

Scenario Planning

*Helping Us Better
Understand Residential
Density Choices
Post COVID-19*

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Section 1. The Changing Landscape of America's Great Cities

City officials, policy makers and planners tasked with reimagining the urban environment are working to understand evolving trends and how urban communities must be configured in the future to enable residents to safely cohabitate in dense urban environments, especially given emerging and potentially converging factors, including the effects of the COVID-19 pandemic.

The decision-making process needs to incorporate the extent to which many of our work, recreation, social and lifestyle choices continue to change. The impact to residential density—typically defined by the number of housing units in a given area (such as acreage or square miles) and including non-urban features such as parks and open space—must be considered to account for how and where we live. What will cities look like in the future? How will societal, demographic and economic events impact the way our urban communities serve the changing needs of their residents?

Recent information indicates that major cities such as New York City, Los Angeles and Chicago have been experiencing increasing levels of out-migration that have only been expedited by the pandemic. For various reasons, residents have been leaving densely developed urban centers for alternative locations that provide more space and potentially fewer people per square foot.¹ Because the future still poses some uncertainty and important changes will continue to occur, traditional planning and forecasting methods may not allow for the potential unknowns and variations in the recovery period and beyond. Therefore, applying what is known as a “scenario planning approach” tests multiple future possibilities using a set of variables. This approach enables decision makers in our cities to imagine different possibilities and test various factors and assumptions that could influence urban residential density and design, providing a framework to adapt to future scenarios.

Because we don't fully understand the short- or long-term effects of the pandemic, a scenario planning approach provides certain benefits (i.e., flexibility to develop and test alternate futures) versus traditional planning/forecasting methods. Scenario planning is essentially a process that establishes different pathways when we don't have solid data and trends to determine a direct course of action. Using this approach, we can test the effects on future residential density and design levels to consider the impacts of different factors, such as advances in technology, telecommuting and social distancing. Scenario planning can also be used to test specific assumptions—or a combination of assumptions (such as out-migration and housing cost)—for growth and investment.

Various combinations of factors and assumptions can be evaluated, including, but not limited to the following:

- **Land use and development patterns:** growth or lack of growth, sprawl or consolidation, transit-oriented development, regional population shifts, residential market requirements, etc.
- **Economy:** regional and local economy strength, weaknesses and opportunities, infrastructure investment, housing cost, cost of services, etc.
- **Social characteristics and demographics:** in-/out-migration, residential growth or decline, social distancing, income, etc.
- **Environment, energy and technology:** green investments, natural disasters, carbon/energy constrained future, telecommuting, etc.

Scenario planning complements traditional transportation and development forecasting, as both processes are critical to establishing planning, design and investment decisions. The distinct difference from traditional transportation and development forecasting is that scenario planning provides potential visions rather than accepts trend-line projections so that a preferred course can be anticipated. Together, scenario planning and traditional forecasting processes provide an understanding of the potential impacts of different plausible futures as they relate to residential density, as well as a desired outcome or an expected future.

¹ ABC, Inc., KGO-TV San Francisco, Coronavirus trends: City dwellers looking to move to suburbs amid pandemic, May 3, 2020, <https://abc7news.com/coronavirus-real-estate-housing-market-trend-new-york-city-trends/6147512/>;

Section 2. Planning Factors

DECLINING POPULATION GROWTH

Many major urban areas were already experiencing declining population growth before the COVID-19 pandemic. Of the 384 metro areas within the U.S., 91 (23.7 percent) experienced declining population growth between 2010 and 2019.² In all, population growth in the country's major metropolitan areas fell by nearly half over the course of the past decade.³

Further, the country's three largest metropolitan areas—New York City, Los Angeles and Chicago—experienced a decrease in population in the past several years. As of August 2019, New York City led all U.S. metro areas as the largest net population loser, with 277 people leaving every day, which is more than double the net out-migration of 132 from the prior year. Los Angeles and Chicago were next with triple-digit daily losses of 201 and 161 residents, respectively.⁴

HIGH HOUSING COSTS

The American dream of owning a home has become harder to obtain in the last decade, especially in big cities. Using data from the real estate company Zillow, WSP found that the median U.S. home value in January 2020 was \$250,000, an increase of 55 percent since 2012. During that same period the average home price in California almost doubled from about \$300,000 in 2012 to about \$570,000 in 2019.⁵

The housing cost increases are most acute in the major metro areas. The median home value in the San Francisco Bay Area is over \$1,000,000, \$650,000 in Los Angeles and \$620,000 in San Diego. These high housing prices are indicative of prices in big cities along the West Coast. In Seattle, where the average house costs \$760,000, home



prices have doubled since 2012. Portland's housing prices have increased by almost 80 percent over that same time period.

In metro areas, lower-cost homes are difficult to find. Data collected on 88 metro areas found more homes for sale in the top third of the market by price than in the bottom third. In 46 of these metro areas, more than half of the available supply was at the high end of the market. The largest home price imbalances were in moderately sized, moderately priced, and fast-growing metros such as Boise, Charlotte, Des Moines and Durham, where about 65 percent of existing homes for sale were at the upper end of the market.⁶

WAGE DISPARITY

A growing disparity between wage increases and housing costs is another critical factor in out-migration trends, which affects certain demographics more acutely than others.

While rent has been increasing in cities at a rate of 3 percent annually, wages have been steadily decreasing at a rate of approximately 0.1 percent per year.⁷ Those applying for U.S. Department of Housing and Urban Development subsidies waited an average 27 months in 2017, ranging from about 18 months for public housing to 32 months for vouchers. Many cities have even closed their waiting lists for both programs.⁸

In 2019, Harvard research found that even high-income earners struggled with the cost of rent in coastal cities, and one-third of all households in metro areas are cost burdened.



² U.S. Department of Commerce, Most of the Counties with the Largest Population Gains Since 2010 are in Texas, March 26, 2020, <https://www.census.gov/newsroom/press-releases/2020/pop-estimates-county-metro.html>

³ The Brookings Institution, Even before coronavirus, census shows U.S. cities' growth was stagnating, April 6, 2020, <https://www.brookings.edu/research/even-before-coronavirus-census-shows-u-s-cities-growth-was-stagnating/?referringSource=articleShare>

⁴ Bloomberg, More People Are Leaving NYC Daily Than Any Other U.S. City, August 29, 2019, <https://www.bloomberg.com/news/articles/2019-08-29/new-york-city-metro-area-exodus-soars-to-277-people-every-day>

⁵ Zillow, United States Home Prices and Values, <https://www.zillow.com/home-values/>

⁶ Joint Center for Housing Studies of Harvard University, The State of the Nation's Housing 2018, https://www.jchs.harvard.edu/sites/default/files/Harvard_JCHS_State_of_the_Nations_Housing_2018.pdf

⁷ Invisible People, Lack of Affordable Housing Remains the Leading Cause of Homelessness, March 22, 2019, <https://invisiblepeople.tv/lack-of-affordable-housing-remains-the-leading-cause-of-homelessness/>

⁸ Joint Center for Housing Studies of Harvard University, The State of the Nation's Housing 2018, https://www.jchs.harvard.edu/sites/default/files/Harvard_JCHS_State_of_the_Nations_Housing_2018.pdf

However, the spread of renter cost burdens was most evident in expensive metro areas such as Los Angeles, New York City, San Francisco and Seattle. For instance, in the 25 highest rent markets, about 46 percent of renter households with incomes of \$45,000–\$74,999 were considered cost burdened in 2017, compared with only 30 percent of same-income households across all 100 largest metro areas. In the 25 highest rent markets, 28 percent of renters with incomes of \$30,000–\$44,999 and 7 percent of those with incomes of \$45,000–\$74,999 were considered severely cost burdened, while comparable shares across the 100 largest metro areas were substantially lower at 16 percent and 4 percent, respectively.⁹

Similarly, the ability to buy a home is also being affected by the increasing gap between wage growth and housing costs. In nine California metro areas—including Los Angeles, Oxnard, Salinas, San Diego, San Francisco, San Jose, San Luis Obispo, Santa Cruz and Santa Rosa—a household with the local median income could afford less than a quarter of homes sold in 2017. In 26 other metro areas—including Boston, Denver, New York City, Portland and Seattle—a median-income household could afford the monthly payments on only a quarter to a half of recently sold homes. In these areas, potential buyers would have to choose from a limited set of neighborhoods or from smaller than preferred units.¹⁰

REMOTE WORKING

Perhaps one of the most lasting influences of COVID-19 will be its effect on the workplace. With many companies mandating working from home and/or restricting the number of individuals in a workplace environment as an ongoing safety measure, the COVID-19 pandemic has forced all companies and employees to test this workplace model,



and the effects could lead to permanent changes. Like many companies, Twitter encouraged its employees to work from home starting in early March of 2020. By early May, Twitter became the first tech company to announce that their employees would be allowed to work from home indefinitely.¹¹ According to Kate Lister, president of Global Workplace Analytics, this trend will continue with more than 25 percent of employees expected to continue working from home multiple days a week after the pandemic is over, which could not only affect our need for office space, but also change workers' desire to live close to their jobs.

TECHNOLOGY IMPACTS

Technology has connected people more seamlessly, allowing for the successful transition to remote working, which has been seen during the pandemic. Just as highways gave rise to the suburbs, other technology advances are likely to influence our urban form. Connected autonomous vehicles making their way onto the roads could change today's extreme commutes into productive extended work hours. Larger, more affordable homes farther from central business districts are likely to attract a new wave of buyers.

COVID-19 AND ITS IMPLICATIONS

Suburban real estate brokers are already reporting an uptick in the number of inquiries from people living in New York City for single-family homes in suburban surrounding areas, citing cost, social distancing and the need for space (as well as a shift to telecommuting) as factors.¹² One broker interviewed on Fox News reported prospective buyers suggesting they could pay less for a single-family home with more space and a back yard than their current rents in New York City. Residents of large cities could be seeking a new environment where there is more room to account for the space needed to properly socially distance from one another. COVID-19 could be accelerating the out-migration patterns, because residents are choosing areas that are not near central business districts, particularly considering the ability for working remotely that businesses have experienced through online collaboration technology and connectivity.

⁹ Joint Center for Housing Studies of Harvard University, The State of the Nation's Housing 2019, https://www.jchs.harvard.edu/sites/default/files/Harvard_JCHS_State_of_the_Nations_Housing_2019.pdf

¹⁰ Fitch Ratings' special report, Cordon Pricing Holds Promise for U.S. Cities: Lessons Learned from Congestion Zones Abroad and What Is Next, December 3, 2019, <https://www.fitchratings.com/research/infrastructure-project-finance/cordon-pricing-holds-promise-for-congested-us-cities-lessons-learned-from-congestionzones-abroad-what-is-next-03-12-2019>

¹¹ BuzzFeed, Twitter Will Allow Employees To Work At Home Forever, May 12, 2020, <https://www.buzzfeednews.com/article/alexkantrowitz/twitter-will-allow-employees-to-work-at-home-forever>

¹² The Real Deal, Real estate activity in suburbs catches second wind in Covid era, April 28, 2020, <https://therealdeal.com/2020/04/28/real-estate-activity-in-suburbs-catches-second-wind-in-covid-era/>; ABC, Inc., KGO-TV San Francisco, Coronavirus trends: City dwellers looking to move to suburbs amid pandemic, May 3, 2020, <https://abc7news.com/coronavirus-real-estate-housing-market-trend-new-york-city-trends/6147512/>



Section 3. Applying a Scenario Planning Approach for the Unknown

Scenario planning provides the opportunity to evaluate a range of outcomes, and explore the benefits, challenges and costs of alternative futures, recognizing that different geographies, incomes and other demographic variables could exhibit different trends as they relate to where and how people will want to reside. Scenario planning also provides local agencies and decision makers with the opportunity to test and realize short-, medium- and long-term planning and development realities, within a set of variables that present a range of potential outcomes. Therefore, over time, multiple variables can be tested to develop potential future realities that can then be strategically implemented. For instance, variable income levels and housing costs presented in a matrix can be adjusted to represent potential future conditions to inform metropolitan migration scenarios driven by those factors. Such outcomes can also be tested against the broader regional, state and federal goals and requirements, which enables broader outcomes and comprehensive solutions.

However, existing trends, such as those pre-COVID-19 pandemic, do not represent a coherent vision for the comprehensive growth, residential development and density, and employment and transportation needs of regions, particularly as populations are now making decisions using an entirely new set of life-changing characteristics. Therefore, scenario planning develops a range of short-, medium- and long-term visions that are not necessarily captured in traditional trend-line modeling embodied in most existing plans and forecasting models. For example, the scenario planning matrix may now need to incorporate and test social distancing and levels of increased telecommuting into the long-range planning process to establish new, potential residential urban design density requirements and cost implications.

Scenario planning encourages policy makers, stakeholders and the public to think creatively and comprehensively when considering a wider range of potential opportunities, challenges, and possible development and residential choice-related futures than what is typically considered in most traditional planning applications. However, scenario planning is not about predicting the future or providing a specific answer. Rather, it is a methodology for evaluating alternative futures not easily estimated using past trends or assumptions.

Scenario planning can be applied broadly to test a specific assumption or a combination of assumptions and factors for residential density, growth and investment. To address the question of residential density choice, various combinations of assumptions and variables can be evaluated, including but not limited to those related to the following:

Land Use Development Patterns

- Out-migration from urban cores
- Moderate urban densities versus sprawl
- Transit-oriented development
- Regional shifts expedited by the COVID-19 pandemic
- Meeting residential market requirements
- Provision of open space for recreation and social distancing

Economy and Growth

- Regional economic changes based on migration and development pressure
- People relocating to more transit-oriented locations
- Requirements for additional open space



Infrastructure Investment

- Costs for new roads, transit services and utilities
- Demographics
- In-migration
- Out-migration
- Residential growth and relocation

Other

- Green investments
- Recurring health crises
- Sustainability and energy constrained future
- Cost of provision of municipal services



Many regions and metropolitan areas around the country have engaged in scenario planning for a variety of reasons. The scenario planning approach and model is flexible and adaptable to geographies and economies that have been severely affected and require creative near-term solutions that will lead to long-term stability. Fundamentally, the scenario planning process is used to address issues that are not always dealt with by existing land use and transportation plans and traditional modeling such as those related to the COVID-19 pandemic.

As part of this process, it is important to develop questions (and the potential outcomes) to be addressed, such as the following:

- How well will different planning scenarios compare to existing forecasts?
- What could cities look like with different kinds of development densities and related investments in open space and infrastructure and services?
- How can land use and transportation strategies be used to increase the prosperity and well-being of communities, including the appropriate level of growth and development density?
- How can land use and transportation strategies address out-migration from areas that are densely developed?
- What could happen if the metropolitan area grows in substantially different ways?

The following steps (patterned after the Federal Highway Administration scenario planning format) will address the density choice challenge:

Step 1: Research the Driving Forces

- Define predictable events:
 - Local demographics
 - Trends in development
 - Levels of congestion and auto/transit use

- Define non-predictable events:
 - Post-COVID-19 pandemic economy
 - Future availability of infrastructure funding
 - Technological innovations

Step 2: Identify Patterns of Interaction/Integration

- Describe how driving forces could combine to determine future conditions.
- Identify the situations in the driving forces and if they would have either a positive or negative outcome (e.g., economy – little growth or fast growth).
- Identify the interaction of each future condition.
- Develop planning scenarios that are time-based on the combined situations in the matrix.

Step 3: Create Planning Scenarios

- Identify situations where stakeholders can recognize different realities over time.
- Create planning scenarios based upon the interaction of variables and time.

Step 4: Analyze Implications

- Apply planning scenarios that include transportation, land use and development, public investment, policy and environmental factors.

Step 5: Evaluate Planning Scenarios

- Utilize indicators relating to land use, transportation demographics, policy, environment, economics, technology and other criteria.
- Present planning scenarios to stakeholders and public.
- Review and refine planning scenarios.

Step 6: Monitor Indicators

- Develop planning scenarios when new data is available or new decisions/policies are made to address changing conditions.

Section 4. The New Paradigm

In planning for the impacts that COVID-19 will have on our cities and metropolitan areas, there is no one-size-fits-all scenario. Recent trends in population growth, along with the impacts of COVID-19 on our urban areas, will drive a diverse range of changes in cities and metro areas, depending on regional trends, local densities and underlying socioeconomic factors. While it is human nature to plan for the most predictable scenario, the most likely outcome is almost always one not anticipated. A scenario planning approach to developing and testing alternate futures will allow us to plan for effects that we don't fully understand and that could be difficult to anticipate. This is one benefit of scenario planning and perhaps one of the best reasons to apply this planning methodology to identify likely changes in how we live in our cities.

A CHANGING BASELINE

The baseline for measuring the impacts of COVID-19 on the built environment was already in a state of change. The U.S. urban areas have been experiencing increasing signs of stress. Even before the COVID-19 pandemic, many of the country's big cities and metro areas were already declining in population. Overall, the U.S. population is growing, but different regions and types of communities—urban, suburban and rural—are experiencing much different rates of growth or even population loss. The U.S. population's characteristics are changing as well. The U.S. is becoming more ethnically diverse and the proportion of older adults in our population is increasing. Housing affordability is a challenge nationwide.

Traditionally, planners would have projected current trends forward to understand and plan for future conditions. In the current environment, it is difficult to predict which of these factors will dominate and how multiple trends will come together. Recent trends could be temporary or become permanent to move cities in new directions that are not even being considered.

COVID-19 AND ACCELERATED CHANGE

In many of the densest cities, fear of COVID-19 has motivated many who are able to move outside from dense urban neighborhoods to lower-density areas outside cities. Families who had settled in neighborhoods to embrace an urban lifestyle have decamped to suburban or rural homes and have begun to work remotely. The need to isolate from our co-workers has forced a giant experiment in working remotely. While necessity instigated working remotely, changes in technology and communication have made working from home possible, with the unforeseen potential benefit of reduced work space needs and cost implications for businesses. Not all people who want to do this have been able to, but the prevalence of working remotely could be one of the most lasting impacts on the built environment.



While we are doing our best to isolate, we still need social interactions to live healthy lives and miss the random social interactions that urban living fosters. We long for those private places and public spaces now that they are no longer easily accessible and have developed a newfound appreciation for public open space and parks.

SCENARIO PLANNING IDENTIFIES THE NEW POSSIBILITIES

In planning for the future, we must expect the unexpected. We don't fully understand the effects that the COVID-19 pandemic will have on the built environment. Underlying trends were already underway. Some of these trends will accelerate while others will slow down. We also need to recognize the possibility of a future pandemic or similar public health crisis.

Much of the growth of urban areas was part of a trend toward walkable and transit accessible neighborhoods that foster a sense of community. However, the following questions arise:

- Will this trend continue in a different form?
- Will Americans move from living in dense to less dense environments? How will these changes affect cities and the urban form?
- Will people move within the same metro area? Or will trends push residents to other metro areas altogether?
- What will density and open space look like?
- How will changes in, and the broader adoption of, new technologies in communication and transportation affect how we live, work, shop and play? How will municipalities, agencies and the private sector plan for this future?

Using scenario planning, WSP can test the impacts on future density levels and design considerations to create alternative futures that will be influenced by multiple factors, such as advances in technology, telecommuting and social distancing, and assumptions for growth and investment. Scenario planning is especially useful when there are multiple influences and when solid data isn't available. It is the only way to plan when traditional trend-line projections will not adequately account for inputs and creative, out-of-the-box thinking is required. From these alternative futures, WSP assists clients to identify the most likely scenario to plan for, but with understanding that other outcomes are possible, and should still be considered in policy planning and funding choices.

ABOUT WSP

WSP USA is the U.S. operating company of WSP, one of the world's leading engineering and professional services firms. Dedicated to serving local communities, we are engineers, planners, technical experts, strategic advisors and construction management professionals. WSP USA designs lasting solutions in the buildings, transportation, energy, water and environment markets. With almost 10,000 employees in over 160 offices across the U.S., we partner with our clients to help communities prosper.

Contributors: Daniel Baer, Judy Jones, Aryeh Lemberger, John Loughran, Seth Torma, Rachel Van Metre

KEY CONTACTS

For more information on scenario planning, please contact:

Daniel Baer

Market Leader, Project Development
WSP USA

+1 212 465-5121

daniel.baer@wsp.com



wsp.com

CONTACT US

WSP USA
ONE PENN PLAZA
NEW YORK, NY 10119
+1 212-465-9600