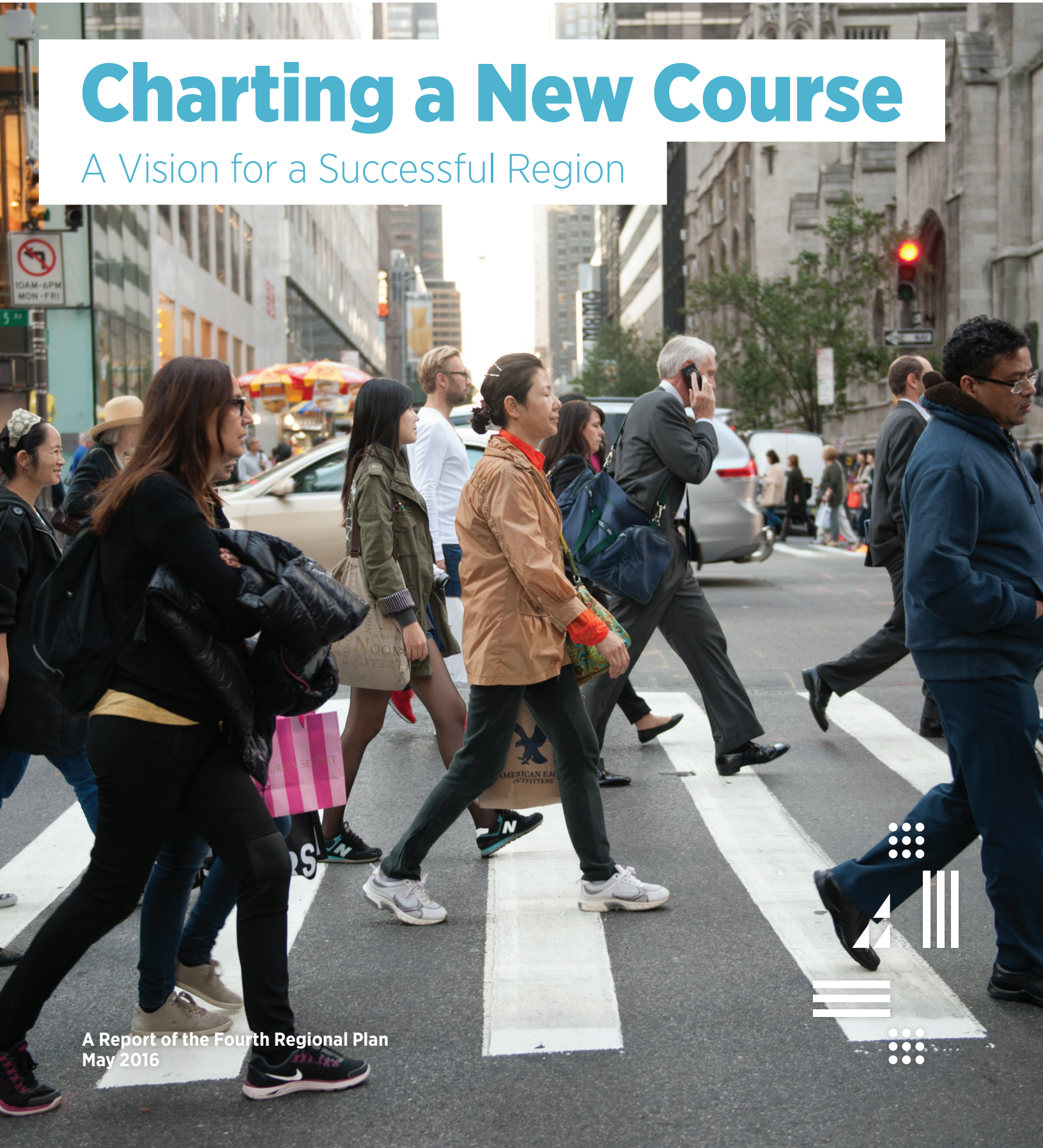
Regional Plan Association

Charting a New Course

A Vision for a Successful Region



A Report of the Fourth Regional Plan
May 2016

Nancy Borowick

What Will the Region Be in 2040?

More importantly – what do we want the region to be and what policies and investments do we need to achieve our vision of a prosperous, fair and resilient region.?

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Summary

A generation from now, the New York-New Jersey-Connecticut metropolitan area could be a place that fulfills its promise of equal opportunity; a coastal region that shows the rest of the world how to adapt and prosper in an age of rising seas and temperatures; and a global hub that harnesses its immense resources and innovative talent to make this fast-paced, expensive metropolis an easier, healthier and more affordable place to live and work.

But for now, a child born in 2016 faces a far different future. If current trends continue, twenty percent of our children will grow up poor, and most of them will never make it to the middle class. The average family will earn less and spend a greater share of its income on housing and transportation. By 2050, more than two million people will live in places vulnerable to repeated destruction and inundation from storms and flooding. New York's ascendance in the global economy could be a distant memory, as more nimble and organized metropolitan areas surpass us by investing in technology, transportation and the health and education of their residents.

To change course, our fragmented government institutions will need to greatly increase both the level and effectiveness of investments in infrastructure and housing. Both poor and middle-class will need access to more well-paying jobs and better schools. Our homes and workplaces will need to be made more resilient to the impacts of climate change, and significantly reduce emissions of greenhouse gases. Rather than resist growth and change, we can capitalize on an expanding economy to reduce poverty, improve health, make the region more affordable, protect and enhance our natural environment and insure that the benefits of growth are broadly shared.

To visualize what we are capable of achieving, as well as the dangers of staying on our current course, RPA has developed an aspirational vision for the metropolitan region. This framework draws on three years of research, analysis and engagement with policy experts, civic groups and community members throughout the tri-state area.

This report proposes ambitious but attainable outcomes that could be achieved if the region aspired to reach its full potential. These don't include every measure of success, nor do they include prescriptive policy proposals for how to achieve them. In 2017, RPA will release its fourth regional plan, A Region Transformed, with specific proposals and strategies to address our vast challenges and fulfill the vision of a prosperous, fair and resilient region.

In this report, **Reconnecting Growth and Prosperity** describes how the region's evolution in preceding decades has positioned it for strong economic growth, but also severed the connection between growth and broadly shared prosperity while neglecting problems that could undermine the region's future success.

What Will Shape the Region's Future frames what we know and what we don't know about the future, from the certainty of an aging population to the unknowns of how technology and climate change will affect the economy, settlement patterns and quality of life.

How Much Can and Should We Grow suggests that we should look at the question of growth differently. Rather than trying to predict how much we are going to grow, or how much growth we can handle, a better perspective is to focus on how we can use growth to achieve broadly shared goals—higher incomes, more economic security, more affordable and livable neighborhoods, cleaner air and water, and healthier and less stressful lives. Our potential for job and population growth is about twice as much as what we can expect if we continue our current path. If we build the right kind of homes, workspaces and infrastructure in the right places, we can sustainably expand job opportunities and housing choices for all ages, races, ethnicities and incomes, and generate tax revenues for community and environmental improvements. If we don't, demand will keep pushing up housing costs, subway and other infrastructure needs will be harder to fund, and upward mobility will be more difficult.

Scenarios for Future Growth describes alternative ways that that the region could develop over the next 25 years, including what is likely to happen if current trends continue. Each scenario emphasizes a different growth objective—enhancing the region's natural systems, reinforcing the urban core, concentrating growth in the region's downtowns, and reinventing the suburbs. Outcome measures show a wide range of implications for economic, equity and environmental goals.

An Aspirational Vision for 2040 details a growth scenario that would best support a future that would equitably expand the region's prosperity with more environmentally sustainable patterns of development. In this future, 44% of the region's new jobs would be in the urban core, where the region's robust transit network connects to the lion's share of the metropolitan area's workers. But downtowns and centers outside of the core would grow most rapidly, expanding by 26%, or 2.3 times the rate of the recent past. Jobs would return to small cities and suburbs that have stagnated in the last decade and a half, but in more transit-accessible locations.

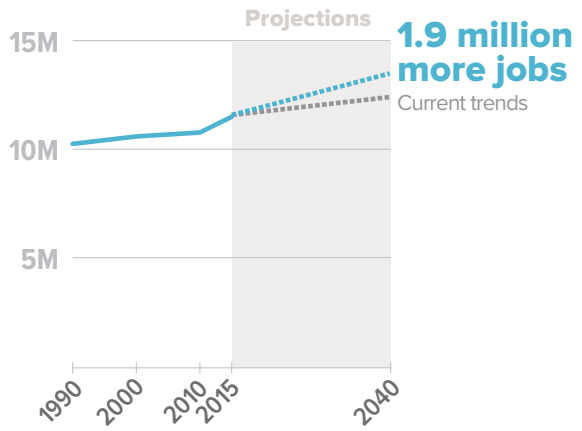
Population growth would be more evenly distributed, but with more in the region's core and inner suburbs as sprawl dissipates. New York City's population would grow to 9.7 million from its current 8.5 million, an increase of 14% compared with the 17% increase of the last 25 years. But the immediately adjacent counties of Nassau, Fairfield, Westchester, Bergen, Hudson, Union and Essex would expand at a faster rate, growing by 20%, largely because cities and suburban downtowns in these areas would become thriving mixed-income communities.

Measures of Success compares outcomes that the region could achieve with RPA's vision compared to a continuation of current trends. From these outcome measures, RPA proposes several goals for a more prosperous, fair and resilient region.

Create two million well-paying jobs throughout the region

With sufficient housing and infrastructure capacity, the region could gain an estimated 1.9 million more jobs by 2040, more than twice what is likely under existing trends, adding $760 billion to the region's economy and offering more chances for employment and higher incomes in industries ranging from health care to high-value manufacturing.

Total job growth, 1990-2040

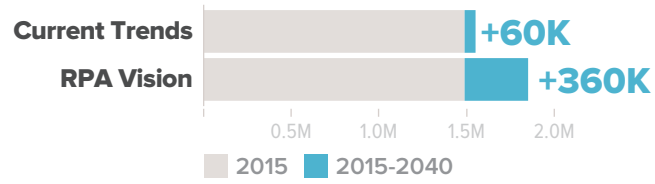


Sources: Regional Plan Association; Moody's Analytics

Expand jobs in poor cities and neighborhoods by 25%

Cities like New Haven, Newark, and Newburgh can reverse decades of job loss and add 360,000 jobs, six times as many as if current trends continue, expanding employment opportunities for residents and bringing in tax revenue to improve schools, safety and services.

Job growth in low-income cities, 2015-2040

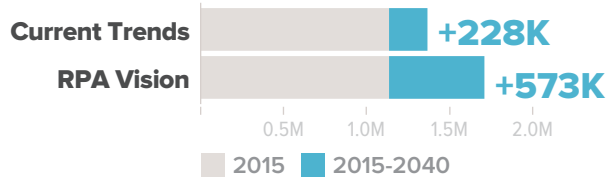


Sources: Regional Plan Association; U.S. Census Longtitudinal Employer-Household Dynamics data

Expand multi-family homes in affluent towns and neighborhoods by more than 50%

Through well-designed downtown redevelopment and infill, high-income communities can expand the number of multi-family units at more than twice the rate expected under current trends. Including low, moderate and middle-income units and strengthening fair housing laws and enforcement will increase the chances for everyone to go to a good school and have access to quality housing, jobs and services.

Increase in multi-family homes in high-income neighborhoods, 2015-2040



Sources: Regional Plan Association; U.S. Census American Community Survey

Reduce the average share of income going to housing and transportation to 45%

The typical household spent 51% of its income on housing, real estate taxes, utilities and transportation between 2009 and 2013. Bringing that down to a more manageable 45% will require multiple actions—increasing incomes, building enough new housing to meet demand, making government more efficient and reducing driving times and distances.

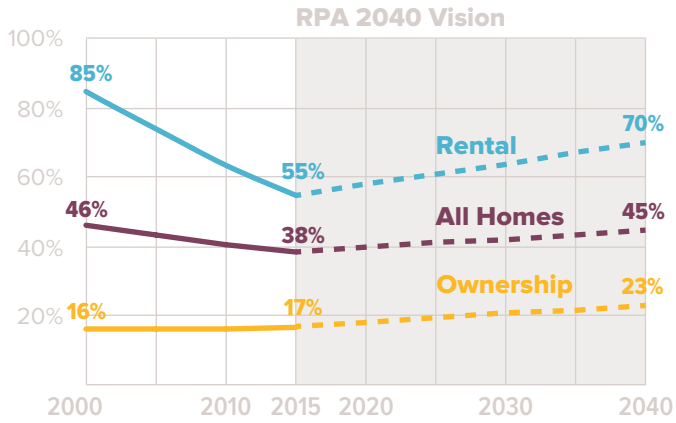
Share of income spent on housing and transportation for an average household, 2009-2013 and RPA's 2040 vision

Sources: Regional Plan Association; Center for Neighborhood Technology Housing + Transportation Affordability Index

Increase the number of homes affordable to low-income households to more than two-thirds of rentals and a quarter of owner-occupied homes

Solving the affordability crisis for residents with limited means will require aggressively preserving the low- and moderate-income housing that we already have and building more through inclusionary zoning and other means.

Share of renter-occupied and owner-occupied homes that are affordable to households at 80% of average regional income

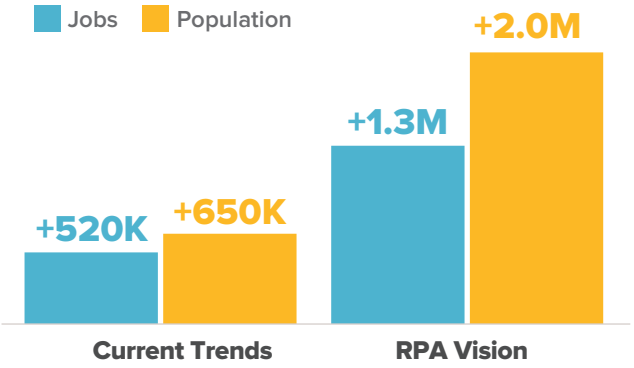


Sources: Regional Plan Association; U.S. Census American Community Survey

Attract three-fourths of new jobs and half of population growth to places within walking distance of transit

Transit investments and transit-oriented development can attract most new jobs and housing to places that are within a half-mile of a subway or commuter rail station, reducing automobile use and the time and cost of travel, increasing number of jobs within a reasonable commute of workers and expanding the labor force available to employers.

Increase in Population and Jobs Within a Half Mile of Existing Subway or Commuter Rail Station, 2015-2040

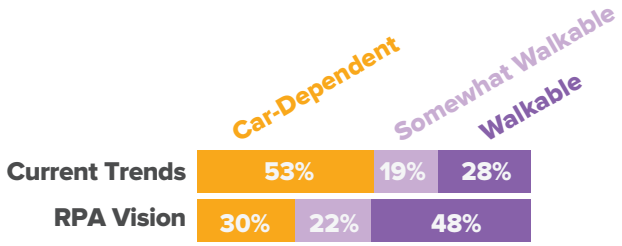


Sources: Regional Plan Association; U.S. Census America Community and Longtitudinal Employer-Household Dynamics data

Build two-thirds of new housing in existing or new walkable communities

We can build two-thirds our new housing in communities where people already enjoy better health and well-being by walking on safe, attractive streets with access to fresh food, parks, libraries and other needs, and transform other neighborhoods to improve walkability.

Share of new population in walkable communities

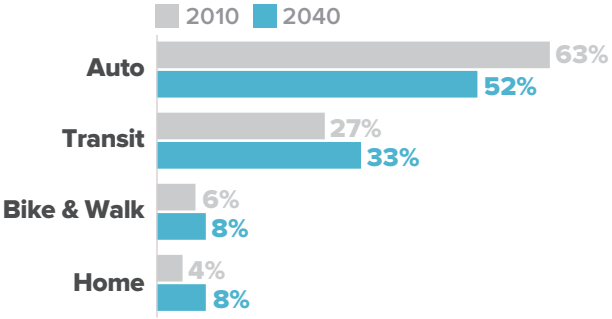


Source: Regional Plan Association; 2014 Walkscore®

Increase the number of people taking transit to a third of all work trips and substantially increase the share of people who walk or bike or work at home

Transportation choices can be increased and traffic congestion can be reduced with extensive transportation improvements, including modernization of existing bus, subway and rail service, new transit services, managing highway and road traffic, and by locating housing and jobs closer to transit.

Mode of travel to work, 2010 and RPA's 2040 Vision

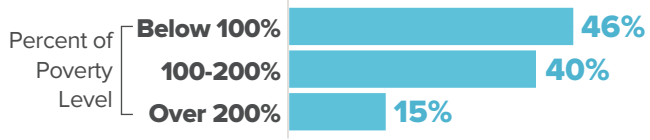


Sources: Regional Plan Association; U.S. Census Transportation Planning Package, American Community Survey

Provide all the region's residents with access to high-speed broadband service

High-speed internet is increasingly vital to accessing educational or employment opportunities as well as getting essential services. But 22% of the region's households lack broadband at home, and this is particularly true among low-income households.

Share of Households Without Broadband by Income Level, 2014

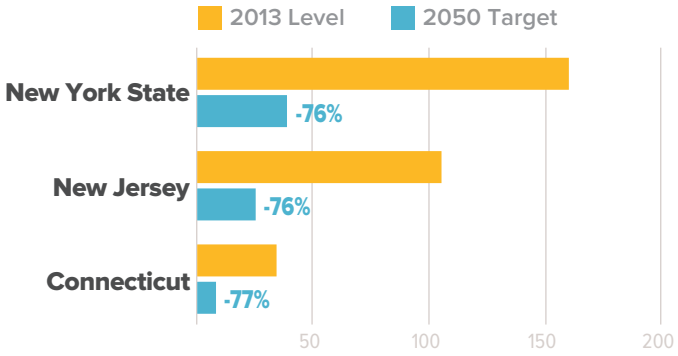


Source: U.S. Census American Community Survey 2014

Reduce greenhouse gas emissions by 80% by 2050

Achieving this ambitious goal adopted by New York City and all three states will require establishing more compact settlement patterns, generating cleaner power, reducing emissions from cars and trucks, and making our buildings more energy-efficient.

Greenhouse gas emissions



Sources: World Resources Institute; U.S. Energy Information Administration. Note: 1990-2011 data from WRI; 2012-2013 data from EIA.

Cut the predicted rate of open space development in half

With more sustainable development, the region could accommodate twice the level of population growth on half the amount of land than under the current trajectory.

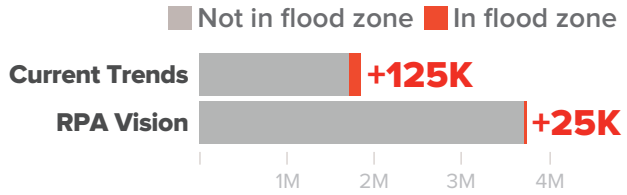
Consumption of open space

Source: Regional Plan Association

Reduce vulnerability for all 2.1 million residents most threatened by sea level rise, storms and flooding

Comprehensive strategies, from restricting growth in the most threatened areas to expanding both natural and engineered flood protection, can greatly reduce physical, social and economic vulnerability of residents living in the rapidly expanding flood plain.

New Population within the 2050 Flood Zone



Source: Regional Plan Association

Transforming the region will require a generation-long effort and new ways of addressing persistent and growing challenges. But we need to start now with clear-eyed understanding of what will be required.

Providing the housing that we need to make the region more affordable and generate enough economic growth to raise incomes means that we will need to increase housing production by 50% while limiting displacement, preserving and increasing the amount of low, moderate and middle-income housing, and improving quality of life.

Creating better places to live means that we need to not only provide enough affordable housing, but also the schools, parks, sewer capacity and other infrastructure needed accommodate 3.7 million new residents in more livable neighborhoods.

Keeping the region competitive with its global peers and making this an easier place to live and work means that we will need to provide the capacity for a 1.4 million increase in work trips while improving service and transforming the transportation system to support a region with rapidly changing travel patterns and needs.

Protecting more than two million people vulnerable to flooding will require renewed respect for our natural environment. This will require a new relationship with our shoreline, learning to live with water as well as both expanding our concept of infrastructure to include our wetlands, waterways and forests and investing in new engineered systems.

To be able to achieve all this, there is the need to overcome our fragmented governance systems and remake institutions that were created for a different time with different needs. Over the next year, RPA and its partners will develop a comprehensive strategy that addresses these and other challenges. The new regional plan, A Region Transformed, will build on the legacies of the past while mobilizing the innovation and energy of a new generation.

Reconnecting Growth and Prosperity

In the past two decades, the New York metropolitan area has been transformed from a region that was losing its place to one of the world's leading economies. In the early 1990s, the region was mired in its worst recession since the 1930s, its economic performance had lagged behind the nation for decades, and cities from Tokyo to London seemed poised to leave New York behind in the competition for high-value businesses. Suburban office parks were beginning to lose their appeal, and manufacturing companies that had anchored economies in New Jersey, Connecticut, and Long Island were leaving or closing shop. Just as investments in housing and transit were starting to reverse neglect and deterioration in many neighborhoods, a surge in crime in the mid-1980s threatened to undo this progress.

By 2015, New York was ranked as the most powerful and influential metropolitan economy in the world by many indicators. The region's job growth is keeping pace with the U.S. overall, while New York City is surpassing the rest of the country. Dramatic reductions in crime and renewed investment in housing, transit and public spaces have made downtowns and urban neighborhoods far more attractive to residents, employers and tourists.

The benefits of the stronger economy have been uneven, leaving many behind and a number of unaddressed problems that could curtail the region's future prosperity. Income growth has been stagnant for the majority of households, and rising costs, particularly for housing, have muted economic gains and impeded upward mobility. Low- and moderate-income households are priced out of a growing number of urban neighborhoods, and the economies of smaller cities and suburbs haven't grown as rapidly as New York City's. As much as the region has invested in restoring and expanding its infrastructure, other metropolitan economies are investing far more.

The challenge for the region's employers, workers and public officials is to restore the historic link between economic growth and broadly shared prrosperity. Some aspects of this challenge are clear, from the region's high costs to the nation's inability to generate enough middle-income jobs. Others are more uncertain, such as the long-term productivity of the U.S. economy and where millennials and their children will prefer to live as they age.

Assessing how these forces will shape the future, and preparing for unforeseen circumstances, is central to the plan that Regional Plan Association is preparing for the 31-county tri-state metropolitan region, the fourth in RPA's 94-year history. This blueprint will include recommendations for land use, housing, transportation, energy, and the environment to promote the region's shared prosperity, livability, sustainability, and good governance for the next generation. These goals will require economic growth that is robust, equitable and sustainable, communities that are healthy and resilient, and institutions that are effective and fair.

To help determine which policies and investments are needed to achieve these goals, RPA has crafted a vision of what the region can and should be over the next 25 years. This report describes the components of that vision—potential job and population growth that the region should plan for, alternative scenarios for how the future could unfold, and measures of success for an aspirational future that improves quality of life for everyone who will live in the region over the next quarter century and beyond.

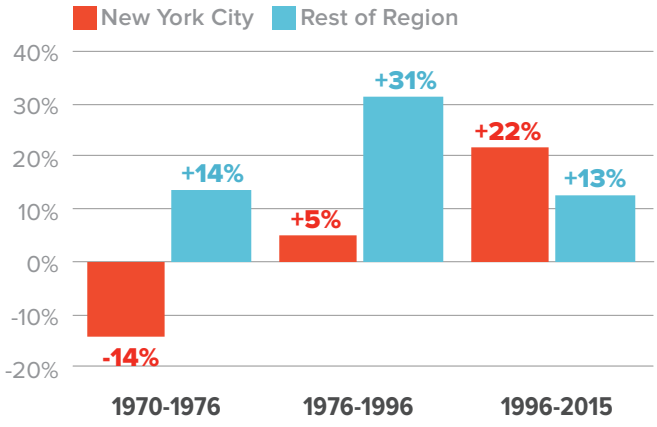
From Fiscal Crisis to Global Leadership

The metropolitan economy has experienced several long waves of growth and change since the mid-20th century. From the end of World War II to the end of the 1960s, a robust national economy and a growing middle class helped buoy the region's prosperity, even as national and local policies fueled rapid suburbanization and the flight of both jobs and people from New York and other cities.

By the early 1970s, a confluence of forces led to New York City's fiscal crisis and a declining economy for the region as a whole. Two national recessions, an acceleration of manufacturing losses and a protracted bear market on Wall Street led to the collapse of financial underpinnings that had been eroded by years of fiscal mismanagement. New York City lost more than 500,000 jobs, or 14% of its employment base from 1970 to 1976. While the rest of

the region fared better, it had no net new jobs over this six-year period, a far cry from the rapid and nearly uninterrupted growth of the 1950s and 1960s. The declines led to even further disinvestment in the region's infrastructure and in urban housing, schools, and services.

Figure 1: Percent Change in Total Jobs, 1970-2015



Source: Moody's Analytics; Bureau of Labor Statistics

Recovery started slowly in the late 1970s and gathered momentum in the 1980s. Job growth was interrupted only by the 1981-82 recession, which hit manufacturing-based regions harder than the tri-state's service-oriented economy. Both fiscal health and public services were gradually restored, and capital investment began the long process of returning the region's transit network and much of its housing stock to a state of good repair. Job growth remained strongest in the suburbs, particularly along highway corridors such as Rte. 1 in New Jersey, I-287 in the Hudson Valley and Rte. 110 on Long Island, where office and industrial parks attracted corporate headquarters, high-value manufacturing, research and development, and professional services.

But this long expansion still left the region lagging behind the nation, and large concentrations of poverty from Trenton to New Haven remained deeply entrenched. By the end of the 1980s, the region headed into its worst downturn since the Great Depression. All parts of the region suffered deep job losses as a relatively mild national recession was magnified locally by a steeper dive in the financial markets, corporate consolidation that downsized both urban and suburban office jobs and the end of the Cold War that wiped out much of the remaining defense-related manufacturing in New Jersey, Connecticut, and Long Island. Rising crime accelerated outmigration from the region's cities, and municipal services were cut back again in the face of plummeting tax revenue.

A turnaround eventually began with a rising stock market that turned into one of the longest bull markets in history. Financial services fueled much of the employment and income growth in two strong expansions from 1992-2000 and 2002-2007, accounting for nearly a third of income gains in both periods and driving growth in other sectors. But New York City's crime rate also declined sharply after peaking in 1991, and other parts of the region followed. Along with an improving transit system and revitalized neighborhoods, often the result of targeted community investments, this improved public safety made the region more attractive to both global and domestic businesses. Tourism surged, and population-related services such as health and education experienced rapid job growth. An emerging technology sector added a new dimension to the region's economy. Even the terrorist attacks of Sept. 11, 2001, caused only a temporary halt to the economies of New York City and the larger region.

The 2008-2009 financial crisis ended the long expansion. As badly as the region was affected, its job and income losses were less severe than in other parts of the U.S., in spite of the region's concentration of banks and financial institutions that were at the heart of the crisis. In part, this was due to the federal infusion of capital into the system.

But the recession and its aftermath also revealed an economy that had been largely remade since the early 1990s, one in which long-held assumptions are no longer applicable. Financial services are still the region's most important industry, but growth in sectors from technology to tourism has reduced dependence on highly cyclical financial markets. In a reversal from most of the postwar period, New York City is outpacing job growth in the suburbs. The region's economy is keeping pace with the rest of the country, and its international standing is higher than it has been in decades. Affordability has become a central rather than peripheral problem as average incomes have failed to keep pace with rising costs. Income disparities have continued to widen, both within the region and in the nation as a whole.

How the region continues to evolve and develop will depend on the durability of these trends, and whether unforeseen changes will once again change its trajectory.

Growing Diversity and Generational Change

From its earliest days, the region has been more racially and culturally diverse than most of the U.S. . Today it is nearly impossible to capture the place and its people with a few images or statistics. Immigration has added more racial and ethnic complexity to a population that is half non-white, and in which the most rapid changes are occurring outside of New York City. The region has become more economically polarized, with changing geographic

patterns of wealth and poverty. Generational change is altering needs and preferences for housing, work, travel and recreation.

The transformation resulted from a combination of predictable demographic changes, economic cycles that changed patterns of migration, and policy decisions with often unforeseen consequences. The aging of the large baby boom population (those born between 1946 and 1964) could be forecast with precision, but few predicted the drop in birth rates in the 1960s or the rapid increase in immigration during the 1970s and 1980s. Both were triggered by changes in federal regulations—the legalization of the birth control pill in 1960, and the Immigration and Naturalization Act of 1965, which abolished immigration quotas based on national origin.

Future population growth and change will be determined by a similar mix of foreseeable and unexpected changes. The baby boom generation will complete its transition into its retirement years, swelling the ranks of the elderly. Millennials, those born roughly from 1980 to 2000, will move into their prime work years. The region will continue to become more racially and ethnically diverse, even if immigration slows, simply because blacks, Hispanics and Asians are younger than whites, and therefore will have more births and fewer deaths over the next 25 years.

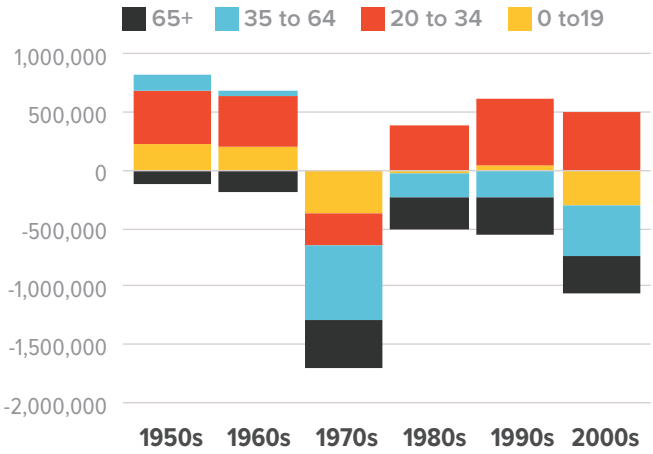
The biggest unknowns are international and domestic migration. Immigration, especially from Asia and Central and South America, has been the mainstay of the region's population growth since the 1970s. But migration to the U.S. has started to slow, and changes in immigration policy could affect who and how many enter the metropolitan area in the years to come. Domestic migration, those moving to and from other parts of the U.S., can fluctuate considerably with both real and perceived differences between this and other regions in the things that generally motivate people to move—economic opportunity, affordability, and quality of life.

The past history of migration in the region is a combination of persistent patterns and big shifts in numbers. Figure 2 shows net migration (the number of people moving in minus the number of people leaving), both foreign and domestic, to the region by age from 1950 to 2010. In spite of differences in numbers across the decades, the chart shows a consistent pattern of life cycle choices. Young adults move into the region, particularly in urban areas, attracted by career opportunities and lifestyle choices. Older adults, especially those in their retirement years, are more likely to leave than move into the region, with large numbers moving to warmer, less expensive locations.

Within these larger patterns, both global and regional economic cycles created large fluctuations in migration. In the 1950s and 1960s, a strong postwar economy resulted in net in-migration for every age group except those over 65. By contrast, steep economic decline in the 1970s resulted in net out-migration in almost every age group, with close to 1.7 million more people leaving the region than moving in. Since 1980, the only age group with net in-migration was the 20-34 year old cohort. But out-migration from other age groups was more muted than in the 1970s.

Overall, there were relatively even numbers of people moving into and out of the region in the 1980s and 1990s. Half a million more people moved out of the region than into it from 2000-2010, in spite of economic growth that was on par with the rest of the U.S., possibly because housing affordability worsened more than in other parts of the nation.

Figure 2: Age-Specific Net Migration to the Tri-State Region, 1950s-2000s



Source: Age-Specific Net Migration Estimates, Applied Population Laboratory, University of Wisconsin-Madison

What Will Shape the Region's Future

Future growth and development will be shaped by the dynamic between external forces and our own choices in how and where we invest in human resources and physical infrastructure. The social, economic, and environmental trends that are largely outside of the control of state and local governments, businesses and institutions can be anticipated to some extent, but preparing for the unforeseen is as important as trying to predict future outcomes. Making the best possible choices for the future requires distinguishing between changes that we can predict with relative certainty from complex issues that we can only hope to better understand. In short, it means being clear about what we know and what we don't know, what we can reliably plan for and where we need to be prepared to change course as events unfold.

Things We Can Count On

The number of older adults will swell as the working age share of the population shrinks.

The baby boom generation will once more shift demand for services for everything from transportation to housing as it moves into retirement years. By 2040, the youngest boomer will be 76 and the share of the population over 65 in the region will grow to as much as 23% from 13% in 2010. The smaller generation X, now in their late 30s to early 50s, will move from their prime work years toward retirement, while the larger millennial generation is still entering the labor force. This transition will affect lifestyle trends, consumer preferences and work choices for the population as a whole. But it will also mean that there will be fewer people in their work years relative to the number of young and old. That could mean that workers with the right skills will be in greater demand. It could also mean that fewer jobs will be created if there aren't enough workers to fill them. Both household and government budgets could be squeezed to take care of a larger dependent population. One unknown is how much of the gap will be filled by older adults staying in the workforce longer than previous generations.

We will become even more racially and ethnically diverse.

For decades, the non-Hispanic white share of the population has declined as the number of blacks, Hispanics and Asians have increased. The region is now evenly divided between white and non-white residents. Even if immigration slows, and chances are that it will remain a primary contributor to the region's population growth, just the fact that the non-white population is younger means that natural aging and child births will lead to larger shares of Asians and Hispanics in particular. Non-Hispanic whites in 2010 made up 64% of the region's population over 50, but only 46% of those under 30. Diversity is an asset in the global economy, but the combination of racial and generational divides can be a source of political and social tension. A major question is whether the region's segregated residential patterns will decline or increase. There has been only a slight decrease in segregation in spite of the region's rapid change in racial and ethnic composition, and the New York region remains one of the least integrated metropolitan areas in the U.S.

There is a shrinking amount of developable land. Seven decades of urban sprawl have consumed much of the metropolitan area's easily-developed land.

Much of the remaining undeveloped, unprotected open space is environmentally sensitive, difficult to develop because of its topography, or far from employment locations. That means that most new growth will need to be accommodated with higher densities in currently developed areas, either through infill, taller buildings, or the redesign and more intensive use of existing space. This may be consistent with current demand from businesses and residents, and with more sustainable patterns of development, but it can also make building new homes and places of work more difficult and expensive, and often meet stronger resistance from existing residents.

Our infrastructure is old and often ill-equipped to meet modern service needs or increased demand.

Much of the region's physical infrastructure, including most of its transit network and water system, was built 50-100 years ago and is badly in need of repair and modernization. And yet transit ridership, water consump-

tion and energy use have never been higher, and service demands have changed with the economy and technology. Without upgrading and retrofitting these systems, it will be impossible to keep pace with changing demand, much less accommodate future growth.

Climate change will redefine our coastlines and make us increasingly vulnerable to storms, extreme heat and rising sea levels.
There is no remaining doubt that global temperatures will continue rising, even if greenhouse gas emissions are substantially reduced. The speed and magnitude of change are uncertain, as are the frequency and severity of storms and heat waves. But in planning for the future, we need to anticipate how the natural environment is going to change as a result of past development and build in ways to adapt to unforeseen changes.

What We Don't Know

Long-term growth in productivity in both the U.S. and global economies could cover a broad range over the next 25 years.
The region's growth and prosperity is reliant to a large degree on how robust the national and international economies will be. The most important factor for jobs and income is the rate of productivity growth. Productivity has risen more slowly since the early 1970s than it hadthroughout most of the 20th century, and there is a great deal of debate in how changes in technology, educational attainment, and an aging workforce will change both productivity and gross domestic product in future decades.

Continued wage stagnation and income inequality is expected, but not certain. Average wages haven't grown for decades.
As with productivity, there is little agreement on what is causing it, with technological displacement, global competition, lagging educational attainment and weaker unions among the most common explanations. Much of the rise in inequality, both nationally and in the region, also can be attributed to stagnant wages, with more income coming from investments than earnings, and a decline in middle-income jobs while growth was concentrated in high- and low-paying jobs. It is difficult to see an end to a trend as durable as this one, although some economists contend that wages will begin to rise and the income gap will start to close if the U.S. becomes more competitive, or if education gains start to boost middle-income earnings.

New York's dominant position in the global economy could begin to erode as other metropolitan regions invest in modern infrastructure, housing and education.
Only two decades ago, New York was in a much weaker position relative to other international centers of commerce, and its current ascendancy can't be taken for granted. The region can maintain and improve its position through investments and policy, but it can't control the level or success of investment strategies in other regions, many of which have been far more assertive in modernization and capacity improvements in airports, transit, business districts and housing.

The choices of millennials and their children on where to live and work will have a significant impact on the economic success of the region, as well as the form that future development will take.
Part of the region's recent success, and New York City's in particular, comes from a shift in preferences by people in their 20s and 30s. They are renting and living in cities longer than their parents, driving less and and marrying and having children later. This makes compact transit-rich places like the tri-state region more attractive to workers and their employers. It also gives central cities advantages over more dispersed, auto-oriented suburbs. Whether these preferences will change as millennials age, and whether their children and new immigrants will make similar decisions, is the subject of considerable debate.

Technology's impact on how we live, work, travel and communicate is a constantly changing story.
Personal communication and other technologies have already had a profound effect on work hours, commuting patterns, education, and social networks. More people are working at home, and travel is increasing most in evening and off-peak hours. Expectations for on-demand, 24-7 delivery of information, goods and services, from stock prices to car services, have become the norm. Access to broadband capacity is now a major consideration for corporate location decisions, and another element in disparate access to opportunity between the poor and the well-off. Self-driving automobiles and other transportation technologies are likely to be introduced. How much and in what ways behavior will change in response to these technologies, and whether they can be help revitalize communities and improve access to education, jobs and other services, will be a major influence in how the economy evolves and who it benefits.

How Much Can and Should We Grow?

A growing economy is a foundation for improving quality of life. A robust economy creates more job and business opportunities, reduces unemployment, gives people more chances to get ahead and generates tax revenue that can be used to improve municipal services, modernize infrastructure, protect environmentally sensitive land, expand parks, build more affordable housing, or hold down tax rates. But growth also requires more homes, offices and schools to be built. It can increase congestion and pollution, and puts more strain on both the natural and built environments. Frequently, there is a disconnect between those who benefit most from economic growth and those who bear most of its burdens. This dynamic fuels local resistance to new development that may be necessary to expand prosperity and opportunity, but that brings neighborhood change that can benefit outsiders more than current residents and businesses. And when a growing economy fails to lift average incomes or increases housing and other costs, even its wider benefits are called into question.

The dilemma is often posed as the question of how much growth is good, or how much growth we can handle. A better way to frame it is to ask how we can use growth to achieve broadly shared goals—higher incomes, more economic security, more affordable and livable neighborhoods, cleaner air and water, and healthier and less stressful lives. This acknowledges that an expanding economy is necessary to achieve these goals, but that the type of growth and how we grow are as important as the pace of the economy.

This also implies a different approach to projecting future growth. Rather than trying to predict what will happen--an exercise that will nearly always underestimate, exaggerate or miss emerging and future trends--it involves projecting what could happen, and evaluating what would need to occur to maximize the benefits. That means making sure that there is enough supply of the right kind of homes, work spaces, and infrastructure to meet demand, so that prices aren't bid up. It also involves incenting employers, developers, public officials, and others to build or preserve housing and jobs in places that do the most to expand opportunity and benefit the environment, and to design these in ways that make communities both more economically successful and more livable.

The starting point is to forecast how much the tri-state area has the potential to grow, given past trends, current capacity, and all the uncertainties described earlier. The projections described below were built off a national econometric model that forecasts jobs, gross domestic product (GDP), and other variables for both the U.S. as a whole and for separate metropolitan regions, including the New York region. Using employment projections from this model, RPA projected population and labor force to determine how past trends in migration by age and gender would be likely to change as more jobs become available.

Job Growth at Full Potential

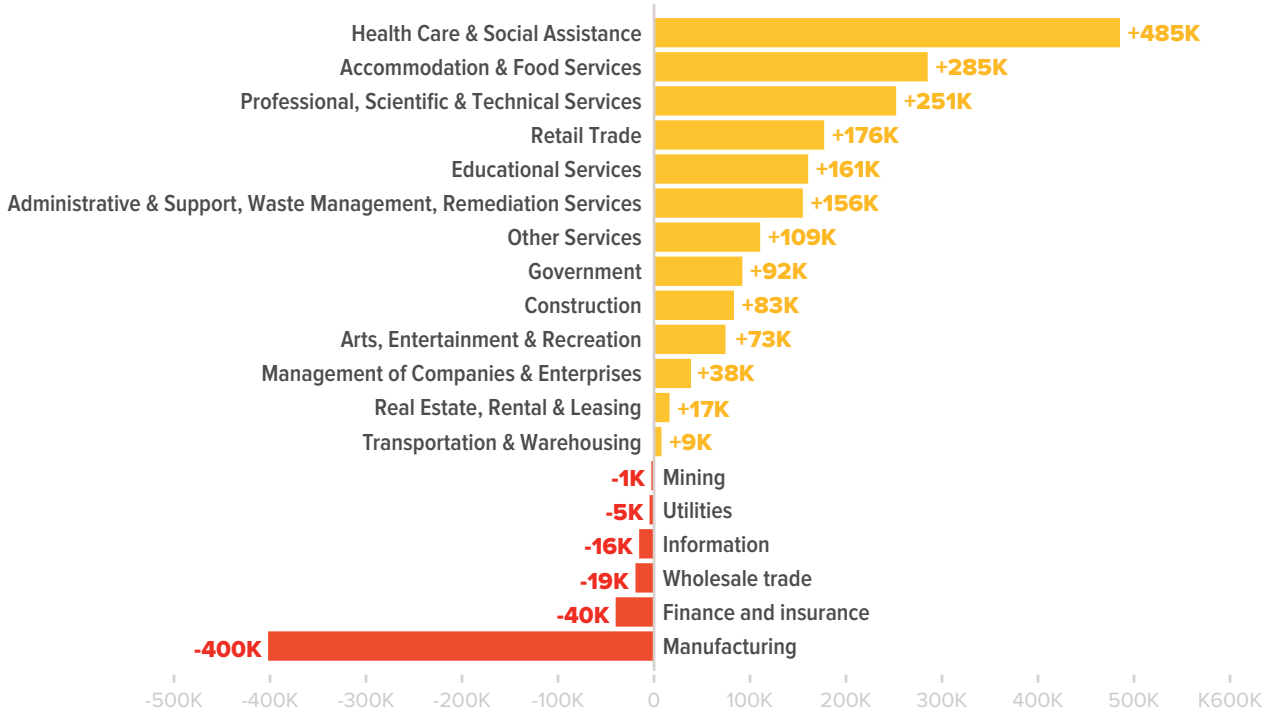
The long-term trajectory for job growth starts with considerable momentum. Seven years after the 2008-2009 financial crisis, the New York metropolitan area is performing well compared with the U.S. economy, gaining nearly 700,000 jobs since the recession ended. New York City emerged from the recession earlier and stronger than the rest of the country, and job growth in the region is keeping pace with national growthh. The U.S. economy is stronger than most of the rest of the world. Still, sluggish wage growth and declining participation in the labor force are reminders that the recovery is far from complete.

The pace of job growth during the current recovery is unsustainable over the 25-year period of our future forecast. Future recessions are inevitable, and will hold down the long-term average rate of growth.

In projecting forward to 2040, the period from 1996-2014 is a relevant period for comparison.[1] Over that 18-year period, jobs grew at the rate of 0.8% per year, or an aver-

1 In benchmarking future growth, it is important to select a historic period that is likely to be most comparable to the future. Looking at too short a period will give too much weight to recent cyclical and short-term trends, while going too far back can miss the importance of structural changes that may have occurred over the time period. It is also important that the beginning and end points fall at similar points in the business cycle. Many of the economic forces driving current growth patterns in the region emerged in the early to mid-1990s. The region strengthened its competitive position relative to the rest of the U.S. and other global centers. The growth was the product of several converging trends, including strengthening demographic and business preferences for major urban centers, major improvements in public safety, transit and other conditions and a diversifying mix of industries with high global demand. Digital technologies also became more ubiquitous in the 1996-2014 period with growing use of the Internet and social media, leading to changing industry and employment structures. The beginning and end years of the period

Figure 3: Change in Jobs by Industry,1996-2015



Source: Moody's Analytics, Bureau of Labor Statistics

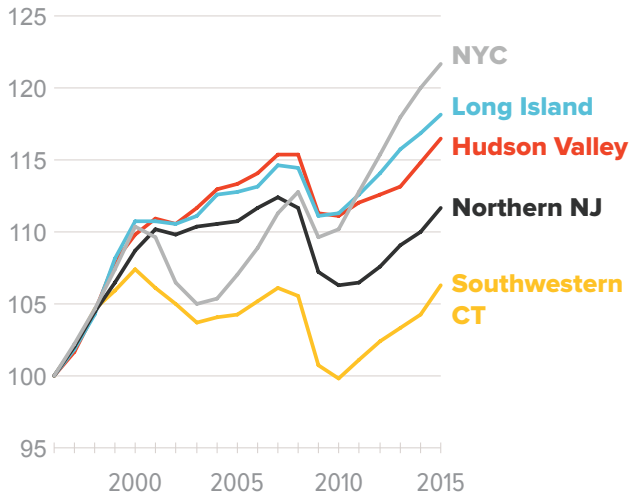
age of 58,000 jobs annually. The biggest job growth came from high-wage sectors such as professional and technical services and management services, low-wage industries such as retail and food services, and health care and education, which showed growth across occupations with a broad range of skills and incomes. Financial services, which provided much of the region's growth in earnings, actually declined slightly in employment, partly because of continuing fallout from the financial crisis. Manufacturing continued its long-term decline, falling at the rate of 3% per year.

Unlike the preceding decades, New York City grew faster than any other part of the region, slightly more than Long Island and the Hudson Valley, twice as much as northern New Jersey, and much more than southwestern Connecticut. This pattern strengthened over the last decade. From 1996-2001, New York City grew at a rate similar to the rest of the region. It declined relative the rest of the region in the years immediately following 2001, but since 2004 has grown much faster than the rest of the region.

Many of the factors contributing to these trends appear to be durable. Both domestic and global cities that have dense concentrations of high-skill workers like New York are increasing their dominance in high-value, high-wage industries. Millennials, many now in their 30s, are still favoring walkable, transit-oriented places more than their parents did at the same age. Retiring boomers, too, are

are comparable, with both coming four years after the trough of the region's two deepest postwar recessions, and the period as a whole includes two strong expansions followed by recessions.

Figure 4: Job Index from 1996-2015 for Subregions



Source: Moody's Analytics, Bureau of Labor Statistics

showing a strong preference for less auto-dependent places, and many are looking to move to smaller, more centrally located homes.[2] Even if the majority of millennials live in suburban communities as they get older, the share living in cities or small downtowns will still likely be large enough to anchor significant urban growth. While many of the industry trends are likely to moderate, sec-

2 Eighty percent of 18-34 year-olds would like to live in places where they don't need a car to get around (Rockefeller Millennials Survey, Rockefeller Foundation and Transportation for America, 2014), a finding that would have been unlikely with baby boomers at a similar age. A survey by the American Planning Association (Investing in Economic Growth and Competitiveness, 2014) found convergence of current preferences across generations, with millennials, boomers and Generation X'ers born in between desiring to move away from auto-dependent neighborhoods.

tors such as professional services, health, education and personal services are likely to remain the biggest job producers. Conversely, industries with a large share of jobs vulnerable to automation, such as retail, may see smaller growth or even declines.

Potential for Two Million New Jobs by 2040

After evaluating several existing forecasts for the region, the one that most closely follows the preceding assumptions is produced by Moody's Analytics. Moody's regional forecasts are derived from their U.S. macroeconomic model of all of the sectors of the U.S. economy, including production, income, financial markets, consumer spending, and labor markets. State, metropolitan area, and county forecasts are driven by regional variables such as local costs of doing business and are reviewed by analysts to ensure that the forecasts are consistent with the national model and regional conditions. Their assumptions and outcomes are consistent with national demographic forecasts and the region's recent strength relative to the national economy. Moody's forecast includes the following predictions:

- Productivity growth in the U.S. rebounds from the low rate of the post-recession period.
- National GDP and employment grow more slowly compared with historical trends due largely to slower workforce growth stemming from an aging population and declining fertility rates.
- Employment growth is greatest in industries with both high demand and occupations that are difficult to automate.
- The New York region's share of the national economy declines modestly. From 2014 to 2040, the region's share of national payroll employment declines from 8.8% to 8.2%. This is a somewhat faster rate of decline than from 1996 to 2014, when it declined from 9.0% to 8.8%, but much less than in the 1980s or early 1990s.
- New York City and other parts of the region grow at comparable rates. The predominant trends of the last two decades could argue that New York City will continue to grow at a faster rate, but some convergence with the region's other sectors is reasonable.

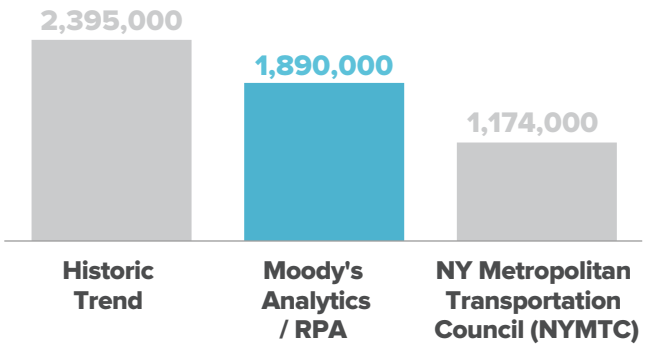
The Moody's job projections didn't include the self-employed, which include about 1 out of every 10 workers in the region. In order to arrive at a count of total projected jobs, RPA applied the current ratio of self-employment to payroll employment throughout the forecast period and added to the Moody's employment projections. This increased the total number of regional jobs by 11% in 2040, from a total 12,154,000 payroll jobs to 13,507,000 jobs including the self-employed.

The resulting payroll + self-employed forecast projects **1.9 million additional jobs from 2015 to 2040** in the New York metropolitan region. That averages 76,000 jobs per year, or 0.6% annually, compared with 58,000 and 0.8% in the 1996-2014 period. This rate of growth represents the region's potential growth if the U.S. economy performs as projected. Two reasons explain why the economy will produce jobs at a slower pace even as the region remains competitive with the rest of the U.S. There will be fewer workers to employ, and more opportunities to replace workers with technology.

Up until now, job growth has been fueled by a steady stream of new workers—baby boomers entering the workforce as they reached their 20s and 30s, women choosing to work in increasing numbers, and immigrants providing a steady stream of workers eager for a variety of jobs. The first trend has now reversed as boomers enter retirement, while both women entering the workforce and immigrants entering the U.S. has probably plateaued. And the means to replace workers with scanners, robots, and other technology will be at least as strong in the future as it has in the past.

The RPA-adjusted Moody's forecast also projects much larger job growth than some other forecasts, including that of the New York Metropolitan Transportation Council (NYMTC), which form the basis for planning by the region's transportation agencies. NYMTC's forecast of 1.1 million additional jobs by 2040 would see jobs growing at less than two-thirds the rate of the adjusted Moody's forecast.

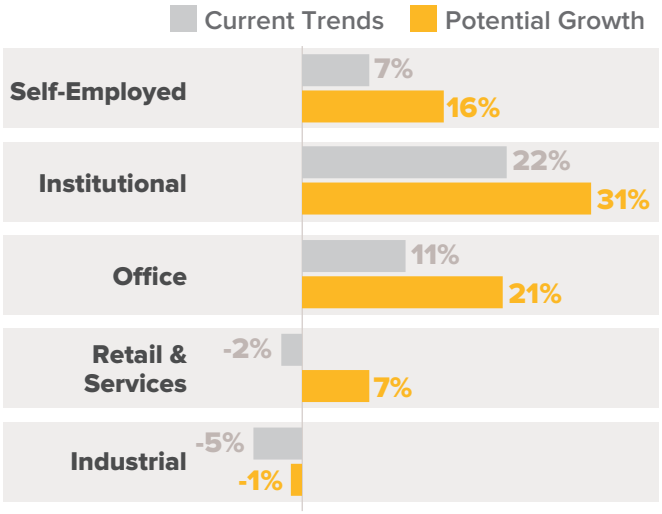
Figure 5: Job Growth Forcasts



Sources: Regional Plan Association; Moody's Analytics, Bureau of Labor Statistics; Metropolitan Transportation Council

The differences stem to a large degree from differences in the method and assumptions of the forecasts. The Moody's forecast emphasizes the region's ability to capture national and local demand based on the region's relative strengths and changing trends. Constraints are cap-

Figure 6: Job Growth by Sector, 2015-2040



Source: Regional Plan Association; Moody's Analytics, Quarterly Census of Economics and Wages

tured implicitly to the extent that the region's high relative costs result from past limits on housing supply or other constraints. By contrast, the NYMTC forecast puts greater emphasis on the region's development constraints. It uses third-party forecasts, including Moody's, as a base, and then adjusts industry totals on a county basis to account for local development capacity.[3] Given the differences in approach, the Moody's forecast is a more appropriate basis for determining how much the regional economy could grow based solely on demand and competitiveness with other domestic and international regions, unconstrained by the supply of housing, transportation and other infrastructure.

The adjusted Moody's forecast doesn't represent the highest possible job growth for the region. If either global or national growth is stronger than Moody's baseline prediction, then the region could see more job growth even if the region's relative competitiveness remains unchanged.

The type of job growth will affect the type of skills that are needed and the type of work spaces the region will need to create. Compared with past trends, the adjusted Moody's forecast projects more moderate declines in manufacturing, slower growth in retail trade, modest growth in finance and slower growth in nearly every service category, whether in export industries like professional services or locally driven industries such as health care and social assistance. Differences between past trends and future growth are consistent with slowing growth in the working age population and potential for labor-reducing automation in industries from retail trade to health care. They don't necessarily mean that wages will continue to stagnate or that income inequality will get better or worse, because there could be substantial change in the types of occupations and skill requirements within industries.

The largest share of the growth, about one million jobs, will be in office industries such as finance and professional services. At current rates of office space per worker, that could require as much as 200 million square feet of office space, about eight times the amount projected to be built in the Hudson Yards district of Manhattan. But employers are putting more workers into less space, a trend that is likely to continue and hold down the amount of new space that is needed. Industrial jobs—manufacturing, transportation, warehousing and construction—are projected to decline slightly, but space will be needed for a million workers in factories, warehouses and other industrial locations. Retail and service jobs will grow much less than in the recent past, while health and education will still represent the fastest growing sector. The demand for hospitals, other medical institutions and higher education facilities is likely to continue growing throughout the region, while the need for new primary and secondary school space will vary by the demographics of different localities.

A Larger and More Diverse Population

Several converging trends will shape the tri-state area's population and labor force in the next 25 years. The fastest growing age group—those over 65—is also the cohort that has consistently had more out-migration than in-migration. Compared with previous decades, older adults are healthier and work longer, which could delay post-retirement migration. The age group that has nearly always had more people moving in than moving out—people in their 20s and early 30s—is likely to be sought after throughout the U.S. as a shrinking labor force puts a premium on new entrants to the workforce. So far, the region has retained its appeal for young adults. The flow of new immigrants to the region is likely to continue, but the number and composition could change in response to changes in relative wages in other parts of the world or to new national policies regulating immigration.

The factors that will have the biggest influence on migration, and therefore on population growth, are career opportunities and the cost of living. The chance to prosper and get ahead has always been the region's primary attraction, while lack of affordability, particularly high housing costs, is arguably its main inhibitor. So the number and quality of jobs that are created and the relative cost of living compared with other regions will be the main determinants of how much the region's population grows. Job and population growth are mutually reinforcing. More jobs attract more people and a larger labor supply attracts

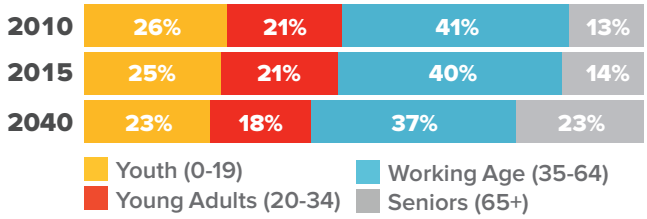
3 A full explanation of the process can be found in *Draft 2050 Socioeconomics and Demographics Forecast Report,* New York Metropolitan Transportation Council, March 2015.

more employers. But population growth and housing costs can be inversely related. Unless enough housing is created to accommodate those who want to live here, costs will increase and inhibit further growth.

To achieve the region's job growth potential, the workforce will need to grow sufficiently to provide enough workers to fill the available jobs. Natural growth in the population—the number of births minus the number of deaths—won't be enough to maintain growth in the labor force because fewer younger workers will replace the number of older workers who are retiring. Some of the difference could be made up by drawing more of the region's working-age residents into the workforce, but this will push against a trend of shrinking labor force participation, especially for younger adults and teens. Most new workers will need to be attracted into the region from elsewhere.

To estimate the population needed to support the projected growth of 1.9 million additional jobs, population projections were prepared using a model that projects population by estimating births, deaths and migration by age and gender. Future migration rates were estimated by scaling the actual 1990-2010 migration rates for each five-year age and gender cohort up or down in order to yield a population large enough to provide enough workers to fill the projected number of jobs in the 31-county region. The assumptions included higher rates of employment, as job growth and a tighter labor market reduces unemployment and draws more people into the labor market. A description of the population projections model can be found in Appendix A.

Figure 7: Regional Population by Age, 2010-2040[4]



Source: Regional Plan Association; U.S. Census Bureau Decennial Census 2010; U.S. Census Bureau American Community Survey 2010-2014; U.S. Census Bureau County Population Estimates 2015

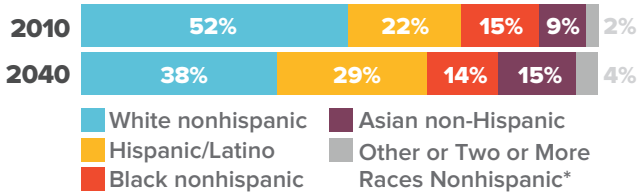
As a result of increases in migration and a changing age structure, total population would grow by 3.7 million people over the estimated 2015 population of 22,280,376, or at an annual rate of 0.6%, nearly identical to the rate of population growth from 1990-2010. Compared with the U.S. census midrange forecast for national population, the region's share of the nation would decline from 7.2% to 7.0%.

4 Values for 2015 were calculated using 2015 Census County Population Estimates for the region's total population, then applying age ratios from the 2010-2014 American Community Survey.

The number of people over age 65 will rise dramatically. Even with increased in-migration from younger adults, the region's population will still become considerably older, with the persons over age 65 increasing from 13% of the population in 2010 to 23% in 2040. All other age groups would increase numerically but decline as a share of the population, particularly those in their late 30s to early 60s.

The region's population also will become more racially and ethnically diverse. Just the natural aging of the population would increase the black, Hispanic and Asian share of the population substantially. If new migration to the region has a similar profile, then the white share of the region's population would decrease from 52% in 2010 to 38% In 2040. Hispanics would increase from 22% to 29% and Asians from 9% to 15%. The African-American share would decline slightly from 15% to 14%.

Figure 8: Tri-State Region Population Potential by Race, 2015-2040



Source: Regional Plan Association; U.S. Census Bureau Decennial Census 2010

Household projections were calculated using headship rates, which measure the likelihood of a person to be a head of a household. Headship rates are very low for teenagers, whereas middle-age adults have headship rates of nearly 50%, meaning that 1 in 2 middle-age adults are heads of a household. Under these assumptions, households would grow by 2,422,000 between 2010 and 2040. The number of persons per household would decline from 2.80 to 2.51, primarily because of the increase in elderly households, which have far more one and two-person households than younger age groups.

Achieving the Region's Economic Potential

How much and how we grow is a choice that the region's residents, businesses and leaders collectively make, whether intentionally or not. Where and how we invest in infrastructure, schools, public spaces and services, how we pay for these investments and how we regulate our businesses, land and environment will help shape how much we prosper and who benefits most. As a large and influential place, actions in the New York region can even have some influence on forces that are mostly out of our control, such as the direction of the national economy, climate change and cultural trends.

Table 1: Tri-State Region Population Potential by Age, 2015-2040

	Total Population			Share of Population		
Age Group	2010	2015	2040	2010	2015	2040
Youth (0-19)	5,682,553	5,603,576	6,021,571	26%	25%	23%
Young Adults (20-34)	4,573,175	4,819,657	4,770,073	21%	21%	18%
Working Age (35-64)	9,034,814	9,179,000	9,700,406	41%	40%	37%
Seniors (65+)	2,923,977	3,248,536	6,078,113	13%	14%	23%
Total Population	22,214,519	22,850,769	26,570,163			

Note: Values for 2015 were calculated using 2015 Census County Population Estimates for the region's total population, then applying age ratios from the 2010-2014 American Community Survey. Sources: Regional Plan Association; U.S. Census Bureau Decennial Census 2010; U.S. Census Bureau County Population Estimates 2015

Table 2: Households by Age, 2015-2040

	Households			Share			Increase 2015-2040	
Age Group	2010	2015	2040	2010	2015	2040	#	%
Younger Adults (15 to 24)	225,563	165,148	228,478	3%	2%	2%	63,516	38%
Young Adults (25 to 34)	1,200,098	1,151,525	1,243,351	15%	14%	12%	92,834	8%
Working Age (35 to 64)	4,899,221	4,906,324	5,285,158	60%	60%	50%	383,120	8%
Seniors (65+)	1,828,543	1,949,268	3,810,443	22%	24%	36%	1,864,265	96%
Region Total	8,153,425	8,172,265	10,567,429	100%	100%	100%	2,403,735	29%

Note: 2015 households were estimated using 2015 County Population Estimates for regional total population, then applying household to population ratios per age group, as calculated from the 2010-2014 American Community Survey. Sources: Regional Plan Association; U.S. Census Bureau Decennial Census 2010; U.S. Census Bureau American Community Survey 2010-2014; U.S. Census Bureau County Population Estimates 2015

Reaching the full job and population growth potential described in this report won't be easy, nor will it automatically result in widely shared benefits. But it does provide a greater chance to expand prosperity and opportunity to a wider number of residents, make the region more affordable and improve quality of life in the following ways:

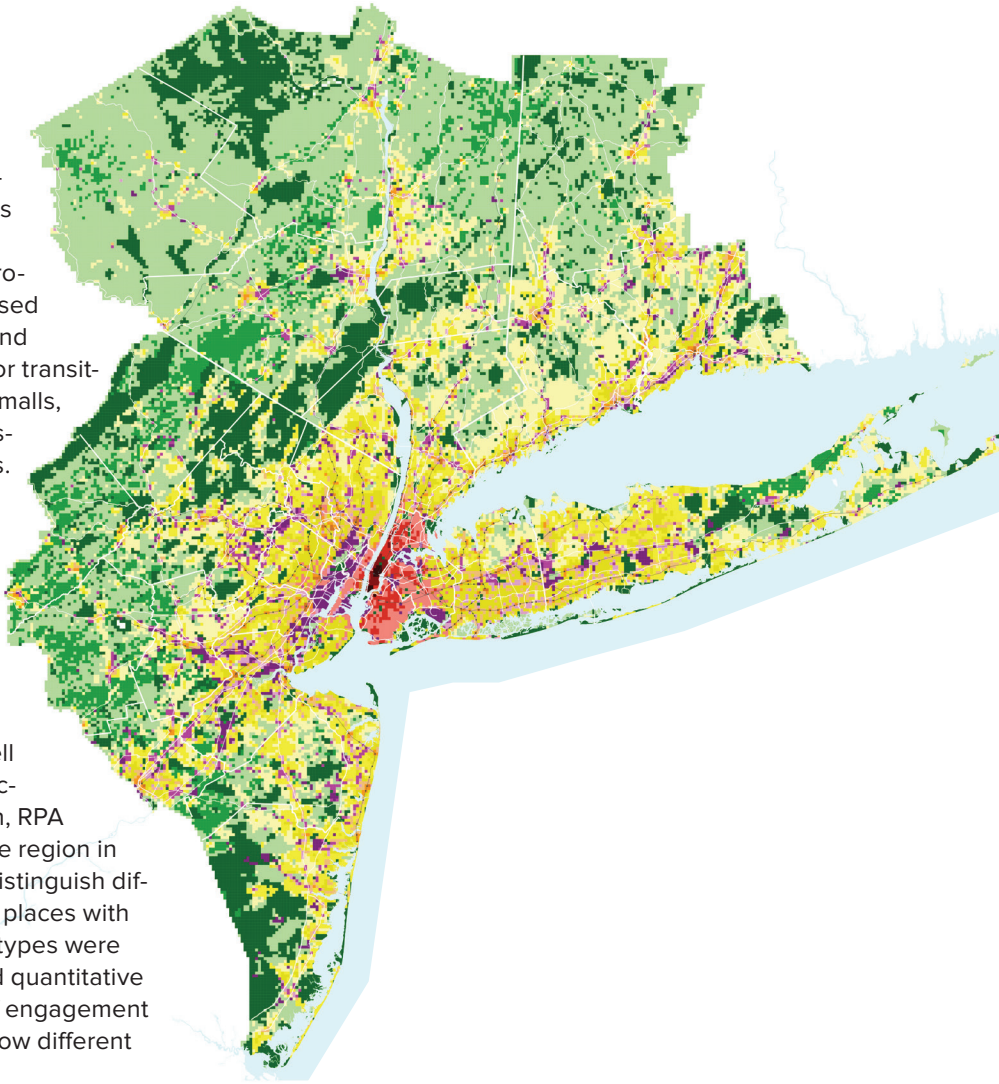
- Over a million more people in the region would be employed if we achieve this higher growth trajectory than if we continue with current trends. This would increase the number of job and career opportunities available to job seekers across a wide range of skills. What the mix of jobs would be, how much average incomes would increase and who would hold these jobs will be determined by a number of factors, including technological change and both national and local employment, education and training policies. But wage increases and upward mobility will be much easier to achieve with more robust economic growth.

- The region would be more affordable if the right type of housing is created and preserved to meet demand. The region's high housing costs are a symptom of supply not keeping up with demand. The region's rate of housing production declined steadily from 147,000 units per year in the 1950s to 55,000 annual units in the 1990s and 64,000 units per year in the 2000s. A 50% increase over the current rate of production, to 90,000 per year, would accommodate demand and house the workforce necessary to attract a larger number of jobs. It would increase vacancy rates to bring down average housing costs and make it easier to cross-subsidize low and moderate-Income units with market-rate housing. Combined with policies to preserve and create below-market units, it would reduce housing cost burdens across all incomes.

- Increased tax revenue could be used to either hold down tax rates or improve public services and amenities. While the need for many public services would increase, others—such as public assistance or health services—would decrease as rising jobs and income help decrease poverty and improve public health. Rising tax revenue could be used to improve aging infrastructure systems, public schools, parks and other necessities without increasing tax rates.

The benefits are substantial, but the challenges to achieving growth in ways that are both equitable and sustainable are daunting. It will require finding the space for more housing and commercial development in places that have the infrastructure and density to support it. It will mean expanding the number of walkable, transit-oriented neighborhoods that are most in demand while allowing current residents to stay and thrive, and expanding affordable housing in places with good schools and job opportunities. Transportation capacity will need to be expanded, and innovative ways to finance transit and improvements in other infrastructure in the face of large funding gaps will be fundamental.

Where Growth Could Go



The room for growth exists. Substantial redevelopment capacity exists around the region's 963 subway, light rail and commuter rail stations. New services, such as connecting Metro-North service to Penn Station or RPA's proposed Triboro Line connecting the Bronx, Queens and Brooklyn would greatly expand the options for transit-oriented development. Outmoded shopping malls, office parks and auto corridors could be transformed into well-designed mixed-use centers. Infill development, accessory dwelling units and redesigned office and industrial space could accommodate more people and jobs in existing neighborhoods and business districts while improving the appearance and functioning of these spaces and local access to employment, retail and services.

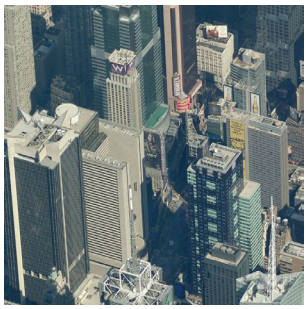
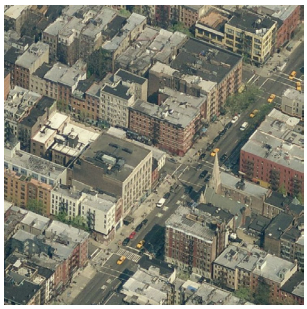
To understand where growth could go, as well as to ground the fourth plan's policies and recommendations in the landscape of the region, RPA developed a series of typologies to define the region in terms of types of places. This helps to both distinguish different types of communities as well as group places with similar characteristics together. These place types were developed through a series of qualitative and quantitative analyses, and through an iterative process of engagement with our stakeholders to better understand how different landscapes could best be grouped together.

To provide a standard unit of analysis, the region was divided into half-mile-squares. After allocating a wide array of physical, land use, economic and demographic data to these units, and analyzing their relationships, five variables were determined to be most relevant for describing a place in terms of its physical characteristics as well as its balance of jobs and residences. These variables were percentage of impervious surface as a proxy for urban development intensity, intersection density as a proxy for the walkability and connectivity of a place, residential and job density to understand the main purpose of a place, and land use entropy, which defines the degree of mixed-use in any given place.[5]

5 For additional information on the methodology and assumptions forthe place typologies, see "Identification and Classification of Urban Development Place Types for the New York Metropolitan Region" http://library.rpa.org/pdf/Montemayor-Calvin-Urban-PlaceType-Paper.pdf

These place types, described below, served as the building blocks of our growth allocations and future scenarios.

URBAN CORE

The **Urban Core** contains the dense and centrally located places in the region, including most of Manhattan, Brooklyn, Queens, and the Bronx and large portions of Hudson and Essex counties in New Jersey. These places are characterized by a very dense environment of compact and connected urban fabric, with the highest density of employment, population, or both.

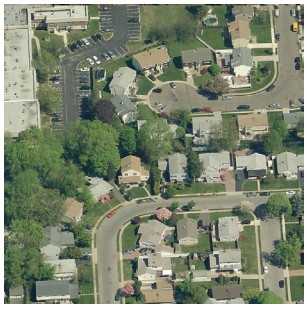
DOWNTOWNS AND LOCAL CENTERS

Downtowns and Local Centers are places that serve both as local employment and commercial hubs and have a great deal of housing either mixed in or surrounding the center. Downtowns and local centers, which can be large urban centers, such as Bridgeport and Paterson, small suburban downtowns, or mixed-use corridors that often serve as central places, tend to have connected and often walkable street networks. These places are highly developed, and depending on the scale, are areas that represent mainly infill and redevelopment opportunities.

COMMERCIAL & INDUSTRIAL

Commercial & Industrial are mainly employment-oriented places, typically with a dominant single use, such as shopping malls, industrial parks, etc. They are usually found outside the region's core, are well-separated from other uses, tend to be heavily paved, feature sprawling buildings, and tend to be accessible only by car. Examples include Westbury shopping center, parts of Route 1 in New Jersey, and JFK Airport.

PRIMARILY RESIDENTIAL



Primarily Residential makes up most of the region's suburbs, with a lower density of development and devoted almost entirely to single family housing. These places range from walkable neighborhoods with highly-connected street networks to isolated cul-de-sac developments.

RURAL & OPEN SPACE

Rural and Open Space makes up the very lowest density places, frequently farm land or protected and unprotected open spaces.

Scenarios for Future Growth

Our ability to achieve our vision of a prosperous, fair and resilient region is as much a function of where and how we grow as it is of how much we grow. Growth could occur in a number of ways: new homes and businesses could continue to be built in low-density suburbs. They could be attracted to small downtowns or to the region's core. Each of these has implications for commuting patterns, access to jobs and schools, vulnerability to climate change, and other outcomes.

To evaluate whether and how we could achieve our goals with this level of growth, we used a series of scenarios to highlight the benefits and trade-offs of different settlement patterns. Each of the scenarios below emphasized a singular objective for the region's development patterns.

Each of these scenarios was constructed to make it as sustainable and transit-oriented as possible within its primary framework. None of these scenarios is inherently better or worse. Depending on one's perspective, each has advantages and disadvantages.

The purpose of the exercise was to evaluate and select the best attributes of each scenario based on specific outcomes. This analysis included some preliminary outcome measures and potential policy implications. The scenarios themselves do not address important elements about the type of development that should occur, such as levels of housing affordability, energy efficiency or walkability, though the scenarios can provide a framework for addressing these issues.

The defining features and implications of each of these scenarios, including a "business-as-usual" scenario that assumes that current trends continue, are described in the following pages. The results of outcome metrics for the scenarios can be found in Appendix B.

Grow with Nature: The region's settlement patterns are organized around natural systems.

Reinforce the Center: Infrastructure and redevelopment create more room for growth in the region's urban core.

Resurgent Downtowns: The largest number of people and jobs gravitate to the region's large, medium and small centers outside of the core.

Reinvent the Suburbs: Suburban centers and corridors are redesigned and retrofitted to make them more socially and environmentally sustainable.

Where Current Trends are Leading

If the trends, land use and infrastructure policies of the last 20 years were to continue, the region would see lower job and economic growth than it has in the past. An aging population, declining labor force participation rates for young adults and the plateauing of women entering the workforce means that there will be fewer workers to fill new jobs even if the population continues to grow. A shrinking supply of easily developable land and a growing amount of infrastructure that is in need of repair and modernization will make it even harder to maintain past levels of housing and commercial construction.

With a similar level of housing and commercial construction and continued patterns of migration, the region would gain only 1.8 million new residents and fewer than 1 million jobs, compared to 3.7 million residents and 1.9 million jobs that the region could potentially attract. With the baby boom generation reaching old age, those over 65 years old will make up nearly a quarter of the population, and the working share of the population would shrink, from 60% today to 40% in 2040. Lower skill jobs are most at risk of being lost due to automation, although occupations at all skill levels to care for an aging population are likely to increase. New York City captures the majority of new jobs, and a larger share of the population as opposition to growth remains strongest in suburban communities.

Defining features

- New housing and commercial space production and levels of investment in infrastructure continue at a similar pace to the last 20 years.
- Demographic changes lead to an aging and more racially and ethnically diverse population.
- A relatively smaller workforce and technological advancements are likely to constrain the growth, or even decrease the number, of low and middle-skill jobs.

Why it might happen

- Inertia and opposition to new development would limit expansion of housing, commercial space and infrastructure capacity.
- Technology could replace labor at an accelerating pace.
- Storms or terrorism could increase more here than elsewhere.
- The region would become more costly, less safe and more stressful relative to other places.

Implications for...

Patterns of growth

- Job growth would be concentrated in the urban core, with population dispersed throughout the region.
- Jobs would grow at less than a third of the pace of the last twenty years, and New York City would capture about half the region's job growth.
- Population would grow at half the pace of 1990-2010, and New York City would capture a third of new residents.
- More than a third of the employment growth would take place in commercial and industrial places where it is easier to develop dense commercial or mixed-use development.

Environmental, economic and equity measures

- A less dynamic economy would offer fewer opportunities for income growth or career advancement.
- Job growth would be limited, primarily in sectors with lower than-average salaries.
- The housing affordability crisis would continue, with limited income growth and fewer units built than the market demands at multiple price levels.
- 600 square miles of open space would be consumed, or the equivalent of 39% of the region's remaining greenfield sites.

Scenario #1: Grow With Nature

Most responsive to climate change and the environment

In this scenario, the priority is to ensure a resilient and sustainable future for the region by organizing regional settlement patterns around natural systems, protecting critical habitat and open space, restricting future development in the flood zone and retreating from the most vulnerable locations. This growth pattern would raise difficult political issues related to restricting development, as well as equity and retreat. It also puts the highest share of growth in already developed places, especially in the urban core, requiring the most additional density and infrastructure capacity in these places.

Defining features

- Prioritize the preservation of critical habitat and open space.
- Significantly accelerate residential growth toward Manhattan and the core.
- Distribute job growth toward downtowns, large and small.

Why it might happen

- Storms and heat waves are increasingly frequent and intense.
- U.S. and states increase support for climate mitigation and adaptation.
- Millennials, baby boomers and immigrants strongly prefer urban and downtown living.
- Support for natural systems becomes central tenet for land use and infrastructure policies.

Implications for...

Patterns of growth

No new growth in environmentally sensitive areas and accelerated growth in the urban core

- There would be almost no new growth in rural and opens space and negative growth in flood zones.
- New York City would gain approximately 2.5 million new residents, compared to 1.2 million over the last 25 years.
- Population growth outside of New York City would grow at a slower rate than in the last decade, gaining 1.6 million people compared to 1.8 million from 1990-2015. New Jersey would be particularly affected.
- Job growth would be concentrated in the urban core, but to a lesser degree than in the last decade.

Environmental, economic and equity measures

Protects most open space and puts fewer people at risk of flooding

- Only 40,000 new residents would move into the flood plain, less than 13% of the more than 300,000 in any of the other three scenarios.
- High share of new population growth would locate to areas susceptible to urban heat island.
- Nine in 10 new residents and eight in 10 new jobs would locate near train stations.
- Only 17,000 acres of open space would be consumed, 2% of the region's remaining unprotected open space, protecting the region's natural systems better than any other scenario.

Policies, projects and other investments

Requires aggressive open space acquisition, managed retreat and urban housing production

- Reform and expand buy-out programs and support for community transition in flood-prone areas.
- Significantly up zone for residential development in urban areas.
- Implement aggressive measures to preserve affordable housing and limit displacement.
- Expand transportation capacity in the high-density areas where very significant growth would occur.
- Invest in other infrastructure to support urban development.
- Aggressively protect open space and restore wetlands
- Maximize limited opportunities for creating affordable housing in high opportunity areas in the suburbs.
- Strengthen rural agriculture and tourism.

Scenario #2 : Reinforce the Center

Best job access and most favorable to large cities

This scenario is predicated on continuing to capture most of the region's job growth in the core and in those larger cities with the strongest public transportation connections to the core. Population growth is distributed throughout the region, much as it has in the recent past. This scenario would require major capital investments and a policy structure to enable major growth in already dense areas, and the most new transportation capacity into and within the urban core. It will also require aggressive policies to limit displacement and expand affordable housing in New York and other large cities in the core.

Defining features

- The core is designed to absorb most of the region's job and population growth.
- Outside the city, job growth takes place in downtowns and residential communities rather than commercial and industrial places.

Why it might happen

- Businesses continue to gravitate toward large cities.
- Living and work space per person shrinks and technology allows more transportation throughput.
- Millennials, immigrants and their children live in both cities and suburbs, but use transit far more.
- New York City is able to substantially increase both employment and housing density.

Implications for...

Patterns of growth

New residents and jobs would be highly concentrated in the core, and also in transit-accessible locations

- Population in the core would grow by more than 2 million, capturing more than twice the share of population growth of the last decade.
- Job growth in New York City would be the strongest of the four scenarios, but it would also grow in other parts of the region after flat job growth in the last decade.
- Downtowns close to the core would capture a significant share of job and population growth, but poorer cities and those farther from Manhattan would not.

Environmental, economic and equity measures

A large share of the residential growth would be taking place in places that are vulnerable to flooding and urban heat island.

- 325,000 more people would live in the flood zone, and more than 2.8 million more in areas susceptible to urban heat island effect.
- Nearly 9 in 10 new residents and jobs would be accessible by transit.

Policies, projects and other investments

Would require the biggest transportation investments and congestion management into the urban core

- Significantly expand transit investments both into and, especially, within the urban core.
- Preserve and cross-subsidize affordable housing with market rate housing in urban areas.
- Emphasize mixed-income TOD in suburban centers.
- Leverage suburban economic development with growth in commuter incomes.
- Most likely scenario for surge barriers and other storm resistance.
- Emphasize complete street design and pedestrian comfort/access in the congested core.

Scenario #3: Resurgent Downtowns

Most favorable to distressed cities and jobs-housing balance

In this scenario, population and job growth mainly takes place in the region's large, medium and small centers to foster vibrant downtowns for living, working and playing. Ambitious governance and investment strategies will be required to break the cycle of poverty and disinvestment in by-passed cities, and to create sustainable infill development in smaller downtowns and mixed-use corridors.

Defining features

- Growth is directed to transit-accessible downtowns, many of which are currently struggling economically.
- Build suburban economy around existing and new mixed-use centers.

Why it might happen

- Strong demand for walkable, mixed-use centers combines with growth constraints in the urban core.
- Live-work preferences and communications technology favor network of sub-centers.
- National and state policies shift toward urban reinvestment.
- "Cycle of success", including improvements in governance, safety, education and neighborhoods, occurs in increasing number of cities.

Implications for...

Patterns of growth

Cities like Newark, Bridgeport, and Newburgh become thriving mixed-income centers.

- Downtowns across the region would absorb well over a third of new employment, with Northern New Jersey capturing much of that growth.
- Downtowns would also capture more than a third of the region's new residents, diverting growth away from residential suburban areas.
- The urban core would still capture 50% more of the residential growth than in recent years.

Environmental, economic and equity measures

Residents of struggling urban communities would gain access to more jobs, both nearby and in New York City.

- One in seven new jobs would be created in high-poverty, primarily non-white areas – places that desperately need access to jobs.
- More than 80% of new jobs would also be created within short distance of the rail network, greatly increasing access to good jobs throughout the region.

Policies, projects and other investments

Requires multi-faceted urban strategy and investments to reverse trends

- Transform and greatly expand the brownfield reclamation process.
- Enact state incentives for municipalities to promote multifamily housing construction.
- Reform property taxes to promote urban development and equitable school funding.
- Leverage market rate development for affordable housing and neighborhood improvements.
- Invest in reverse commutation and multi-modal transportation hubs.
- Transform the commuter rail network into an urban rail System.
- Enact tighter restrictions on greenfield development.

Scenario #4: Reinvent the Suburbs

Retrofits sprawl and rejuvenates suburban economies

This scenario focuses on stitching together and retrofitting the region's dispersed suburbs while accommodating future growth in medium and low density areas throughout the region. This would require investing in water, sewerage, roads, transit and other infrastructure to accommodate more growth in smaller places. It provides the greatest opportunity for allowing more low-income households and persons of color to move to places with good schools and other opportunities, but only with policies that support mixed-income communities and expanded mobility.

Defining features

- Continue trends for residential growth in suburban and rural areas.
- Reinvigorate suburban communities with more employment.
- Retrofit underperforming sprawl and post-industrial spaces.

Why it might happen

- Millennials, baby boomers and immigrants want to stay in or return to suburbs.
- Technology reduces road congestion and increases on-demand Transit.
- National and state policies reduce barriers to financing and constructing transit-oriented, mixed-use downtowns.

Implications for...

Patterns of growth

Job growth would shift away from the urban core and to the suburbs; residential growth patterns would continue apace.

- Suburban centers and corridors would capture nearly a third of all new employment, when they lost employment in recent years.
- Northern New Jersey and Long Island, but also the Hudson Valley and Connecticut, would capture hundreds of thousands of jobs that otherwise could have gone to New York City.
- Residential growth continues apace across all suburban and rural areas.

Environmental, economic and equity measures

Best opportunity for more to live in walkable neighborhoods with good schools and amenities, but significant loss of open space and exposure to flooding

- 140,000 acres of open space would be consumed – 1 in 7 remaining acres of unprotected open space.
- Nearly 3 in 10 new residents would be moving into high-performing school districts – much higher than the other three scenarios.
- Relatively fewer new residents and jobs would be locating near train stations, creating a stronger need for other forms of transit.
- Travel between suburban communities would increase by 1.2 million trips a day, a much more significant increase than in any other scenario.

Policies, projects and other investments

Requires dramatic changes in intra-suburban use and mobility; opportunity to improve disconnected suburban communities

- Adopt pricing strategies to manage traffic on the highway network.
- Transform suburban mobility with better bus service, on-demand services, and car/bike sharing.
- Improve the road network in key locations.
- Focus on state of good repair and modernization for urban transportation systems.
- Create a region-wide electric-vehicle infrastructure network.
- Reform SEQRA and equivalent project approval processes to accelerate the construction of housing in suburban communities.
- Redesign office parks, shopping malls and commercial corridors for mixed-use development.
- Greatly expand accessory dwelling units to meet affordable housing needs.
- Expand housing vouchers and fair housing protections to encourage social and economic mobility.
- Redesign park and open space networks to connect dispersed communities.

An Aspirational Vision for 2040

By assessing the outcome metrics of the alternative scenarios, and evaluating growth capacity in different parts of the region, RPA developed an aspirational vision for the region in 2040. The scenario is not a prediction of what is most likely to happen. Rather, it represents an outcome that would best support a vision that would equitably expand the region's prosperity with more environmentally sustainable patterns of development.

Specifically, decisions about the best locations for new jobs and housing were predicated on how well they achieve and balance outcomes that will lead to a better region:

- **Expanding prosperity and opportunity** by reinforcing concentrations of jobs and mixed-use development around the region's transit network, improving access to jobs and labor, creating more jobs in low-income cities and neighborhoods, and reducing economic and racial segregation by expanding mixed-income housing in high-income communities.

- **Improving affordability** by building more housing where the demand is greatest and vacancy rates are low to relieve pressure on housing prices, creating more multi-family homes that can support smaller and lower cost housing units, putting housing and jobs in closer proximity to reduce commuting time and costs, and making efficient use of existing infrastructure.

- **Fostering a healthier and more livable region** by reinforcing mixed-use, walkable communities that encourage physical activity and have greater access to fresh food, education and other needs, encouraging transit and reducing auto use to both reduce air pollution and encourage walking, reducing high concentrations of poverty, and improving access to nature.

- **Creating a more resilient region** by supporting denser settlement patterns that reduce greenhouse gas emissions, limiting growth in flood-prone and environmentally sensitive areas, and reducing development of open space that both cools the region and helps absorb and recover from storms and flooding.

The process required balancing different objectives and resolving trade-offs when allocations of population and jobs improved some desired outcomes but worsened others. For example, some of the most advantageous locations for housing or commercial development from the perspective of transit-oriented development or access to jobs and opportunity are in areas that are vulnerable to increasing storms and flooding. These were resolved in part by giving weights to how much a place scored on transit, job access, climate vulnerability and other factors, but also by prohibiting growth in places that would be most severely impacted by sea level rise.

Existing trends and the capacity of different types of places were taken into account to match the desirability of growth with its feasibility. Densities, land uses and infrastructure were considered, but results were not constrained by existing zoning or political context. By design, the scenario attempted to project population and jobs that could be sustainably accommodated with ambitious infrastructure investments and policy changes.

As described in Appendix C, the allocation model consisted of three iterative components: 1) initial allocations for the 16 place types within five major geographic areas—New York City, Northern New Jersey, Long Island, the Hudson Valley and Southwestern Connecticut, 2) assigning growth factors that weighted each of 50,000 half-mile X half-mile grid cells by certain characteristics, and 3) adjusting population and jobs for 131 downtowns, corridors, commercial hubs, and other specific places with particular growth potential. Some final adjustments were made after converting population to households and analyzing how many housing units would be added to place types and specific places.

Jobs in 2040

In this vision scenario, robust economic growth would result in jobs growing at the rate 0.6% per year, or by a total of 16% over the forecast period. Three-fourths of new jobs would either be in the urban core or in downtowns and centers outside of the core. Many of the industries that are expected to grow the most are already concentrated in these place types, and in recent decades the urban core in particular has captured the lion's share of the region's job growth.

Office industries would account for more than half the new jobs, and it is expected that high-value activities would continue to grow at the expense of more routine functions, especially in Manhattan and other high-cost office districts. Finance is likely to represent a smaller share of employment as technology and professional services expand. The nature of office work is changing, with workers spending more time working from remote locations and in teams that span multiple locations and time zones. But collaboration, physical proximity and access to a large, talented workforce will remain critical, favoring central locations in the central business district and other transit-accessible commercial centers.

Health and education is the fastest growing sector, with the largest growth from health services ranging from home health care to highly specialized technology. Large portions of this sector serve local populations, and would be distributed similarly to population. However, universities, research centers and major hospitals are more likely to be more centrally located to serve regional or even international customers.

Retail and service jobs are expected to grow only modestly, in large measure because many jobs are subject to automation. As with health and education, much of this sector is locally-serving. The forecast assumes that investments in mixed-use, transit-oriented development will attract more of these jobs to downtowns of all sizes, as well as well-positioned corridors designed for foot traffic and transit as well as auto use.

Industrial jobs, which include construction, utilities, transportation and distribution as well as manufacturing, remain stable in the vision scenario as the result of land use, business support and workforce development policies that protect healthy industrial areas and activities. Most will remain in existing industrial areas, but activities that are compatible with commercial and other uses will grow in some mixed-use areas.

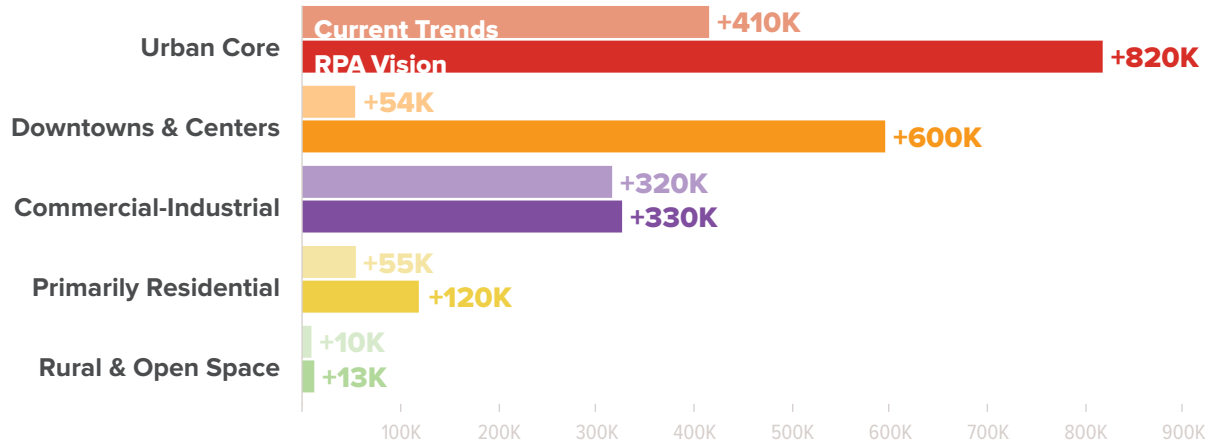
Job growth by type of place

The forecast assumes that compact, high-income cities like New York will continue to attract high-value activities, and that the city and region makes the investments in its commercial space, transportation, housing and workforce to remain competitive. Expanding jobs in the urban core also makes efficient use of the existing transit network, helps to reduce driving, and puts more jobs within a feasible commute of the large share of the region's unemployed and low-income job seekers that live in the urban core. Jobs in the urban core would grow twice as much in this forecast than in the scenario that assumes that current trends continue, but the share of job growth is similar under both scenarios. The Manhattan central business district would grow by 16%, the same as the region as a whole, but other parts of the core in New York City's other boroughs and northern New Jersey would grow at a faster rate.

The biggest change from current trends is that jobs in downtowns and centers are projected to grow by 26%, more than the 19% growth in the urban core and much more than the 2% that assumes a continuation of current trends. While less than the growth projected in the Resurgent Downtowns scenario, it nevertheless assumes much more far-reaching and effective urban economic policies from all levels of government—federal, state, county and municipal. There is more than enough redevelopment and transportation capacity in these places to support this level of job growth, and the economic and equity benefits would be substantial. It would create multiple job centers that could make the region more competitive, create economic opportunity in some of the most impoverished parts of the region, and improve the tax base of municipalities that both rely heavily on state assistance and have some of the highest property tax rates in the region. There are numerous examples of thriving downtowns in the U.S. and in the region, from large downtowns like Stamford CT to smaller town and village centers. The largest transformations will need to take place in poorer cities and suburban centers like Bridgeport or Paterson with entrenched cycles of disinvestment.

Job growth would be slower in the less dense and more dispersed parts of the region. Commercial and industrial areas, which have been some of the fastest growing areas outside of the urban core, would grow by 13%, slightly less than for the region as a whole. Job growth would be slowest in primarily residential and rural areas. Jobs declined in these types of places in the last decade. The intent within this aspirational forecast is to limit job growth in residential areas to neighborhood service jobs, while expanding nearby job opportunities in mixed-use downtowns, village centers and corridors. The exception is in agricultural areas, where jobs grow by 14%, and the goal is to support agricultural economies that can help main-

Figure 9: Job Growth by place typology, Current Trends and RPA Vision



Source: Regional Plan Association; Moody's Analytics

Table 3: Job Allocations by Place Typology, Current Trends and RPA Vision

		Current Trends 2040			RPA Vision 2040		
Typologies	2015 Total Jobs	Total Jobs	Growth	% Growth	Total Jobs	Growth	% Growth
Urban Core	4,355,896	4,772,168	416,272	10%	5,174,580	818,683	19%
01 Central Business Districts	1,961,655	2,155,388	193,732	10%	2,275,873	314,218	16%
02 Manhattan Mix	730,973	803,256	72,284	10%	845,561	114,589	16%
03 Very High Density Mixed	740,623	810,918	70,295	9%	920,719	180,096	24%
04 High Density Mixed	922,646	1,002,606	79,960	9%	1,132,426	209,780	23%
Downtowns and Centers	2,264,788	2,319,099	54,311	2%	2,861,119	596,331	26%
05 Regional Centers	668,066	684,748	16,682	2%	924,757	256,691	38%
06 Local Downtowns	523,301	535,875	12,574	2%	665,096	141,795	27%
07 Commercial Corridor	1,073,421	1,098,475	25,054	2%	1,271,266	197,845	18%
Commercial-Industrial	2,527,601	2,844,707	317,107	13%	2,854,874	327,274	13%
08 Industrial, Utility, Transport	801,894	917,225	115,331	14%	922,463	120,569	15%
09 Commercial	1,032,082	1,152,336	120,254	12%	1,173,430	141,348	14%
10 Seperated Multiple Use	693,624	775,146	81,521	12%	758,982	65,357	9%
Primarily Residential	2,068,918	2,123,920	55,002	3%	2,188,364	119,446	6%
11 Medium Density Residential	786,258	811,912	25,655	3%	844,024	57,766	7%
12 Moderate Density Residential	810,744	829,927	19,183	2%	851,228	40,484	5%
13 Low Density Residential	471,917	482,081	10,164	2%	493,112	21,195	4%
Rural and Open Space	400,555	410,188	9,633	2%	413,080	12,525	3%
14 Very Low Density and Open Space	250,405	257,141	6,736	3%	255,725	5,321	2%
15 Agrictulture	52,571	53,876	1,305	2%	59,765	7,194	14%
16 Protected Open Space	97,579	99,171	1,592	2%	97,589	10	0%
Region Total	11,617,758	12,470,082	852,324	7%	13,492,017	1,874,259	16%

Source: Regional Plan Association; Moody's Analytics

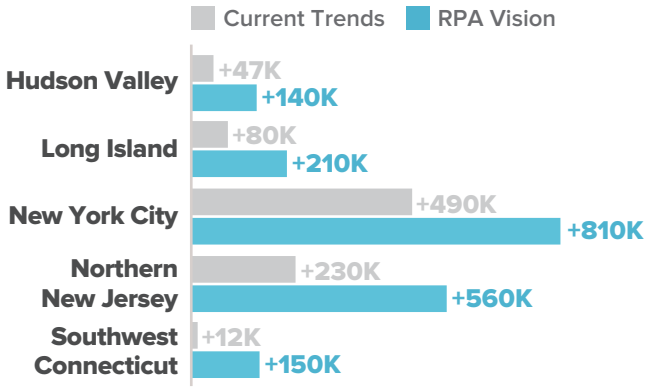
tain productive uses that protect open space and provide income in some of the more impoverished parts of the region.

Job growth by geographic area

All of the five major geographic areas of the region would see substantial growth. New York City would growth slightly faster than other parts of the region—by 18% compared to 14% on Long Island and in the Hudson Valley, 15% in southwestern Connecticut and 16% in northern New Jersey. This is a departure from the last decade, when New York City captured most of the region's net new jobs. But it is also substantially different from most of the last half of the 20th century when the suburbs far outpaced New York City.

Having more jobs in the region's core where most of the region's workforce can commute via transit is one of the region's great strengths that should be reinforced, but the recent imbalance in city-suburb growth is both unsustainable and undesirable. Job growth that is more geographically balanced will help local economies be less susceptible to swings in either the job or housing markets, provide more job opportunities closer to where people live and put less strain on some of the most overburdened parts of the transit network. Some convergence of growth rates between New York City and other parts of the region is likely if real estate and other costs in the city continue to rise, but achieving the robust job growth envisioned for New Jersey, Connecticut, Long Island and the Hudson Valley will require greater investment in downtowns and transit-oriented centers and corridors.

Figure 10: Job Growth by subregion, Current Trends and RPA Vision



Source: Regional Plan Association; Moody's Analytics

In the vision scenario, New York City would add 800,000 jobs, growing by 18% (0.7% per year) compared with 11% based on current trends. Manhattan grows by 15%, but the Bronx, Brooklyn and Queens grow by more than 20%. This continues the trend of jobs growing faster in the outer boroughs, and takes advantage of the capacity for office, retail, health and industrial jobs in places like Jamaica, the Bronx hub, Long Island City, Downtown Brooklyn and the airports.

Northern New Jersey grows by more than 500,000 jobs, or 16% (0.6% per year) compared with just 0.2% under existing trends. This assumes that New Jersey's cities, from Jersey City, Newark and Elizabeth to Paterson, New Brunswick and Trenton, become the new economic engines of the state, supporting diversified industries as the auto-oriented office parks and corridors that supported New Jersey's earlier growth are retrofitted for mixed-use development. Hudson, Essex, Passaic and Union all grow by 20% or more, with the lowest rates of growth in Sussex, Hunterdon and Ocean counties.

Long Island would add over 200,000 jobs, growing by 16% (0.5% per year), or twice the number of jobs anticipated with current trends. Nassau's job base would grow by 17%, benefitting from both it's proximity to New York City and the number of existing and potential job centers served by transit, such as Mineola and Hicksville. Jobs in Suffolk County would expand by 12%, both in new hubs such as Ronkonkoma-MacArthur Airport and along remade corridors such as Rte. 110 in the west and Nichols Road farther east.

In the Hudson Valley, the 145,000 jobs and 0.5% annual. growth rate predicted in the vision scenario are more than twice what is anticipated under current trends. Urban centers, from southern Westchester cities such as Yonkers, Mt. Vernon and New Rochelle, to mid-Hudson cities like Poughkeepsie and Newburg, would anchor local economies. Westchester, Orange and Dutchess counties would see the most rapid growth, with Putnam and Sullivan growing most slowly.

Southwestern Connecticut would grow by 150,000 jobs, or 15% (0.6% per year), about five times the rate predicted with current trends. In particular, the larger cities of Bridgeport and New Haven would join Stamford as growing job centers along the New Haven Line/I-95 corridor. Both Fairfield and New Haven counties would grow by 15-16%, while Litchfield would grow at about half that rate.

Population in 2040

Population would grow by the same rate as jobs—16%, or 0.6% per year—in the vision scenario. Both the dense urban core in New York City and northern New Jersey and suburban residential neighborhoods would grow at similar rates, and each would capture about a third of population growth. Downtowns outside of the core would grow most rapidly, and capture about a quarter of the region's new

Table 4: Job Allocations by Subregion, Current Trends and RPA Vision

		Current Trends 2040			RPA Vision 2040		
Subregion	2015 Total Jobs	Total Jobs	Growth	% Growth	Total Jobs	Growth	% Growth
Hudson Valley	1,043,877	1,090,478	46,601	4%	1,186,223	142,346	14%
Long Island	1,449,092	1,528,978	79,885	6%	1,658,406	209,314	14%
New York City	4,555,037	5,040,333	485,297	11%	5,366,912	811,875	18%
Northern New Jersey	3,583,817	3,812,100	228,283	6%	4,145,933	562,116	16%
Southwest Connecticut	985,934	998,192	12,258	1%	1,134,543	148,608	15%
Region Total	11,617,758	12,470,082	852,324	7%	13,492,017	1,874,259	16%

Source: Regional Plan Association; Moody's Analytics

Table 5: Job allocations by county, Current Trends and RPA Vision

		Current Trends 2040			RPA Vision 2040		
County	2015 Total Jobs	Total Jobs	Growth	% Growth	Total Jobs	Growth	% Growth
Hudson Valley	1,043,877	1,090,478	46,601	4%	1,186,223	142,346	14%
Dutchess	129,240	133,917	4,676	4%	146,375	17,135	13%
Orange	155,384	167,061	11,677	8%	178,316	22,933	15%
Putnam	29,288	29,747	460	2%	30,545	1,258	4%
Rockland	140,850	149,700	8,850	6%	156,938	16,088	11%
Sullivan	31,389	29,674	-1,715	-5%	32,596	1,208	4%
Ulster	68,691	68,044	-647	-1%	74,409	5,718	8%
Westchester	489,036	512,857	23,820	5%	567,545	78,509	16%
Long Island	1,449,092	1,528,978	79,885	6%	1,658,406	209,314	14%
Nassau	705,859	741,726	35,867	5%	828,253	122,394	17%
Suffolk	743,233	787,276	44,042	6%	829,991	86,758	12%
New York City	4,555,037	5,040,333	485,297	11%	5,366,912	811,875	18%
Bronx	289,402	323,794	34,392	12%	357,264	67,862	23%
Kings	641,382	698,951	57,568	9%	798,028	156,645	24%
New York	2,875,494	3,191,202	315,708	11%	3,316,286	440,792	15%
Queens	635,878	702,289	66,411	10%	770,265	134,386	21%
Richmond	112,879	124,393	11,513	10%	123,507	10,627	9%
Northern New Jersey	3,583,817	3,812,100	228,283	6%	4,145,933	562,116	16%
Bergen	517,799	542,577	24,778	5%	593,119	75,320	15%
Essex	401,025	435,716	34,691	9%	489,436	88,411	22%
Hudson	284,336	304,523	20,187	7%	356,574	72,238	25%
Hunterdon	56,422	56,969	547	1%	61,421	4,998	9%
Mercer	286,219	308,780	22,561	8%	324,040	37,821	13%
Middlesex	466,041	514,086	48,045	10%	534,313	68,272	15%
Monmouth	288,875	298,837	9,962	3%	319,146	30,271	10%
Morris	335,197	358,221	23,024	7%	374,856	39,659	12%
Ocean	183,224	186,552	3,328	2%	199,188	15,965	9%
Passaic	200,350	210,052	9,702	5%	239,484	39,134	20%
Somerset	211,166	222,409	11,243	5%	237,891	26,725	13%
Sussex	44,535	42,868	-1,667	-4%	47,482	2,947	7%
Union	269,156	292,317	23,162	9%	327,974	58,819	22%
Warren	39,472	40,426	954	2%	43,586	4,114	10%
Southwest Connecticut	985,934	998,192	12,258	1%	1,134,543	148,608	15%
Fairfield	490,583	490,162	-421	0%	569,813	79,230	16%
Litchfield	71,170	66,389	-4,781	-7%	77,161	5,990	8%
New Haven	424,181	442,530	18,349	4%	487,844	63,663	15%
Total	11,617,758	12,470,082	852,324	7%	13,492,017	1,874,259	16%

Source: Regional Plan Association; Moody's Analytics

residents. Some commercial and industrial areas would see substantial growth from mixed-use development, but there would be very little population growth in rural and very low density places.

Three major demographic groups will drive where the region's future population will choose to live—the elderly, millennials and immigrants. Persons over 65 account for more than three-fourths of population growth. Many will continue to move out of the region to warmer and less expensive locations, but a majority will either choose to remain or lack the resources to leave. The vision scenario assumes that the region provides the type of housing and communities to serve this large and diverse group, especially the smaller, multi-family dwellings in walkable communities for those wanting or needing to downsize.

The large millennial generation has thus far moved to cities more than their parents. Many will choose to remain in urban neighborhoods, but the forecast assumes that a large proportion will choose to return to suburban living as they age. However, based on multiple national surveys, they are likely to seek places where there is less need to drive and more access to city or downtown amenities. The scenario depends on the region creating the enough housing in urban, downtown and suburban communities that provide these assets.

Immigrants have been growing in both urban and suburban communities, and their diverse cultural and economic characteristics make it difficult to predict their living choices. The forecast assumes that immigrants and their children will continue to make diverse choices, continuing to increase their share of the population in suburban areas but remaining a major contributor to urban population growth.

Population growth by type of place

The challenge in the region's urban core, where demand is intense and land is scarce, is to expand housing supply while improving affordability and quality of life at a neighborhood scale. By building on remaining large development sites, increasing density around transit nodes, creating new transit services, and implementing infill development that is consistent with neighborhood context, the RPA vision projects a 15% increase in population in the urban core, about the same as for the region as a whole. Neighborhood affordability and quality of life would be maintained through strong measures to preserve existing affordable, expand tenant protections, expand the number of low and moderate income units and invest in schools, parks and streets.

Regional centers and downtowns outside of the region's core can absorb substantially more housing and population. Many of these are older cities or downtowns that are well below their peak population, and have the infrastructure, building stock and land to add substantially to the housing stock. This would also create mixed-use environments that would add to the vibrancy and attractiveness of business districts, and combined with inclusionary zoning would support mixed income neighborhoods and expand housing choices for existing residents. It will also bring many closer to transit and jobs either in the downtown or in urban core, RPA's vision projects a 35% growth in population for these centers as a whole, with the largest increases in bigger cities such as New Haven, Bridgeport, Newark, Jersey City, Yonkers and White Plains.

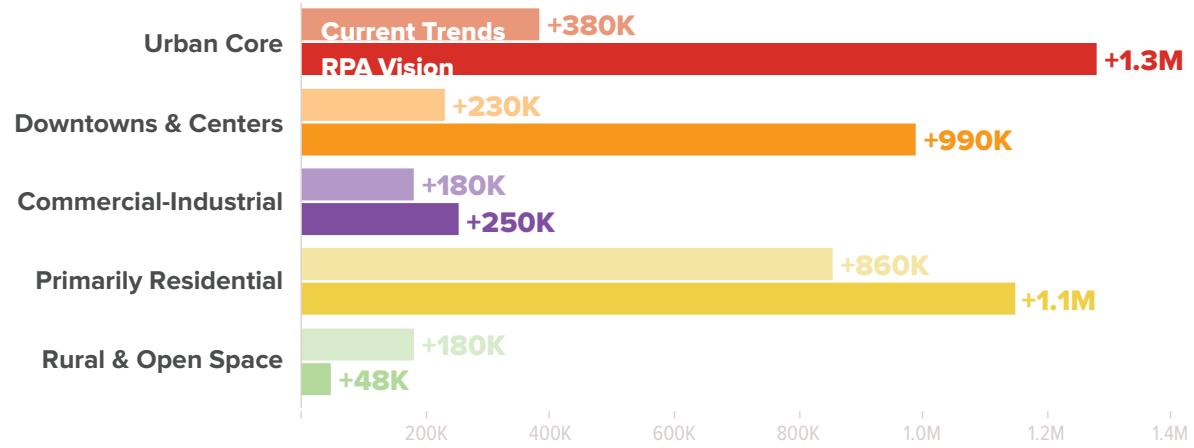
Places that are primarily residential, mostly low-to-medium density neighborhoods covering most of the suburbs but also much of Staten Island and eastern Queens, grow by 13%. This is considerably slower than in recent decades, and can be achieved through expansion in the number of two-family homes, accessory dwelling units and garden apartments near downtowns and transit. These would especially benefit the growing elderly population, both those who wish to remain close to family and those who own their homes but need additional income to maintain them.

Open space protection and land use policies would result in very little new housing development in rural and low-density areas and on remaining undeveloped land. Population in these areas would grow by a total of 5%, or less than 0.2% per year, much less than in any period since World War II.

Population by geographic area

The current trends scenario projects that New York City's rate of growth would decline from the 0.6% per year recorded from 1990 to 2015 to 0.2% annually. over the next 25 years. The slowing growth rate is the result of both demographic change and constraints on the city's housing supply. In the RPA vision, New York City's population would grow by 14% (0.5% per year), slightly less than growth in other parts of the region. The increase in housing production could come from some combination of the following actions, most of which would require city-state collaboration—building over rail yards and rights-of-ways, such as the Sunnyside Yards in western Queens; developing higher density mixed-income housing around existing subway and commuter rail stations; extending the transit network to underserved areas that would be able to support additional housing; increasing building heights allowed in existing high-density areas; encourag-

Figure 11: Population Growth by place typology, Current Trends and RPA Vision



Source: Regional Plan Association; U.S. Census Bureau County Population Estimates 2015

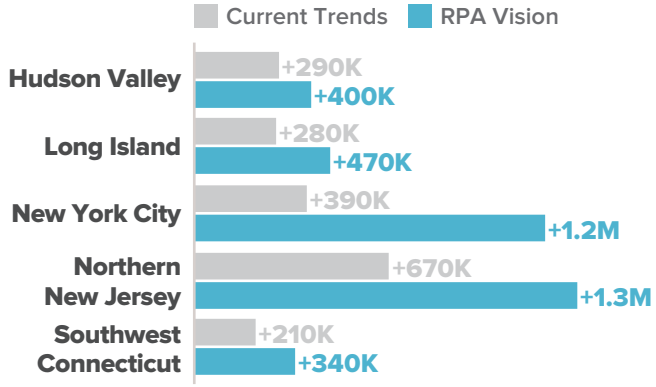
Table 6: Population allocations by place typology, Current Trends and RPA Vision

		Current Trends 2040			RPA Vision 2040		
Typologies	2015 Total Population	Total Population	Growth	% Growth	Total Population	Growth	% Growth
Urban Core	8,472,866	8,856,124	383,257	5%	9,753,027	1,280,160	15%
01 Central Business Districts	212,277	272,743	60,466	28%	247,104	34,827	16%
02 Manhattan Mix	898,858	941,917	43,059	5%	1,020,355	121,497	14%
03 Very High Density Mixed	3,280,643	3,363,355	82,712	3%	3,771,362	490,719	15%
04 High Density Mixed	4,081,088	4,278,108	197,020	5%	4,714,205	633,117	16%
Downtowns and Centers	2,850,663	3,081,773	231,110	8%	3,839,629	988,966	35%
05 Regional Centers	300,732	359,513	58,782	20%	522,973	222,241	74%
06 Local Downtowns	731,527	770,369	38,842	5%	942,687	211,159	29%
07 Commercial Corridor	1,818,404	1,951,890	133,487	7%	2,373,969	555,566	31%
Commercial-Industrial	1,313,385	1,494,524	181,139	14%	1,566,780	253,395	19%
08 Industrial, Utility, Transport	230,968	270,766	39,799	17%	285,201	54,234	23%
09 Commercial	220,872	244,735	23,862	11%	270,720	49,847	23%
10 Seperated Multiple Use	861,545	979,023	117,478	14%	1,010,859	149,314	17%
Primarily Residential	9,193,701	10,048,984	855,283	9%	10,342,928	1,149,227	13%
11 Medium Density Residential	4,653,411	4,934,415	281,004	6%	5,224,455	571,045	12%
12 Moderate Density Residential	3,026,183	3,347,964	321,781	11%	3,440,380	414,197	14%
13 Low Density Residential	1,514,107	1,766,605	252,497	17%	1,678,092	163,985	11%
Rural and Open Space	1,020,153	1,201,694	181,541	18%	1,067,800	47,646	5%
14 Very Low Density and Open Space	592,162	750,638	158,476	27%	622,855	30,693	5%
15 Agrictulture	151,431	174,160	22,729	15%	168,919	17,488	12%
16 Protected Open Space	276,560	276,896	336	0%	276,026	-534	0%
Region Total	22,850,769	24,683,099	1,832,330	8%	26,570,163	3,719,394	16%

Source: Regional Plan Association; U.S. Census Bureau County Population Estimates 2015

ing smaller units; allowing more legal accessory dwelling units; and allowing small multi-family buildings in areas currently zoned for single-family housing.

Figure 12: Population Growth by Subregion, Current Trends and RPA Vision



Source: Regional Plan Association; U.S. Census Bureau County Population Estimates 2015

Northern New Jersey would increase by 18% in the RPA vision, or a rate of 0.7% per year compared to 0.4% projected with current trends. The low-density sprawl that fueled much the state's post war population growth would be replaced by revived growth in its urban centers, around stations along New Jersey Transit lines, and along commercial corridors retrofitted for mixed-use development. Several cities and train stations have already seen significant growth spurred by transit improvements, transit-oriented development programs, and state laws mandating the construction of affordable housing. Other downtowns and cities have potential for similar growth. Counties would grow within a range of 11% in Sussex County to 24% in Hudson County.

Long Island's population would grow by 16%, or an annual rate of 0.6% compared to a rate of 0.4% expected with current trends. Instead of the continued expansion of single-family homes on eastern Long Island, new housing would shift to downtowns and transit corridors, mostly in Nassau and western Suffolk. Many downtowns are already experiencing an increase in multi-family development, and new transit investments, including LIRR's East Side Access and a third track on its Main Line, could support additional downtown development. Nassau County, with a larger number of village centers and transit hubs, would grow slightly more than Suffolk County.

The Hudson Valley would grow only slightly more in the vision scenario than under current trends, 17% versus 12%. However, as in other locations, the type and location of growth would shift substantially. Open space protection would limit the rapid growth currently occurring in rural and undeveloped areas, especially in Orange, Dutchess and Ulster counties. Both small town centers in the Catskills and mid-Hudson and larger cities in southern Westchester and along the Hudson River would experience the greatest amount of new housing and population growth. Westchester and Rockland counties would grow faster than other counties, followed by Orange and Dutchess.

Southwestern Connecticut, which has been one of the slowest growing parts of the region, would grow by 17% (0.6% per year), a rate similar to other areas outside of New York City. Renewed economic growth along the New Haven Line corridor would attract new residents, and zoning, parking and other actions in towns along transit corridors enable more mixed-income housing. Bridgeport, New Haven, Norwalk and Stamford would all grow past their previous historic peaks. Fairfield and New Haven counties would grow by 18%, with Litchfield growing by 11%.

Table 7: Population Allocations by Subregion, Current Trends and RPA Vision

		Current Trends 2040			RPA Vision 2040		
Subregion	2015 Total Population	Total Population	Growth	% Growth	Total Population	Growth	% Growth
Hudson Valley	2,329,896	2,619,017	289,121	12%	2,731,068	401,172	17%
Long Island	2,862,937	3,144,685	281,748	10%	3,329,503	466,566	16%
New York City	8,550,405	8,935,582	385,177	5%	9,749,753	1,199,348	14%
Northern New Jersey	7,116,405	7,782,888	666,483	9%	8,425,830	1,309,425	18%
Southwest Connecticut	1,991,126	2,200,900	209,774	11%	2,334,010	342,884	17%
Region Total	**22,850,769**	**24,683,073**	**1,832,304**	**8%**	**26,570,163**	**3,719,394**	**16%**

Source: Regional Plan Association; U.S. Census Bureau County Population Estimates

Table 8: Population allocations by county, Current Trend and RPA Vision

		Current Trends			RPA Vision		
County	2015 Total Population	Total Population	Growth	% Growth	Total Population	Growth	% Growth
Hudson Valley	2,329,896	2,619,017	289,121	12%	2,731,068	401,172	17%
Dutchess	295,754	336,533	40,779	14%	335,964	40,210	14%
Orange	377,647	427,416	49,769	13%	433,649	56,002	15%
Putnam	99,042	116,521	17,479	18%	109,796	10,754	11%
Rockland	326,037	359,976	33,939	10%	384,021	57,984	18%
Sullivan	74,877	86,421	11,544	15%	79,574	4,697	6%
Ulster	180,143	206,114	25,971	14%	198,109	17,966	10%
Westchester	976,396	1,086,031	109,635	11%	1,189,981	213,585	22%
Long Island	2,862,937	3,144,685	281,748	10%	3,329,503	466,566	16%
Nassau	1,361,350	1,480,442	119,092	9%	1,599,616	238,266	18%
Suffolk	1,501,587	1,664,242	162,655	11%	1,729,889	228,302	15%
New York City	8,550,405	8,935,582	385,177	5%	9,749,753	1,199,348	14%
Bronx	1,455,444	1,505,085	49,641	3%	1,713,975	258,531	18%
Kings	2,636,735	2,736,559	99,824	4%	2,975,386	338,651	13%
New York	1,644,518	1,755,573	111,055	7%	1,835,298	190,780	12%
Queens	2,339,150	2,438,259	99,109	4%	2,687,274	348,124	15%
Richmond	474,558	500,106	25,548	5%	537,821	63,263	13%
Northern New Jersey	7,116,405	7,782,888	666,483	9%	8,425,830	1,309,425	18%
Bergen	938,506	1,010,136	71,630	8%	1,117,243	178,737	19%
Essex	797,434	857,940	60,506	8%	944,660	147,226	18%
Hudson	674,836	707,327	32,491	5%	838,343	163,507	24%
Hunterdon	125,488	146,520	21,032	17%	140,475	14,987	12%
Mercer	371,398	406,576	35,178	9%	444,558	73,160	20%
Middlesex	840,900	924,527	83,627	10%	999,916	159,016	19%
Monmouth	628,715	704,726	76,011	12%	726,854	98,139	16%
Morris	499,509	568,798	69,289	14%	580,946	81,437	16%
Ocean	588,721	632,347	43,626	7%	664,963	76,242	13%
Passaic	510,916	559,266	48,350	9%	620,027	109,111	21%
Somerset	333,654	377,403	43,749	13%	390,136	56,482	17%
Sussex	143,673	164,746	21,073	15%	159,793	16,120	11%
Union	555,786	603,282	47,496	9%	677,817	122,031	22%
Warren	106,869	119,256	12,387	12%	120,133	13,264	12%
Southwest Connecticut	1,991,126	2,200,900	209,774	11%	2,334,010	342,884	17%
Fairfield	948,053	1,048,853	100,800	11%	1,117,402	169,349	18%
Litchfield	183,603	209,762	26,159	14%	204,648	21,045	11%
New Haven	859,470	942,266	82,796	10%	1,011,993	152,523	18%
Total	**22,850,769**	**24,683,099**	**1,832,330**	**8%**	**26,570,163**	**3,719,394**	**16%**

Source: Regional Plan Association; U.S. Census Bureau County Population Estimaates

Measures of Success

The vision scenario combines a rapid rate of job and population growth with compact, mixed-use settlement patterns to help achieve increasing and more widely shared prosperity, improvements in the costs of living and doing business, healthier and more livable communities, and greater resilience to the effects of climate change. These goals can't be achieved just by creating the physical capacity and conditions for this type of growth. All of these will also require actions to improve education, workforce, health, fiscal, governance and other conditions as well.

However, both the level and distribution of jobs, population, housing, open space and land uses are essential foundations that will make it easier or harder to achieve these outcomes. To test how this vision of growth and development would help or hinder making the region more prosperous, fair and resilient, several outcome measures were calculated and compared to what they would be with a continuation of current trends.

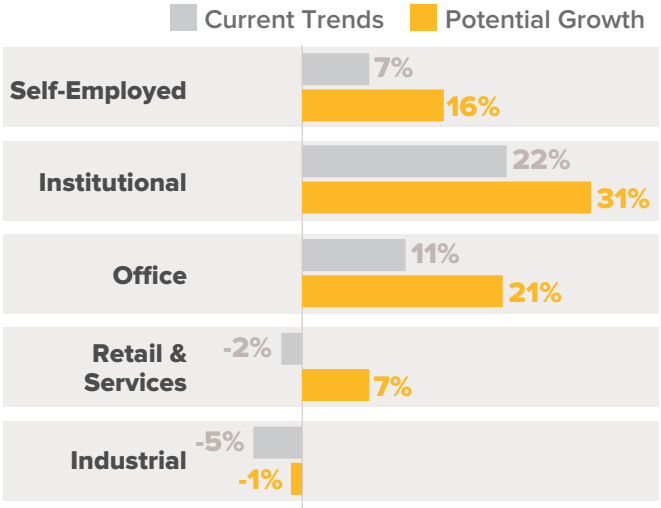
Level and type of job growth

Both the number and type of jobs are essential for raising incomes and expanding opportunity. More robust job growth will reduce unemployment and increase labor force participation, and create a more dynamic labor market that increases chances for advancing into higher paying jobs. The degree to which new jobs improve household incomes and reduce poverty depends on the mix of wage levels and skill requirements, and how well these match education, workforce and employment policies.

Metropolitan policies cannot change the structural economic trends that have resulted in wage stagnation and the slow growth of middle-income jobs relative to low and high paying jobs. However, land use, transportation, housing and economic policies can make the region more or less competitive for different types industries.

Compared to current trends, the RPA vision has more jobs in every major sector. Institutional, office and retail/service jobs all grow by about 10 percentage points more than with current trends. Industrial jobs decline by one percent rather than five percent. Therefore, the vision scenario would create more jobs at all skill and wage levels, but would do less to change the distribution of jobs. It does reinforce the need for strategies to raise skill levels and improve economic mobility, and for land use and economic development policies that expand and modernize the region's commercial space while maintaining and upgrading the space needed for competitive production and distribution activities.

Figure 13: Job growth by industry



Source: Regional Plan Association; Moody's Analytics

Job and labor access

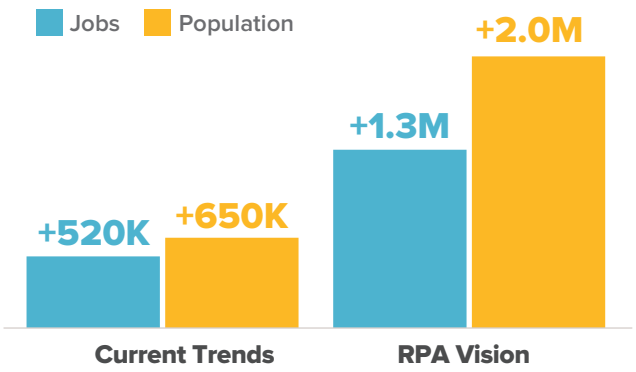
Regional strategies can improve both economic competitiveness and access to opportunity by attracting jobs to places with access to a large, diverse labor pool. These strategies can have an even greater impact on reducing poverty and improving upward mobility when they support investment in low-income communities.

One way to improve access to labor for businesses and access to jobs for workers is to expand jobs in commercial and mixed-used centers near transit. Currently, 58% of existing jobs are within a half mile of a subway or commuter train station. Current trends would maintain that

share , while the RPA vision would attract 70% of new jobs to within a half mile of existing transit. New transit services would put even more jobs within walking distance of transit.

Expanding population near transit can have a similar impact in increasing the number of jobs that people can reach via transit. The share of new residents living within a half mile of existing train stations would increase to 54% in the vision scenario, compared to 37% projected by current trends.

Figure 14: New jobs and population within a half-mile of existing subway or commuter rail stations



Source: Regional Plan Association; U.S. Census America Community and Longtitudinal Employer-Household Dynamics data

The vision scenario would also substantially increase the number of jobs in low-income municipalities, which include older industrial cities, some low-income suburban communities and depressed rural areas. Jobs would grow by 23% in municipalities with the lowest median household income, higher than the growth for the higher income quintiles and much higher than the 8% in under current trends. This will put more jobs within commuting distance of low-income residents, and will also help improve the tax base and physical environment of these places, helping to reverse cycles of disinvestment and improve schools, public safety and other needs.

Table 9: Job Growth by income quintile of municipality

		Current Trends 2015-2040		RPA Vision 2015-2040	
Quintile	2015	Growth	%	Growth	%
Lowest	3,075,376	234,490	8%	721,212	23%
2nd	3,982,411	336,037	8%	584,139	15%
3rd	1,594,120	95,107	6%	192,703	12%
4th	2,056,092	137,571	7%	272,857	13%
Highest	909,759	49,118	5%	103,349	11%
Total	**11,617,758**	**852,324**	**7%**	**1,874,259**	**16%**

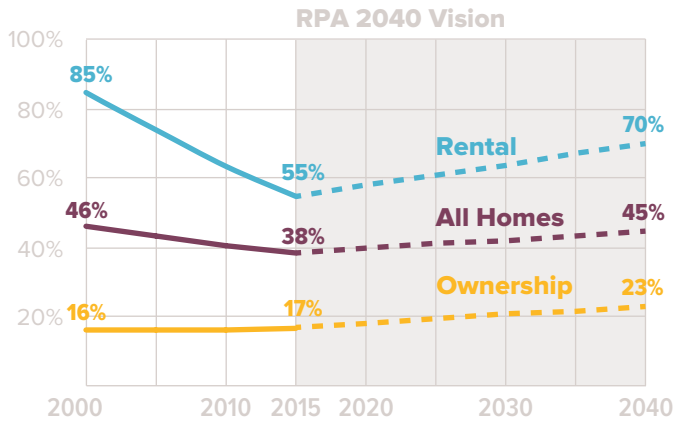
Source: Regional Plan Association; U.S. Census Bureau American Community Survey 2010-2014; Moody's Analytics
Note: Municipalities are approximated by Census County subdivisions, which were then analyzed based on their Median Household Income into quintiles

Housing affordability

The RPA vision would reduce the gap between housing costs and household incomes in two ways. It would increase supply enough to meet future demand and loosen vacancy rates, and it assumes housing policies would regulate or subsidize more low-income housing. Both actions are necessary because the size of the affordability gap for low and moderate-income households is too large to be filled through construction of market rate housing alone in any realistic scenario.

The current trend scenario would continue housing production at the same level as the 1990-2009 period, about 60,000 new units each year. By contrast, new housing expands at the rate of 90,000 per year in the vision scenario, enough to meet estimated future demand and increase tight vacancy rates. Because affordability and vacancy rates vary by location and type of housing, it targets more rental or for sale housing in counties where demand is greatest. It also assumes that at least 20% of new housing construction is built for low-income households. Using these assumptions, the number of homes that require no more than 30% of income would increase at all income levels. At 80% of median income, the share of affordable housing units would increase from 55% to 70% for rental homes, and from 17% to 23% for owner-occupied homes.

Figure 15: Housing affordability at 80% of median income, 2000-2040



Source: Regional Plan Association; U.S. Census Bureau American Community Survey 2010-2014

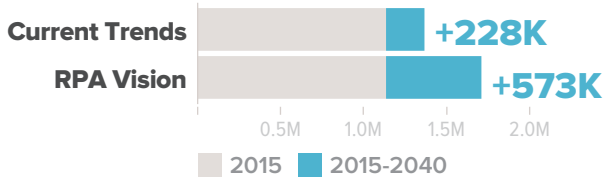
It is important to note that many of the homes that would be affordable to low and moderate income households would not be available to households below those income levels because they are already occupied by higher income renters and owners. Therefore, increasing the share of homes that are affordable to households at 80% of median income to 70% does not mean that 70% of low-income households will live in affordable homes. The share will increase from greater availability, but will fill less than 70% of the need.

Housing choice and segregation

Because affordable housing in concentrated in low-income and racially segregated neighborhoods, access to quality housing, safe streets, good schools and other assets is far more limited for persons of color and low-income households. Improving access to opportunity requires both increasing investment in poor communities and expanding affordable housing in affluent communities. As a measure of how much housing choice can be extended to higher-income communities, the location of new multifamily housing is an important benchmark. Multifamily homes, from townhouses to apartment buildings, can more easily support a wide range of incomes and inclusionary zoning.

Multi-family housing increases by 51% in areas with average incomes that are in the top two-fifths of the region's households in the vision scenario, more than twice as fast as the 19% increase projected with current trends. This is also higher than the 43% increase projected for areas in the lower three-fifths of average income.

Figure 16: New multi-family housing in high-income Areas[6]

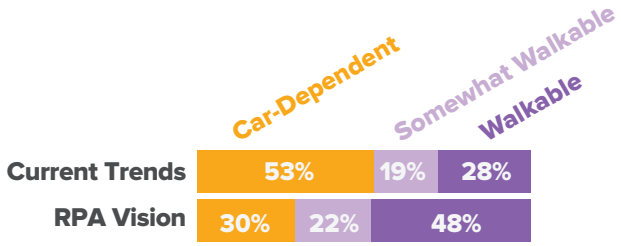


Source: Regional Plan Association; U.S. Census Bureau American Community Survey 2010-2014; U.S. Census Bureau County Population Estimates 2015

Walkable Communities

Living in communities where it is safe, easy and pleasant to walk to stores, schools, parks, transit and other destinations can improve both health and quality of life. By one measure, 43% of the region's population lives in communities that have the street networks, densities and mix of uses of a walkable community.[7] Continuing current trends would result in only 28% of new residents living in neighborhoods that are currently walkable . Under the vision scenario, this would increase to 48%. Using a broader definition that includes somewhat walkable places, 46% of new residents would live in these neighborhoods under current trends compared to 70% in the vision scenario. The number of walkable neighborhoods could also be increased through transit and public space investments.

Figure 17: Share of new population in walkable communities



Source: Regional Plan Association; 2014 Walkscore®

Noxious Uses

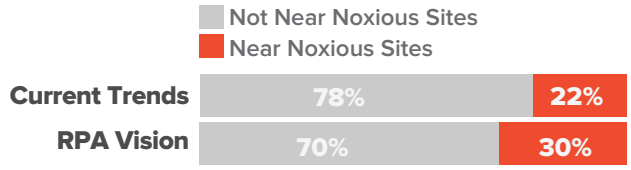
Five and a half million people, 24% of the region's population, lives near facilities such as waste facilities, chemical storage plants and other activities considered to be noxious uses that generate air or water pollution and may contribute to a range of health and safety problems

6 "High-income" areas are those County Subdivisions with a majority of households gaining incomes that place them in the highest or second highest income quintile.

7 Source Walk Score® 2014; Note: The Walk Score® rankings were generated from the centroid of each block group, and then aggregated to RPA's grid. Grid cells were classified as "Walkable" if the majority of the grid cell fell within "Walkable" Census block groups – the centroids of which were either classified as "Very Walkable" or "Walker's Paradise" by Walk Score®. Those classified as "Somewhat Walkable" are either 50% or more "Somewhat Walkable" or 30-50% "Walker's Paradise" or "Very Walkable."

and erode quality of life. Residents who live near these facilities are more likely tend to be poor , or Hispanic. The vision scenario would put more people in proximity of these facilities, primarily because they tend to be in denser areas near transit that are favored for new housing, Thirty percent of new population would live near one of these uses, compared to 22% in the current trend scenario. This challenge that would need to be addressed by looking at alternative uses where possible, and mitigation where it is not.

Figure 18: Share of new population near noxious uses

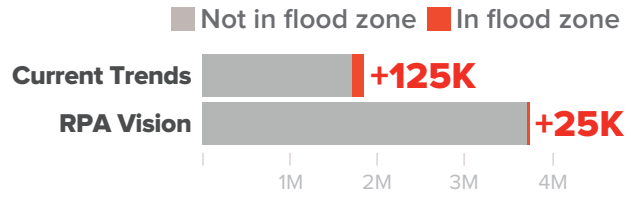


Sources: Regional Plan Association; U.S. Environmental Protection Agency

Persons at risk of flooding

Sea level rise and more frequent and intense storms will put more people at risk of flooding as the effects of global warming increase. Most of the increased risk will come from expansion of areas at risk of flooding. By2050, a million more people would live in the flood zone even without any additional population growth. With current trends, an additional 125,000 people would live in the flood plain, 7% of projected growth. In the RPA vision, only 25,000 additional residents, 1% of total growth, would live in these vulnerable areas, all of them in already dense urban areas that will need strong flood protection measures.

Figure 19: New Population within the 2050 Flood Zone

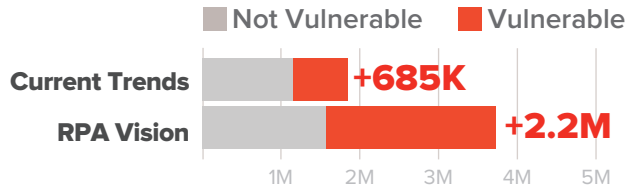


Source: Regional Plan Association

Persons at risk of extreme heat

Rising temperatures also pose a threat to health and safety in inland areas. Heat waves will be more frequent and intense, with the elderly and those with respiratory and heart ailments most as risk. Paved areas trap heat more than undeveloped green space, creating what's known as an "urban heat island effect." Since the RPA vision has more population growth going to the urban core and downtowns, it puts more people at risk of extreme heat than the current trends scenario. Fifty-eight percent of new residents, a total of 2.2 million, would be in areas susceptible to the urban heat island effect. With current trends, 37% of population growth, 685,000 new residents, would be in these locations. The projection reinforces the need for green roofs, tree plantings and other ways of integrating nature into the built environment, as well as services and protections for the elderly and others at particular risk.

Figure 20: New Population Vulnerable to Urban Heat Island Effect



Sources: Regional Plan Association; USGS Land Cover Institute

Greenhouse gas emissions

Greenhouse gases, the primary cause of global warming, are emitted by any use of fossil fuels in power generation, commercial and industrial use, residential use and transportation. To reduce greenhouse gases, any increase in jobs or population would need to be more than matched by greater energy efficiency, reduced consumption or substituting fuel sources with lower carbon emissions. Without these actions, the vision scenario would generate more greenhouse gases than the current trends scenario, However, because a higher percentage of people would live in places that are more energy efficient, the average household would produce 6% less greenhouse gas emission in the RPA vision than in the current trends scenario.

Figure 21: Reduction in housing & transportation greenhouse gas emissions per household, 2015-2040, resulting from changes in urban form[8]

Source: Regional Plan Association

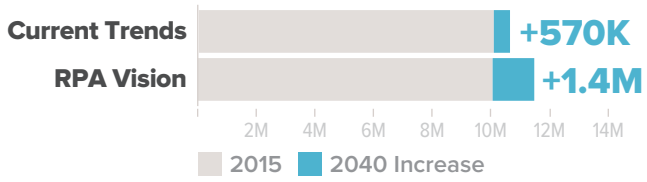
8 These numbers reflect a reduction in housing and transportation emissions as a result of more compact urban growth. They do not include changes to energy sources or improvement of energy efficiency of buildings and vehicles. Nor do they include commercial emissions, or emissions from goods, services and food.

Commutation

Preliminary analysis indicates that RPA's vision would result in 1.4 million additional trips to and from work each day by 2040, about two-and-a-half times as many trips as predicted by current trends. This would include a 12% increase in work trips into the central business district, with 85,000 coming from west of the Hudson River, 69,000 from other parts of New York City, and 45,000 from Long Island, Connecticut and the eastern Hudson Valley. Trips within New York City, excluding those destined for the CBD, would increase by 320,000, an increase of 16%. Within New Jersey, trips would increase by 399,000, or 14%. Trips within Long Island would increase by 124,000, or 12%. Within Connecticut, trips would increase by 108,000 or 13%, and in the Hudson Valley by 93,000, or 12%.

Because the current trend scenario has more workers relative to jobs outside of New York City, it results in more trips into the CBD from outside the five boroughs, and fewer trips within these areas. There are also far fewer trips within New York City than in the RPA vision. By implication, achieving the vision will require substantial increases in transportation capacity in all parts of the region, but with more intra-county and intra-borough travel and less into the CBD than is likely under current trends. Future modeling by RPA will refine these estimates in the coming months,

Figure 22: Increase in Work Trips, Current Trends and RPA Vision, 2015-2040



Source: Regional Plan Association; U.S. Census Bureau, American Community Survey 2006-2010

Table 10: Growth in Sector-to-Sector Trips by Origin, Current Trends and RPA Vision, 2015-2040

	Current Trends 2040		RPA Vision 2040	
ORIGIN	Absolute Change	Percent Change	Absolute Change	Percent Change
Central Business District	31,783	9.3%	40,017	11.7%
New York City	57,503	1.8%	390,941	12.0%
Long Island	94,855	7.1%	184,711	13.9%
Hudson Valley East	58,225	9.4%	105,398	17.1%
Hudson Valley West	39,874	9.5%	47,965	11.5%
New Jersey	222,427	7.0%	520,242	16.3%
Connecticut	66,302	7.6%	127,106	14.5%
Regional Total	570,969	5.7%	1,416,380	14.1%

Source: Regional Plan Association; U.S. Census Bureau, American Community Survey 2006-2010

Table 11: Growth in Sector-to-Sector Trips by Destination, Current Trends and RPA Vision, 2015-2040

	Current Trends 2040		RPA Vision 2040	
DESTINATION	Absolute Change	Percent Change	Absolute Change	Percent Change
Central Business District	142,931	7.6%	228,486	12.2%
New York City	198,971	8.6%	439,921	19.1%
Long Island	52,874	4.5%	131,963	11.3%
Hudson Valley East	26,035	4.6%	70,290	12.4%
Hudson Valley West	16,643	4.9%	31,599	9.3%
New Jersey	109,438	3.7%	402,221	13.6%
Connecticut	24,077	2.8%	111,901	13.2%
Regional Total	570,969	5.7%	1,416,380	14.1%

Source: Regional Plan Association; U.S. Census Bureau, American Community Survey 2006-2010

Appendix A: Methodology for Population Projections

Population for the 31-county region was projected to 2040 from a base population of 2010 using a cohort-component method that disaggregated birth, death and migration rates. Population was projected for male and female five-year age cohorts using best available data for birth and death rates. Migration rates were then adjusted for each cohort using different assumptions for employment growth, labor force participation and housing supply. Age-specific migration rates for 1990-2010 were used as a base and adjusted up or down to match assumptions for different scenarios. The potential growth scenario estimated the region's potential population unconstrained by housing supply or infrastructure by increasing net migration rates to produce the labor force required to meet projected employment demand. By contrast, the current trends scenario lowered migration rates to match the region's current rate of housing production.

Households were projected using age-specific headship rates that used historical data on the number of households headed by different age cohorts.

Regional projections were built up from county-level cohort projects. However, migration adjustments were made at the regional scale, i.e., with a few exceptions described below, county migration rates were adjusted by the same factor to match region-wide labor force needs in the potential growth scenario and region-wide housing supply in the current trend scenario. Final county projections were made using the allocation method described on Appendix C.

Cohort-Component Projection Process

To determine the population after the next five years from base year 2010 (Y0) to the successive years (Yt where t = 2015, 2020, 2025, 2030, 2040), it is necessary to calculate the following:

1. **Survived Population**: The population from Y_0 that is still alive in Y_t
2. **Births**: how many births there will be in the region from the surviving female population in Y_t
3. **Net migrants**: how many people move in/out of the region between Y_0 and Y_t

These combine to get the net population in year t, repeated for successive years:

$$P_t = (\text{survived population}_t) + (\text{births}_t) - (\text{net migrants}_t)$$

1. Survived Population

To calculate the survived population, unique life tables were created for each county by sex, for a total of 62 life tables. Data was averaged for the years available to generate an average number of deaths per year. Life tables (sometimes called mortality tables) are a tool used by actuaries and demographers as a way to predict the mortality of a population. Various factors such as age, sex, and ethnicity can be factored into the life tables. Using a series of calculations from mortality and population data, the tables predict various statistics about the mortality of the population, including life expectancy.

Mortality data was obtained from the three state health departments. Data for deathsby age, gender, and county was available in aggregate tables covering the years of 2000-2011. Any suppressed data was treated as 1 death in the 11 year period. Deaths from 2000-2011 were averaged for an annual mortality rate by age, gender, and county.

We used the 2010 Census and the number of deaths per cohort per year between 2000 and 2011. The three years of death statistics were averaged to obtain an average number of deaths per year per age cohort by sex.

With the survival rate, we are able to calculate the future population in year t as follows:

$$\text{survived population}_t = S(x) \cdot P_0$$
$$\text{where } P_0 = \text{population in } Y_0$$

The projected survival rates assumed that current age-specific death rates would continue into the future. Since the average life span has increased over recent decades, this is a conservative assumption. If life spans continue

to increase, then survival rates, total population and the older population in particular could be higher than this forecast.

2. Births

To calculate the number of births in the next five-year period, the surviving female population was multiplied by an Age Specific Fertility Rate (ASFR).

$$Births_t = (ASFR) \times Survived\ Female\ Population_t$$

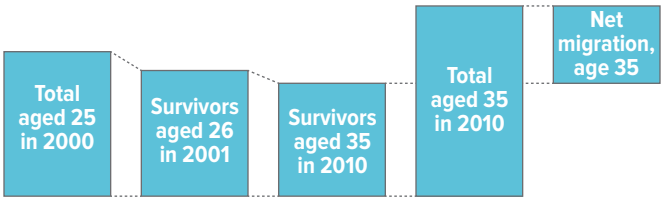
This fertility rate was determined by gathering data for births by age of mother (for five year cohorts <15, 15-19, ..., 40-44, 45+) for each county for the years 2009, 2010, and 2011. These three years of statistics were averaged to generate the average number of births per year. Finally, this number was divided by the female population in each age cohort in 2010 and multiplied by five (since the number of births was calculated for the next five year period to year t).

The ASFR gives the number of births per woman of each age cohort per five years time, and when multiplied by the survived female population, provides the number of births in each five-year period. The forecasted births were split into male and female infants by creating a sex ratio for each county.

ASFR = (average number of births per year) / (female population in age cohort in 2010) · 5

3. Net Migration

Net migration is the number of in-migrants minus out-migrants. To calculate historical migration rates, the amount of "expected" or "surviving" population based on life tables and fertility rates (as described above) is compared to the actual observed population of that same year. The diagram below, from CT Data Center's methodology, demonstrates this concept:



For this analysis, historical net migration rates were calculated by the University of Wisconsin based on population from the decennial U.S. Census.[9] Their net migration rates were calculated by decade, county, five year age cohorts, sex, and race from 1950 to 2010.[10]

Migration rates over the 1990-2010 period were used as a baseline for projecting forward to 2040. This provided a longer period for analysis than just the most recently available decade, and overlaps with the 1996-2014 period used as a baseline for assumptions about future employment growth. But this historical period is only one indication of the direction for future migration, which will also depend on relative economic conditions and housing prices, levels of foreign immigration and other factors.

For both the potential growth and current trend scenarios, migration rates for people over 65 were held constant at the 1990-2010 rate. This age group is less sensitive to changes in employment opportunities. Migration rates for the working age population were increased in the potential growth scenario after labor force participation was increased as described below to provide the workforce needed to match projected employment growth. Migration rates for children were increased at the same rate as the working-age adult population. For Manhattan, Queens and Hudson counties, the already high migration rates for young adults were increased less than for other counties or age cohorts.

The resulting number of households was projected as described below, and the number of housing units needed to accommodate this increased population and increase vacancy rates to reduce housing costs was calculated. The resulting 91,000 units per year compares to a rate of 59,000 units per year added from 1990-2009. Historical data on new housing units was calculated from the year a housing unit was built according to the U.S. Census. This data was compared to the number of residential building permits issued for the same period, as well as fluctuations in occupancy rates, and found to be the most reliable source for estimating net new housing supply. The annual number of units was somewhat higher in the 2000-2009 decade than in the 1990-1999 decade. Data after 2009 was too limited to include in the calculations.

For the current trends scenario, migration rates were reduced proportionally for all age groups under the age of 65 by the amount needed to accommodate population growth with an annual rate of housing production of 60,000 per year, similar to the 1990-2009 rate.

Labor Force Participation

Future levels of employment by age and gender were estimated based on recent trends in employment-to-population ratios from 2000-2013 and on estimates of future changes to labor force participation developed by the Bureau of Labor Statistics (BLS) by age and gender for the period 2012-22. Because BLS estimates for the nation and

9 Winkler, Richelle, Kenneth M. Johnson, Cheng Cheng, Jim Beaudoin, Paul R. Voss, and Katherine J. Curtis. Age-Specific Net Migration Estimates for US Counties, 1950-2010. Applied Population Laboratory, University of Wisconsin- Madison, 2013. Web. < http://www.netmigration.wisc.edu/>.

10 More detail on their methodology is available here: http://www.ssc.wisc.edu/cde/cdewp/2013-04.pdf.

recent local trends often differed, the ratio of the change in employment-to-population for the region compared to the nation was projected forward.

Employment-to-population ratios account for both changes in labor force participation and in changes in the unemployment rate. The projections accounted for the decline in regional unemployment recorded for 2013-2015. Thereafter, it assumed no changes in the unemployment rate, so changes in employment-to-population matched expected changes in labor force participation.

In general, BLS projects declining labor force participation rates for most age-sex cohorts under 55, particularly for 16-24 year olds. Participation rates increase for all age-sex cohorts over 65. In most cases, increases in employment-population ratios increased faster in the region than in the nation over the 2000-2013 period, especially in younger age groups. This ratio was projected forward on the expectation that the robust job growth projected for the potential growth scenario would continue to improve employment rates relative to the nation. The result was that that labor force participation declined less in the region than in the nation in younger age groups and increased for some older age groups.

This adjusted rate of change in employment-to-population was continued through 2030. After 2030, the ratio was held constant for all age groups.

Households

Households were estimated using headship rates, which represent the likelihood of an individual at a particular age to serve as head of a household. Headship rates were calculated from 2010 census data by dividing the total number of households headed by each 5-year age cohort in each county by the total number of residents in the county in each age cohort living in households (as opposed to those living in group quarters—nursing homes, prisons—that were excluded from this calculation).

Then, to calculate future households, this headship rate is multiplied by the future population in each age cohort for each county.

$$Households_{Future} = Headship\ Rate_{2010} \times Population_{Future}$$

Because the region's population is getting older, and persons over 65 have smaller households, this results in smaller number of persons-per-household, continuing past trends. It also results in more households and the need for more housing units to accommodate new population than in the past.

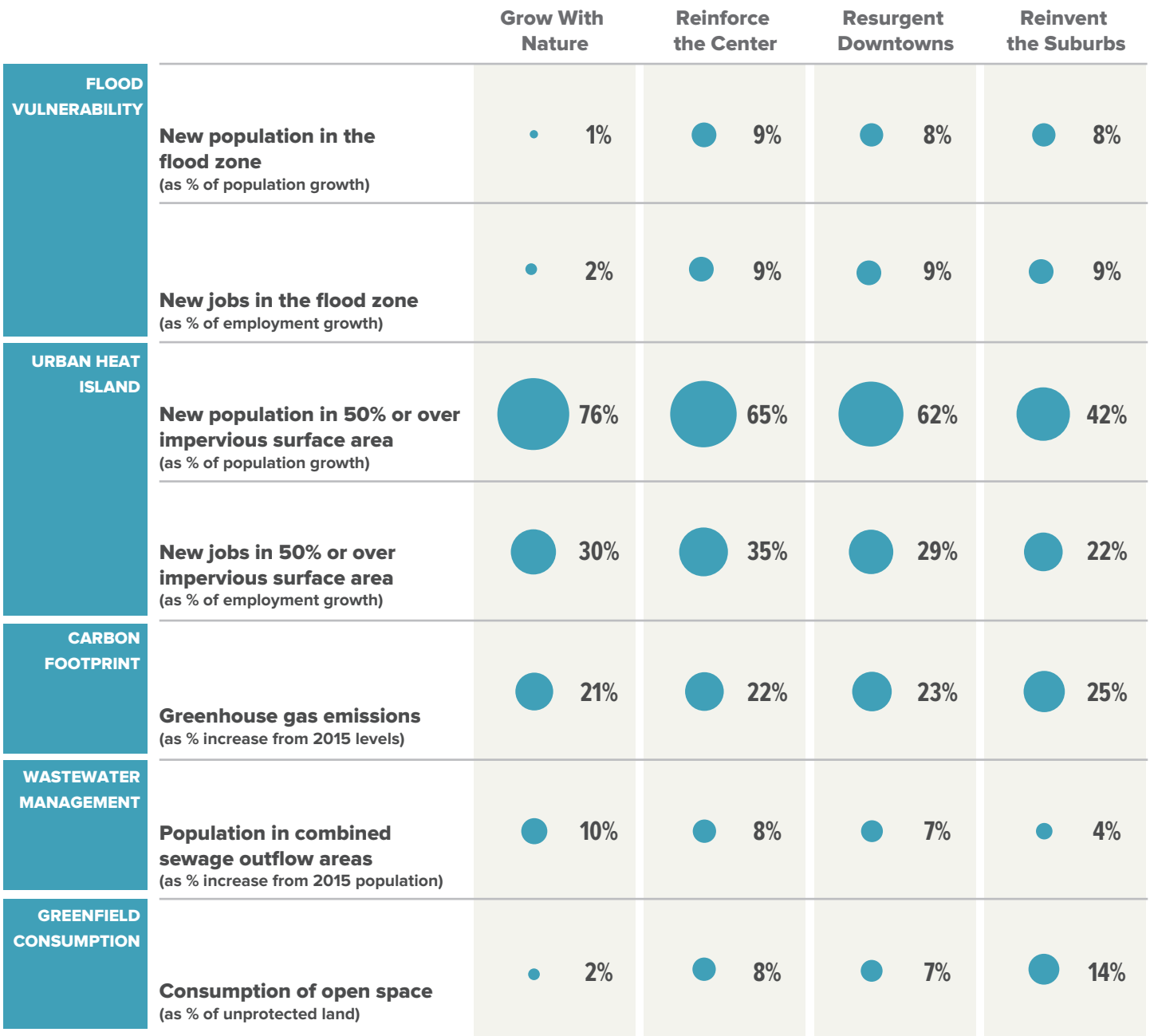
Population by Race/Ethnicity

Race and ethnicity were not included in the original cohort-component population projection based on conversations with Cornell and CT State Data Center. Based on their experience, adding race into the calculations before (and therefore needing to gather survival rates and fertility rates by race) adds more complexity, but not more accuracy, to the analysis.

To project future changes in race and ethnicity, migration rates by race available from University of Wisconsin were applied by five-year age-sex cohorts, which were adjusted the same way as migration rates were previously adjusted for the two scenarios. In essence, the projection assumes that past proportions of migration by race and ethnicity would continue in the future.

Appendix B: Scenario Outcome Metrics

		Grow With Nature	Reinforce the Center	Resurgent Downtowns	Reinvent the Suburbs
TRANSIT ACCESS	**New population near train stations** (as % of population growth)	92%	85%	85%	72%
	New jobs near train stations (as % of job growth)	83%	88%	82%	75%
ACCESS TO OPPORTUNITY	**New population in high-performing school districts** (as % of population growth)	16%	20%	20%	28%
	New jobs in mostly non-white, high poverty areas (as % of job growth)	14%	17%	15%	10%
ACCESS TO PARKS	**Increase in population near parks** (as % increase over 2010 population)	22%	21%	20%	18%
ACCESS TO FOOD	**Increase in population near supermarkets** (as % increase over 2010 population)	26%	22%	22%	17%


Grow With Nature
Reinforce the Center
Resurgent Downtowns
Reinvent the Suburbs
FLOOD VULNERABILITY
New population in the flood zone
(as % of population growth)
1%
9%
8%
8%
New jobs in the flood zone
(as % of employment growth)
2%
9%
9%
9%
URBAN HEAT ISLAND
New population in 50% or over impervious surface area
(as % of population growth)
76%
65%
62%
42%
New jobs in 50% or over impervious surface area
(as % of employment growth)
30%
35%
29%
22%
CARBON FOOTPRINT
Greenhouse gas emissions
(as % increase from 2015 levels)
21%
22%
23%
25%
WASTEWATER MANAGEMENT
Population in combined sewage outflow areas
(as % increase from 2015 population)
10%
8%
7%
4%
GREENFIELD CONSUMPTION
Consumption of open space
(as % of unprotected land)
2%
8%
7%
14%

COMMUTATION FLOWS	Grow With Nature	Reinforce the Center	Resurgent Downtowns	Reinvent the Suburbs
Manhattan CBD from NYC, excluding CBD (as % change from 2010)	32%	28%	15%	3%
Manhattan CBD from outside NYC (as % change from 2010)	7%	41%	21%	21%
Within NYC, excluding CBD (as % change from 2010)	25%	21%	15%	12%
Within New Jersey (as % change from 2010)	12%	12%	18%	20%
Within Long Island (as % change from 2010)	13%	11%	18%	24%
Within Hudson Valley (as % change from 2010)	10%	10%	17%	21%
Within Connecticut (as % change from 2010)	9%	9%	16%	20%
Within areas outside NYC (as % change from 2010)	11%	11%	18%	21%

Appendix C: Population and Jobs Allocation Method

After finalizing population and employment projections for the region as a whole and classifying the physical place types, an allocation model distributed jobs and population at a fine geographic resolution. The process relied on many assumptions about the driving factors of growth. The geographic scale of the allocation is the same half-mile by half-mile grid as the place typology. Through an iterative process of allocation and interpreting the implications of different distributions of population and jobs, adjustments were made until the distribution reflected the optimal balance of outcomes for achieving expanded opportunity, improved affordability, better health and livability, and improved sustainability and resilience. The process was the same for both population and jobs, except where otherwise noted. The allocation of population and jobs has three components: 1) an initial allocation based on place type and subregion, 2) allocations within place types using a set of growth factors, and 3) adjustments to specific places of interest.

Allocation by Place Type by Subregion

There are five subregions and sixteen place types for a total of 80 combinations, but since some place types do not occur in every subregion, the actual number of place type by subregion classifications is 67. Each of the 67 categories was assigned a share of the total growth. These growth shares were assigned based on several quantitative and qualitative characteristics, including the past trends in population and job growth, assumptions on how past trends may change, and RPA's assumptions on which types of places are most appropriate for sustainable and healthy growth. Jobs were disaggregated into four sectors—office, industrial, health and education, and retail and service—that were allocated differently to account for the different types of places in which these cluster (e.g., office jobs are concentrated in the urban core and downtowns, while health and education are more distributed among population centers).

RPA Subregions

Subregion	Counties
Hudson Valley	Dutchess, Orange, Putnam, Rockland, Sullivan, Ulster, Westchester
Long Island	Nassau, Suffolk
New York City	Bronx, Kings, New York, Queens, Richmond
Northern New Jersey	Bergen, Essex, Hudson, Hunterdon, Mercer, Middlesex, Monmouth, Morris, Ocean, Passaic, Somerset, Sussex, Union, Warren
Southwest Connecticut	Fairfield, Litchfield, New Haven

The share of growth was multiplied by the total regional projected growth to establish the amount of population or jobs for each place type by subregion classification. The growth was then distributed to the cells within each place type by subregion classification proportionally. In other words, for each grid cell, the share of its classification was calculated, which dictated the initial amount of the classification's growth.

Additional Growth Factors

The purpose of adding growth factors was to account for place-specific characteristics that should benefit or penalize specific places in terms of the amount of growth, such as distance to a rail station or the level of flood risk. Each cell was assigned a value between 0 and 4 for positive characteristics, or -4 and 0 for negative characteristics. The values were then weighted based on their relative importance. The table below contains the complete list of growth factors and their weights. The initial growth allotted to each grid cell was multiplied by a growth factor representing several additional characteristics of that specific cell. The scores for all characteristics was totaled, then normalized to calculate a growth factor around an average value of 1.

Table X2. Growth Factor Component Characteristics and Weights

Characteristic	Weight	Description	Purpose
Transit Access	2; increased to 4 for lower density commercial and industrial corridors outside NYC (place types 07, 08, 09, and 10)	Proximity to a train station up to 0.5 miles, with relative scores accounting for station quality of service and capacity	To encourage growth in places with the greatest access to the region's job and labor market., For commercial and industrial corridors, access to labor market via transit was judged particularly important for growth.
Employment Access by Car	1	Number of jobs within a 60 minute commute by car	To encourage growth in places with more economic opportunities not captured by transit access
Vacant Land	1; increased to 3 for New York City grid cells to reflect higher value of scarce land	Area of vacant, developable land	To encourage growth in places that have more physical space for development
Ecological Sensitivity	1	Index measuring the ecological vulnerability and importance to surrounding habitat.	To discourage growth in areas where ecological functions are most critical
Income	1	Income by quintile	To encourage affordable housing growth to make affluent communities more inclusive
Poverty Rate	1	Poverty rate by quintile	To encourage growth to help revitalize communities
Relative Density	1.5	The percentage of cell relative to the average density of the highest quintile by place type, i.e. a grid cell among the densest of its place type will receive a low score	A proxy for capacity; to encourage growth in places with more capacity
Flood Risk	N/A; the flood risk component was applied as its own factor to each grid cell's growth based on place type (types 01 and 02, 75 percent; types 03, 04, 05 and 06, 90 percent, and all others 100 percent)	Percentage of the grid cell in the projected 2050 flood plain	To discourage growth in places at high risk of flooding.

This growth factor was then applied to the initial allocation for each grid cell. For example, cell y initially allocated 100 new people and given a growth factor of 1.2, the new allocation would be 120. The adjusted allocation figures then had to be reconciled with the total allocation per place type by subregion category. The reconciled amount of growth for each cell was calculated according to the formula s

Where is the amount of growth of cell y of place type x after applying the growth factor, is the amount of total growth for place type x after applying the growth factor, and is the amount of growth initially allocated to place type x.

Adjustments to Specific Places

The final step in the allocation process was adjustments to 131 specific places that either exemplify the characteristics of a place type or have potential for more transformative change. The purpose in identifying these places was both to check the results of the model in familiar places, but also to account for drivers or obstacles to growth in specific places that cannot be accounted for with the allocation model. Places of interest were classified into several categories:

- **Downtowns**: The historic core of cities and towns across the region.
- **Edge Cities**: Clusters of suburban commercial activity.
- **Corridors**: Linear stretches of suburban commercial activity, typically along highways.

Within New York City, several more categories of places of interest were classified:

- **Growth potential**: Neighborhoods identified by past studies as having capacity for significant growth.
- **Future Transit**: Areas adjacent to future transit projects with the potential to densify.
- **Hub**: Areas that already serve as secondary commercial hubs in New York City that have more potential for growth.

To determine the appropriate amount of growth for the these places, indicators like past growth trends, historic peak population, socioeconomic factors, and the initial allocations generated by the model, as well as qualitative characteristics were considered. Where intervention in the model's result for a place was deemed necessary, new growth figures were entered.

Within each place of interest, the adjusted growth was allocated in the same manner as for the rest of the map, but drawing from its own total growth figure. Similar to the growth factor process described previously, the new fig-

ures had to be reconciled to maintain the regional growth total. In this case, subregions were adjusted proportionally if the sum of the growth going to places of interest in each subregion was greater or less than the initial allocation.

Allocations for the Current Trends Scenario

To contrast the aspirational scenario with growth patterns under current trends, jobs and population were projected assuming that past trends by place type would continue. This projection assumes that future growth would be constrained by limits on housing supply and infrastructure. It assumes that new housing construction would continue at a rate similar to the 1990-2009 period, approximately 60,000 per year, which would limit the number of new jobs that the region would have the labor force to support.

Total jobs and population were distributed using the same method described under Allocation by Place Type by Subregion above. For population, it was assumed that each place type would capture the same share of growth as it did for 2000-2010. For jobs, it was assumed that the share of growth each job sector experienced for the historical period for which data was available, 2002-2011. The share of jobs per sector within each place type was then computed to determine each place type's share of job growth. This likely overemphasizes the share of job growth that would likely go into the urban core, since jobs were unusually concentrated in New York City during this historical period. No assumptions were made about the effects of current or future policy changes or infrastructure investments.

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Regional Plan Association is an independent, not-for-profit civic organization that develops and promotes ideas to improve the economic health, environmental resiliency and quality of life of the New York metropolitan area. We conduct research on transportation, land use, housing, good governance and the environment. We advise cities, communities and public agencies. And we advocate for change that will contribute to the prosperity of all residents of the region. Since the 1920s, RPA has produced three landmark plans for the region and is working on a fourth plan due out in 2017. For more information, please visit, **www.rpa.org**.

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