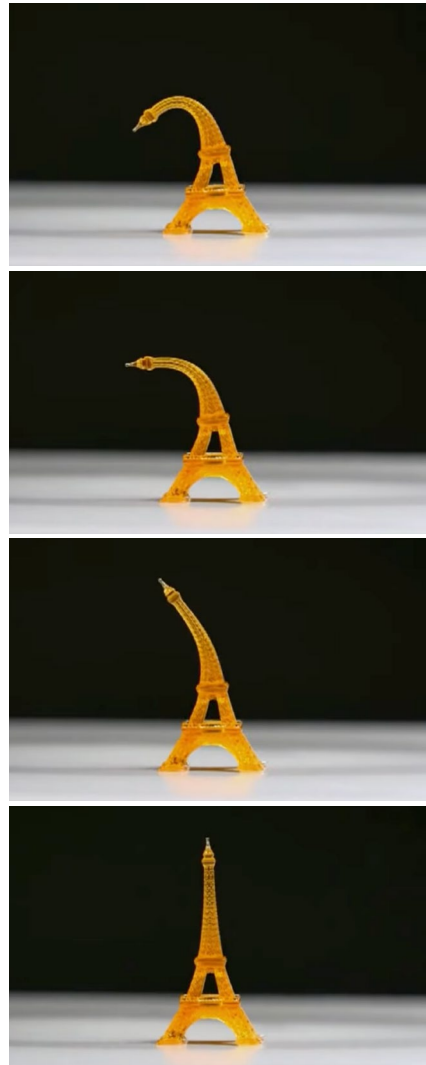
energy source. The fusion of two atomic nuclei into a heavier single nucleus releases energy, essentially replicating the power of the sun and other stars. In theory, this reaction could result in “free” limitless energy with very little nuclear waste and abundant fuel supplies—a truly revolutionary development on a global scale. Until recently, no design or experiment has ever produced more power than it has consumed. However, on December 13, 2022, the Department of Energy announced

a [major breakthrough](#). Scientists and researchers at the National Ignition Facility were successful in achieving “ignition” and creating a net energy output of roughly 50 percent in a fusion reaction. While the current energy output of these recent fusion developments is comparatively small, and the infrastructure required to generate this output is large, reaching ignition and creating energy through a fusion reaction is a major landmark in the history of sustainable energy production. The potential impacts of fusion power are extremely difficult to quantify. Should fusion power prove to be scalable and

STILL RELEVANT FROM THE 2022 TREND REPORT

3D-printed homes
3D-printed infrastructure
3D-printed anything

For more about these trends, visit APA's online [Trend Universe](#).



Researchers used 4D printing to create this miniature Eiffel Tower, which recovers its upright shape when heated to 60°C. Photo via Multimaterial 4D Printing with Tailorable Shape Memory Polymers.

practical, it could likely outcompete many (or all) of the existing sources of energy in use today.

4D printing

The [2022 Trend Report](#) highlighted the trend of 3D printing and the many sectors it will potentially affect (see also the [Trend Universe](#)). The industry keeps evolving, with the latest innovation being [4D printing](#), which adds a fourth dimension: time. 4D printing uses [smart materials inspired by nature](#) that can change their shape over time. As flowers open during sunlight or close during rain, smart materials respond to external stimuli like heat, light, pressure, and others. This combination of 3D printing technology and material sciences introduces movement to the printed products without the use of mechanics. Depending on the materials, they may bend, twist, shrink, or expand.

While this technology is still in its very early development stages, its application would be a game

changer in multiple industries: medical, manufacturing, construction, automotive, consumer goods (e.g., furniture—imagine that IKEA chair building itself), and also infrastructure. For example, self-repairing infrastructure systems could be one application relevant to planning, as could flexible stormwater pipes that expand during extreme rain events and contract as needed. This is certainly a technology we want to learn more about and keep watching while it evolves.

Quantum computing

[Quantum computing](#) is an emerging method of computing intended to solve extremely complex problems beyond the processing expertise of “classical computers.” Quantum computing capitalizes on the vagaries and complexity of the interactions of particles at the subatomic scale to make calculations, rather than relying on microprocessors and traditional integrated circuits. Research into this approach to computing has been underway for

decades, and companies such as IBM have played a major role in developing quantum computers that are approaching practicality and usefulness for human needs.

Potential applications for quantum computers include cryptography and codebreaking (useful for system and network security), more efficient searching and problem solving, systems simulation, and machine learning, AI, and algorithm development. The use of quantum computers in the realm of systems and simulations could be extremely useful in the context of smart cities, planning systems, and human behavior within these systems. The utility of quantum computing in AI, another area with major potential applications in planning practice and for the dynamics of complex systems, also may hold significant potential. Still, practical quantum computing is in its infancy, with many applications currently unknown without further development, research, and use.

The future of planning



**Planning
Competencies
and Skills**



**PlanTech:
Updating the
Planner's Toolkit**



Conclusion

Planning Competencies and Skills

The world is in constant flux and so is the planning profession. In the [2022 Trend Report](#), we emphasized a need for greater agility in planning due to increased uncertainty about the future, a need for more interdisciplinary collaborations to tackle an ever more complex world, and the need for upskilling, specifically human skills that can enable us to respond to societal challenges. These themes continue to dominate this year's trend report and planners need to adopt new skills and approaches to be able to tackle them. Together with our trend scouts, we identified additional qualities future planners will need to bring to the table and the skills they will need to acquire. The main themes are people-centric and hyperlocal planning approaches to enhance equity, integration of futures literacy and imagination into planning to become proactive instead of reactive, and merging the digital and the real worlds to generate more inclusivity.

To meet the needs of a changing world, in 2022, APA launched its [Upskill Planners](#) initiative, an ongoing effort to provide education and trainings on skills planners will need to tackle current and future challenges. The first training released under this initiative, [Using the Future to Create Dynamic Plans](#), focuses on futures literacy and how planners can use the future in their work. More trainings that will contribute to a robust and resilient planning profession will be released throughout the coming months and years.

People-first planning and hyperlocal approaches



Learning from the past, we acknowledge that the focus of our plans should be the people who live in our communities instead of specific domains that were once defined as the traditional comprehensive plan elements. People-first planning focuses on human beings and the systems that serve them, including school systems, policing systems, food systems, and others. New comprehensive plan elements might be needed. Informal, community-based knowledge (or tacit knowledge) can help to define new focus themes, especially in underrepresented communities. Everything is interrelated, and systems thinking can help to understand the different connections between needs and community assets.

INSIGHT FROM OUR TREND SCOUTS

“I think we need to have more visions that we can promote about positive futures and just keep pushing people towards the positive vision. We don't really have a lot of those now. Maybe trend scouting can lead to these visions, but we need to package it in a narrative that's easy to convey to the public.”

—Dowell Myers, MCP, PhD, University of Southern California

To be able to include community-based knowledge in planning equitably and effectively, hyperlocal solutions are needed. [Hyperlocal zoning concepts](#) created new opportunities for housing in Sacramento; Portland, Oregon; and Minneapolis. The Swedish concept of the [1-minute city](#) provides a hyperlocal perspective on street design and related co-creation.

Planners will need to upskill and learn about people-first planning approaches that use community-based knowledge (see for example APA's [PAS Quicknotes 97](#), “[Asset-Based Community Development](#)”) to make planning more inclusive and people-centric.

Institutionalizing imagination



The growing number of trends and signals in our [Trend Universe](#) reflects the continuous and accelerating change we are living in. Constant disruption seems to be the new normal. It doesn't have to be that way, though.

Disruption usually occurs due to a lack of preparedness, reactive actions instead of proactive actions, and the absence of imagination as an integral part of planning. Futures literacy and the ability to imagine multiple plausible futures, interdisciplinary collaborations, the inclusion of diverse perspectives, and the ability and openness to question dominant narratives and existing systems can help link the present and the future together more tightly and mitigate the impacts of disruptive events on our communities.

THE CASE OF TRANSPORTATION PLANNING. As noted earlier in this report, transportation planning is likely today's most disrupted planning sector. Looking at the list of transportation-related trends (see [Equitable, Environmentally Responsible Transportation](#)) and the number of existing and emerging transportation systems, it becomes very clear that transportation planning needs new ideas and approaches to make sense of and keep up with the pace of innovation in this sector.

The concepts of streets and transportation management need to be rethought. The combination of driving lanes, bike lanes, and sidewalks no longer serves today's transportation systems. We live in a world in which pedestrians and people in wheelchairs need to share their dedicated space with scooters, delivery robots, and other ground-based pick-up-and-drop-off

INSIGHT FROM OUR TREND SCOUTS

“I think MaaS [Mobility-as-a-Service], of all the different innovations we are seeing in transportation, has the largest potential to create positive impacts on society. It is taking off much more in Europe, but not as much in the U.S. Hopefully we will continue to see U.S. transit agencies being more interested in this.”

—Nico Larco, AIA, University of Oregon

services. Riding a bike can be life-threatening unless a separated bike lane is available, which it in most cases isn't. And it's unclear if adding more concrete to our streets will make them safer. Even the sky is no longer the limit, as we may soon be able to hail flying taxis or have our groceries delivered by drones. Mobility-as-a-Service providers try to integrate all these systems on one service platform (focusing on the actual purpose of transportation, which is to get people from point A to point B, instead of the specific system). And in addition, local governments are moving toward the electrification, decarbonization, and automation of transportation overall.

Planning needs to become more proactive instead of reactive. Taking emerging transportation systems seriously and preparing for them at the right time (not when it's too late) is one crucial part. Equally important is learning from past mistakes, of which there have been many. When cars became a mass-produced product, everything revolved around cars. Today we are tearing down highways because we realize they created more harm than benefits for those communities. An equitable and sustainable transportation system will have to revolve around people and their needs to live successful lives, not around the

means of transportation and what it needs to operate.

The transportation planning field might be an extreme example. However, it showcases how a changing world requires updates to the built environment, the policy arena, and the planning approaches we use. Instead of reacting to changes around us and responding to disruption, as planners, we want to be the change agents who shape the future of our communities, proactively.

Planning in a hybrid world



Compared with other professions, planners in the U.S. have been adapting slowly to the digitalization trend. However, some argue that the evolution of the internet and [Web 3.0 will require a Planning 3.0](#). Digital literacy is one of the most important skills in a world where almost anything can be done online. Ensuring digital inclusion, cybersecurity, and data privacy is more critical than ever before.

In general, we see three areas where the digital transformation of planning will impact the ways planners do their work: information and communications technologies (ICT) are

driving a shift towards dynamic planning, co-creation, and the need to plan for a hybrid world.

DYNAMIC PLANNING. The availability of massive volumes of data (or [big data](#)) in real time allows planning to become more agile. Plans can be updated more frequently, which will allow planners to more swiftly pivot and adjust.

Today, [extended reality](#) and [digital twins](#) are mainly used for visualization of plans. However, these tools (which we mentioned in the [2022 Trend Report](#)) can make planning more dynamic. APA's PAS Report 599, [Smart Cities: Integrating Technology, Community, and Nature](#), explains how. Examples for tools are also described in the [PlanTech](#) section of this report.

ICT-ENABLED CO-CREATION. During the COVID-19 pandemic, many planning offices had to shift to online engagement. Many of us realized that online meetings were more inclusive, offering more flexibility for those with internet or other remote access (e.g., calling or “zooming” in while working, taking care of kids, etc.). Additionally, digital online tools can be used to visualize plans while creating them together with community members. In the [2022 Trend Report](#), we mentioned how hybrid meetings (the combination of in-person and virtual meetings) will allow for a wider reach and larger participation overall, adding more inclusivity.

However, this is not the end of Arnstein's ladder: co-creation is next. ICT enables those with internet connections to become “citizen planners” and more actively engage in planning, allowing them to directly shape their communities. This will make planning more complex and less predictable, but also more

INSIGHT FROM OUR TREND SCOUTS

“There are two things about human development that I think are important. One is the fact that the population is aging, especially in the U.S. Planners need to get ready for that. [...] And, people are more educated and more demanding from their governments. It means that planners need to figure out how we can do participatory processes better.”

—Nader Afzalan, PhD, California Governor's Office of Planning and Research

inclusive. We are seeing a global trend (driven by the development of ICT) toward increasing social self-organization, including in planning.

[Planning 3.0](#) is about citizen planners using ICT for crowdsourcing, employing open data platforms and open-source digital twins to actively participate in shaping their community's future, and planning for the individual needs and identities in the community. As noted in [Social Media Influencers and Impacts on Communities](#), TikTok has become a place for open discourse on planning. As planning is becoming more user-driven and decentralized, planners must make sure that those who don't have internet connections can participate as well. New approaches will be needed to allow for hybrid and inclusive co-creation to ensure no one will be left behind.

PLANNING FOR A HYBRID WORLD. Many industries have started to think about how to incorporate a hybrid world into what they do. This blend of online activities with activities in the real world seems to have become the new normal post-COVID-19. Office workers are still trying to understand what

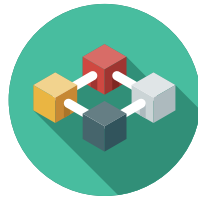
the right mix of in-office work versus remote work will be. Certain activities are best done in person, such as team-building activities, workshops, and some meetings. Other tasks, such as desk research, in-depth focus work, programming, or similar activities, can easily (and in many cases more efficiently) be done alone at home or wherever the employee wants to work.

The same discussions take place in everyone's everyday lives. Digitalization has turned cities and communities upside down and is driving societal, economic, environmental, and political changes, making the world more complex and more dynamic. The ideas of people, space, and place become blurry in a world where we can live, work, and play in hybrid ways. Planners will have to incorporate hybrid lifestyles into the work we do. The future of planning will have to expand from the built environment and its societal complexities to planning concepts that consider both the virtual and the built world: planning for a hybrid world. It may require a new definition of public space and related activities and a rethinking of what mobility means, among many other things we might not even be aware of today.

PlanTech

The pace of technology innovation is unstoppable, as the emerging trends and signals in this report show. This is also the case with PlanTech: technologies planners can use in their work to facilitate processes or make certain tasks more efficient.

Updating the planner's toolkit



The [2022 Trend Report](#) introduced many technologies that are constantly being updated, improved, and expanded. The list of [smart city digital twin](#) applications and [scenario planning tools](#) is getting longer.

[Extended reality](#) is becoming more and more advanced. And the combination of all these technologies is creating the metaverse, which may someday serve as a planning tool as well. In addition, [blockchain](#) applications have entered the planning profession, among many others.

Applications of artificial intelligence, machine learning, and computer vision are becoming more common in planning. Examples can be found in APA's *PAS Memo 111*, "[Artificial Intelligence and Planning Practice](#)," the *Planning* article "[The Art of Learning by Example](#)," and the recently published whitepaper "[AI in Planning: Opportunities and Challenges and How to Prepare](#)."

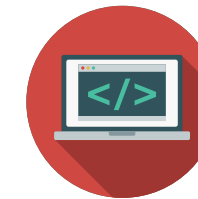
For additional resources on practical PlanTech, the [APA Technology Division](#) has created the [Urban and Regional Planning Resources platform](#). It provides technology resources to aid in the planning process, including information on specific tools, their purposes, and links to where they can be downloaded.

INSIGHT FROM OUR TREND SCOUTS

“It’s getting much easier for noncoders or nonprogrammers to develop software. Not simple software, but interactive and pretty good software that can solve everyday problems.”

—Jing Zhang, AICP,
Morgantown Monongalia MPO (West Virginia)

Open-source, consumer-grade AI



Today, one no longer needs to be a technology expert to participate in the development of technology and tools or even create the software for it. More and more open-source offerings provide opportunities to create one's own tools and customize them to any purpose or need.

Consumer-grade AI refers to a shift from highly technical AI apps to those that don't require extensive coding. Initially, the development of AI apps was restricted to AI professionals and researchers. But due to the availability of low-code and no-code offerings from companies such as Amazon Web Services, Azure, and Google Cloud, nonexperts can now easily develop and

deploy their own AI applications. Consumer-grade AI can influence every aspect of life.

Consumer-grade AI will create opportunities for planners to co-create planning-related apps without being experts in AI. An excellent example is the use of consumer-grade AI for generating realistic or contextual images and text. [DALL-E](#) is a large-scale AI model built by [OpenAI](#) that uses a neural network to generate original images from text descriptions. [Zack Katz](#), a Brooklyn-based artist and musician, uses the DALL-E model to create various urban design and planning scenarios of built environments based on prompts. Consumer-grade AI thus has the potential for generating a zoning map or writing elements of plans from a few prompts.

Open-source AI solutions can be used in urban planning to improve efficiency and equity in several ways. For example, machine-learning algorithms can be used to analyze large amounts of data and identify patterns that can help planners make more informed decisions. This can help planners understand the needs and preferences of different communities and design urban spaces that are more inclusive and equitable.

Additionally, natural language processing (NLP) techniques can be used to analyze public feedback and suggestions, making it easier for planners to incorporate the voices of the community into their decision-making processes. For instance, [GPT-3](#) (Generative Pretrained Transformer 3) is a large-scale language model developed by OpenAI that can generate human-like language. [ChatGPT](#) is a prototype AI chatbot (also developed by OpenAI) that specializes in dialogue. Similarly, Google's [LaMDA](#) (Language Model for Dialogue Applications) manages

INSIGHT FROM OUR TREND SCOUTS

“In the future, the key to unlocking progress and impact is getting different disciplines’ data to work together and be relevant to each other. We are getting to the point where each discipline is developing custom software, standardizing workflows and data, and integrating new technologies into their work. To maximize impact, disciplines should strive to make sure their solutions to problems are accessible and scalable. I think that requires us to be more adaptive or agile to keep pace with what these new abilities enable and find applications for them.”

—David Wasserman, AICP, Alta Planning + Design

open-ended conversations. Google [MUM](#) (Multitask Unified Model) is a tool that can respond to complex search queries.

Overall, using AI and machine learning in urban planning can help to make the planning process more efficient and effective, ultimately leading to better outcomes for all members of the community.

Conclusion

This is the second Trend Report for Planners that APA has published in partnership with the Lincoln Institute of Land Policy. And while the world still seems upside down because of long-lasting impacts from the COVID-19 pandemic, the myriad of emerging trends and shifts around us make it ever harder to understand the present, let alone the future. The enormous number of trends and signals listed in these two reports show how

important it is to equip ourselves with the tools and methodologies needed to make sense of this complexity and continuously accelerating change.

The purpose of this report is to help planners navigate these changes and prepare for what is on the horizon. And while the intent is to neutrally explain trends and signals and describe relevant shifts around us, the report also provides links to potential solutions and guidance on how challenges can be turned into opportunities.

The future can seem overwhelming, but it can also be exciting. Global and local challenges need solutions, while social innovations and technological developments seem limitless. The solutions are out there—now is the time to learn about them, embrace them, and apply them in equitable and sustainable ways.

APA and the Lincoln Institute will continue updating you on future developments and emerging trends and will provide you with the right guidance, knowledge, and successful practices so you can respond to the challenges of today while preparing for an uncertain future.