NEW YORK METROPOLITAN TRANSPORTATION COUNCIL
2050 SOCIOECONOMIC & DEMOGRAPHIC FORECAST UPDATE:
DEVELOPMENT & ENHANCEMENTS

TECHNICAL MEMORANDUM 3.1:

DRAFT EMPLOYMENT, POPULATION, LABOR FORCE

DRAFT JANUARY 2020 | FINAL NOVEMBER 2020

Disclaimer

The preparation of this report has been financed through the U.S. Department of Transportation's Federal Transit Administration and Federal Highway Administration. This document is disseminated under the sponsorship of the New York Metropolitan Transportation Council in the interest of information exchange. The contents of this report reflect the views of the authors who are responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of the Federal Transit Administration, Federal Highway Administration or the State of New York. This report does not constitute a standard, specification or regulation.

Title VI Statement

The New York Metropolitan Transportation Council (NYMTC) is committed to compliance with Title VI of the Civil Rights Act of 1964, the Civil Rights Restoration Act of 1987, Executive Order 12898 on Environmental Justice and all related nondiscrimination statutes, rules, regulations and executive orders. NYMTC assures that no person or group(s) of persons shall, on the grounds of race, color, age, disability, national origin, gender, or income status, be excluded from participation in, be denied the benefits of, or be otherwise subjected to discrimination through the federally-mandated metropolitan transportation planning process undertaken by NYMTC, whether the activities are federally funded or not. It is also the policy of NYMTC to ensure that all its plans, programs, procedures, polices, and activities do not have disproportionate adverse effects on minority and low-income populations. Minority and low income communities, as identified through the United States Census, will be engaged to facilitate their full and fair participation in the metropolitan transportation planning process. In addition, NYMTC will provide meaningful access to services for persons with limited English proficiency.

Table of Contents

Table of Figures

1.0 Introduction

The New York Metropolitan Transportation Council (NYMTC) is a regional council of governments (COG) that is the metropolitan planning organization (MPO) for New York City, Long Island and the lower Hudson Valley. NYMTC provides a collaborative planning forum to address transportation-related issues, develop regional plans and make decisions on the use of federal transportation funds. Socioeconomic and demographic (SED) forecasts are crucial components in the development of regional transportation plans, air quality conformity analysis and decision-making on the use of these funds.

In order to update the 2050 SED Forecasts, NYMTC has charged WSP and Urbanomics, in collaboration with the New York City Department of City Planning (DCP), to update the existing 2050 employment, population, household, and labor force forecast models, as well as the TAZ distribution model, to a 2017 base year using the same data sources as in the original 2050 SED forecast models, and then extend the forecast period from 2050 to 2055. These models were created by the Louis Berger Group (LBG) for the original 2050 Forecasting effort and were described in detail in their accompanying technical memoranda.

The initial update of the 2050 Models to a 2017 Baseline was described in NYMTC's *Technical Memorandum 2: Model Update to 2017 Baseline* and was distributed to the members of the Forecast Working Group (FWG) for review and comment. The FWG met on August 22, 2019 to provide initial comment and recommendations on adjustments to the Population and Employment Models. In response to these comments, an Interim Draft Baseline Employment Forecast using the initial recommendations for adjustment was prepared and described in the memorandum dated September 19, 2019, which was then distributed to the FWG for further review. Comments on the interim employment forecasts were collected from members through October 20th, 2019 and the Interim Forecasts were further refined to reflect FWG insights. These Draft Employment Forecasts (Draft) were sent to the FWG for review on November 8, 2019.

The Baseline Employment Forecasts are a key contributing component of the Population and Labor Force Models. As such, it is important that the FWG is comfortable with the Employment Baseline before continuing forward with the modeling efforts, as was to be discussed at the FWG meeting scheduled for December 5, 2019. In advance of that meeting, the Port Authority provided an alternative set of employment forecasts that sought to balance shares of employment growth throughout the Region to be referred to as the Alternative scenario (Alternative). The provision of alternative forecasts was deemed worthy of additional consideration by the FWG; however, the schedule also required that Draft Population Forecasts be provided by the end of December. In order to meet that schedule, both sets of Employment Forecasts (Draft and Alternative) were used to populate the Population and Labor Force Models and the best alternatives derived from each set of employment drivers is presented.

This version of the technical memorandum incorporates comments made on the 11.08.2019 document; presents the Draft and Alternative Employment Forecasts; and provides the resulting Population and Labor Force Forecasts; and, supporting contextual documentation to include labor force participation, unemployment, and multiple job-holding rates.

The purpose of providing all of the information together is so that the FWG has all the necessary context to determine how to proceed with the next steps of reconciling the Employment and

Population numbers for adoption. As the process continues, further adjustments are likely to be made as employment is reconciled with population and labor force distribution.

2.0 Employment

2.1 Draft Baseline Employment

The draft baseline employment forecasts total jobs (both payroll and proprietor) by place of work as modeled by the update of the 2015 Employment Model and adjusted to reflect the insights of the FWG.

2.1.1 Adjustments to the Interim Employment Forecasts

Figure 1 presents the manual adjustments made to the Update and Interim employment forecasts and the rationale behind each change. These adjustments resulted in the Draft Employment Baseline for 2050.

FWG comments from the August 22nd, 2019 meeting were the initial starting point in the revisions of the updates. At this meeting, members provided their impressions on the first set of unadjusted forecasts. Because members have different specialties from economists to transportation planners, some had very specific ideas of how the employment forecasts should differ given their local knowledge, while others were less certain of the specifics. In lieu of alternative specific comments from the County or Agency representative on the FWG, the New York City Department of City Planning (NYCDCP) suggested that the 30-year (1998-2017) historic annual average be used to adjust the initial update. If the comment was vague (too low or too high), as was the case with NYC counties, the historical annual average percent change was used as the employment target. For New Jersey, a comment was made that sub-regional employment is expected to grow by an annual average of 0.4% in future years; the county level growth rates were further adjusted (generally by an additional 15-20 percentage points) to be closer to that sub-regional expectation. These recommendations were initially calibrated to the 8/22 vintage of the Unadjusted Employment Forecasts. When the Population Model inputs were updated and the Unadjusted Employment Model rerun; the adjustments were recalibrated to reach the employment levels determined at the 8/22/2019 meeting, regardless of the unadjusted base.

Upon running these adjustments, it was discovered that the sum of the resulting sub-regional outputs was significantly higher than the regional employment target established at the August 22, 2019 meeting,[1] which put the regional employment beyond what the FWG believed to be a rational possibility. In order to get closer to the regional target, the adjustment for the counties in question was defaulted to the adjustment made by year from 2010-2050 from the adopted forecasts of the 2015 modeling effort.

[1] The description of this step was unintentionally omitted from the Initial Draft of TM 3, submitted November 11, 2018.

Figure 1. County Level Baseline Adjustments

	Source for Interim Adjustment	Interim Adjustment Percentage	Comment on Interim	Final Draft Baseline Adjustment
New York City				
Bronx	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	-18%	Redistribution required among boroughs to reflect development initiatives. Looks slightly high, but waiting for reconciliation with popualtion to adjust further.	65%
Kings		15%		105%
New York		38%		-28%
Queens		60%		158%
Richmond		-27%		44%
Mid Hudson				
Dutchess	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	-35%		-35%
Orange	FWG Comments	-15%		-15%
Putnam	FWG Comments	15%	Old low growth scenario looks best	15%
Rockland	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	-4%		-4%
Sullivan	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	60%		60%
Ulster	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	44%		44%
Westchester	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	35%		35%

Source: Urbanomics from FWG Comments

Figure 1. County Level Baseline Adjustments (pt. 2)

	Source for Interim Adjustment	Interim Adjustment Percentage	Comment on Interim	Final Draft Baseline Adjustment
Long Island				
Nassau	FWG Comments	5%	Nassau: Looks slightly low in utilities, health, and transportation/warehousing.	20%
Suffolk	FWG Comments	0%	Looks good.	0%
New Jersey				
Bergen	FWG Comments	0%	Debate: PANYNJ felt there should be less growth in the Urban Core Counties (Bergen, Essex, and Hudson). NJTPA felt Hudson growth in particular may be understated. Compromisse: Hudson growth increased to reflect development in the pipeline, Bergen and Essex	3%
Essex	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	25%		37%
Hudson	FWG Comments	0%		25%
Hunterdon	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	25%	Smooth out forecasts so no negative interim changes.	35% to 2020, 52.5% 2021 to 2025, 60% 2026-2035, 55% 2036 to 2040, 50% 2041 to 2050
Mercer	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	25%	Fine.	25%
Middlesex	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	25%	While Middlesex did have highest growht from 2010-2017, it needs to come down a bit. Should not have higher growth rate than Hudson County.	-13%
Monmouth	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	55%		53%
Morris	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	45%		33%
Ocean	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	25%	"…a little too high. Overstated due to population growth, but that is primarily retirees. Also significant area (Pinelands) is protected.	-58%
Passaic	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	25%	Growth of only 11,000 jobs from 2020-2050 is too low	55%
Somerset	FWG Comments	0%		-20%
Sussex	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	150%	Should be much lower growth, hard to fit development into available land area. Smooth out forecasts so no negative interims.	95% to 2020, 120% 2021 to 2030 and 2036-2050, 125% 2031 to 2035
Union	FWG Comments	0%	None.	8%
Warren	Annual Average Trend/Defaulted to 2015 Adopted Forecast Adjustment	25%	Smooth out forecasts so no negative interim changes.	60%
Connecticut				
Fairfield	FWG Comments	0%	Good	0%
Litchfield	FWG Comments	0%	Good	0%
New Haven	FWG Comments	0%	Good	0%

Source: Urbanomics from FWG Comments

2.1.2 Adjustment Variations

As noted in Section 2.1.1, some adjustments were made to the employment forecasts between the Interim and December runs of the model. The significant changes since the Interim Draft Baseline Employment are as follow:

- New York City's employment was redistributed to reflect expected development
- The New Jersey sub-region's employment was further distributed to reflect refinements from NJTPA

Figure 2 presents the end year (2050) Total Employment Forecast by county for the four employment vintages of this process to date as well as the respective annual average growth rates for each set of forecasts. These are compared to the 2015 Adopted forecast and the 30 year historic trend.

Figure 2. Comparison of County Level Employment Forecasts 2050 and Annual Average Growth Rate

	2050 Employment				Average Annual % Change					
	Unadjusted 9.12.19	Adjusted 9.13.19	Interim Draft Baseline 11.01.19	Final Draft Baseline for 12.05.19	Unadjusted 9.12.19	Adjusted 9.13.19	Interim Draft Baseline 11.01.19	Final Draft Baseline for 12.05.19	2015 Adopted Forecast	1988-2018 CAGR
REGION	**13,282.0**	**13,641.8**	**13,725.9**	**13,728.3**	**0.27%**	**0.35%**	**0.37%**	**0.37%**	**0.35%**	**0.58%**
NEW YORK CITY	**5,713.8**	**6,010.4**	**6,010.4**	**6,012.1**	**0.29%**	**0.45%**	**0.45%**	**0.45%**	**0.44%**	**0.79%**
Bronx	478.0	464.9	464.9	525.1	0.41%	0.33%	0.33%	0.80%	0.33%	1.59%
Kings	1,044.9	1,069.3	1,069.3	1,215.2	0.29%	0.36%	0.36%	0.87%	0.35%	2.13%
New York	3,203.4	3,411.2	3,411.2	3,051.1	0.32%	0.52%	0.52%	0.11%	0.51%	0.18%
Queens	828.3	912.8	912.8	1,050.0	0.10%	0.38%	0.38%	0.93%	0.36%	1.47%
Richmond	159.2	152.2	152.2	170.6	0.36%	0.23%	0.23%	0.65%	0.23%	2.02%
LONG ISLAND	**1,429.8**	**1,435.2**	**1,451.6**	**1,451.5**	**0.22%**	**0.23%**	**0.26%**	**0.26%**	**0.26%**	**0.61%**
Nassau	697.0	702.4	718.8	718.8	0.29%	0.31%	0.37%	0.37%	0.27%	0.25%
Suffolk	732.8	732.8	732.8	732.8	0.16%	0.16%	0.16%	0.16%	0.25%	0.99%
MID HUDSON	**1,142.7**	**1,167.4**	**1,167.4**	**1,167.4**	**0.26%**	**0.32%**	**0.32%**	**0.32%**	**0.35%**	**0.54%**
Dutchess	145.4	136.3	136.3	136.3	0.40%	0.21%	0.21%	0.21%	0.20%	-0.05%
Orange	182.2	178.1	178.1	178.1	0.39%	0.32%	0.32%	0.32%	0.31%	1.27%
Putnam	31.2	32.1	32.1	32.1	0.11%	0.19%	0.19%	0.19%	0.16%	1.47%
Rockland	153.9	153.0	153.0	153.0	0.50%	0.48%	0.48%	0.48%	0.48%	0.92%
Sullivan	28.7	31.8	31.8	31.8	-0.07%	0.12%	0.12%	0.12%	0.14%	0.58%
Ulster	77.6	82.9	82.9	82.9	0.10%	0.28%	0.28%	0.28%	0.29%	0.16%
Westchester	523.7	553.2	553.2	553.2	0.18%	0.34%	0.34%	0.34%	0.33%	0.29%

Source: Urbanomics from FWG Comments

Figure 2. Comparison of County Level Employment Forecasts 2050 and Annual Average Growth Rate (pt. 2)

	2050 Employment				Average Annual % Change					
	Unadjusted 9.12.19	Adjusted 9.13.19	Interim Draft Baseline 11.01.19	Final Draft Baseline for 12.05.19	Unadjusted 9.12.19	Adjusted 9.13.19	Interim Draft Baseline 11.01.19	Final Draft Baseline for 12.05.19	2015 Adopted Forecast	1988-2018 CAGR
NEW JERSEY	**3,891.7**	**4,026.7**	**3,992.5**	**3,933.2**	**0.27%**	**0.30%**	**0.35%**	**0.35%**	**0.27%**	**0.45%**
Bergen	537.6	537.6	524.0	539.8	0.34%	0.34%	0.26%	0.37%	0.24%	0.11%
Essex	443.7	462.9	459.0	472.0	0.22%	0.27%	0.32%	0.42%	0.26%	-0.35%
Hudson	379.4	379.4	394.2	394.3	0.51%	0.51%	0.63%	0.63%	0.45%	0.48%
Hunterdon	59.2	61.9	61.9	64.7	-0.06%	-0.02%	0.07%	0.22%	-0.02%	0.87%
Mercer	272.2	284.9	284.9	284.9	0.20%	0.15%	0.30%	0.30%	0.15%	0.84%
Middlesex	489.1	508.3	500.6	479.4	0.37%	0.30%	0.44%	0.28%	0.31%	0.88%
Monmouth	303.3	328.4	319.3	327.2	0.03%	0.21%	0.17%	0.25%	0.21%	0.91%
Morris	335.8	360.3	360.3	353.5	0.07%	0.23%	0.26%	0.19%	0.21%	0.77%
Ocean	246.6	255.9	241.0	225.2	0.67%	0.60%	0.60%	0.34%	0.50%	1.67%
Passaic	208.2	216.4	221.3	226.2	0.08%	0.08%	0.25%	0.33%	0.17%	-0.42%
Somerset	237.8	237.8	237.8	229.5	0.44%	0.44%	0.44%	0.31%	0.30%	1.37%
Sussex	44.8	55.9	52.2	53.6	-0.29%	0.13%	0.12%	0.22%	0.14%	0.96%
Union	294.9	294.9	294.9	298.8	0.33%	0.33%	0.33%	0.38%	0.32%	-0.32%
Warren	39.3	41.2	41.2	43.9	-0.01%	0.04%	0.11%	0.33%	0.03%	0.20%
CONNECTICUT	**1,104.1**	**1,104.1**	**1,104.1**	**1,104.1**	**0.25%**	**0.25%**	**0.25%**	**0.25%**	**0.21%**	**0.12%**
Fairfield	561.4	561.4	561.4	561.4	0.25%	0.25%	0.25%	0.25%	0.22%	0.11%
Litchfield	77.6	77.6	77.6	77.6	0.11%	0.11%	0.11%	0.11%	0.14%	0.10%
New Haven	465.1	465.1	465.1	465.1	0.27%	0.27%	0.27%	0.27%	0.20%	0.13%

Source: Urbanomics from FWG Comments

2.2 2017 Draft Baseline Model Outputs

From 2010 to 2050 total employment is projected to expand by 2.7 million jobs (+24.5%) in the NYMTC 31-County Region (Figure 3). Through 2020, growth will be driven by a continuation of the current cyclical expansion[2], which will transition into a period of moderate long-term growth through 2050 as adjusted given FWG member input.

2.2.1 Total Employment

Figure 3. Employment Model County Outputs: 2017 Draft Total Employment

	2010	2015	2017	2020	2025	2030	2035	2040	2045	2050
FORECAST REGION	**11,020,530**	**11,561,224**	**12,008,481**	**12,361,559**	**12,581,650**	**12,804,824**	**13,007,535**	**13,238,042**	**13,476,572**	**13,728,323**
Bronx County	380,497	401,055	413,186	431,616	448,092	462,925	476,447	491,733	507,787	525,130
Kings County	822,989	902,713	940,561	986,540	1,023,656	1,060,293	1,095,501	1,133,188	1,172,376	1,215,218
New York County	2,488,607	2,654,265	2,832,457	2,897,901	2,927,929	2,958,550	2,977,315	3,002,881	3,027,014	3,051,112
Queens County	708,868	753,622	787,733	846,298	881,651	912,511	944,059	978,423	1,013,012	1,050,038
Richmond County	126,268	138,472	140,688	145,675	150,077	153,968	157,292	161,533	165,937	170,577
NYC Total	**4,527,230**	**4,850,126**	**5,114,624**	**5,308,030**	**5,431,405**	**5,548,247**	**5,650,614**	**5,767,758**	**5,886,126**	**6,012,076**
Nassau County	590,583	613,419	631,261	646,165	659,241	671,759	683,347	695,104	706,785	718,774
Suffolk County	636,565	671,508	692,427	699,685	703,242	709,605	713,978	720,000	726,392	732,780
LI Total	**1,227,148**	**1,284,927**	**1,323,689**	**1,345,849**	**1,362,483**	**1,381,364**	**1,397,326**	**1,415,104**	**1,433,177**	**1,451,554**
Dutchess County	121,287	125,663	127,640	128,094	129,362	130,984	132,422	133,868	135,160	136,271
Orange County	150,881	154,794	158,577	162,513	165,083	167,819	169,967	172,749	175,383	178,080
Putnam County	28,439	29,425	29,905	30,372	30,738	31,089	31,285	31,548	31,850	32,145
Rockland County	116,538	122,345	129,310	133,734	137,134	140,953	144,038	146,983	149,929	153,021
Sullivan County	29,577	28,673	29,047	30,719	31,010	31,194	31,247	31,377	31,587	31,839
Ulster County	70,732	71,652	73,270	76,514	77,572	78,581	79,635	80,697	81,759	82,873
Westchester County	444,936	466,908	485,847	502,170	510,905	520,057	527,705	535,663	543,924	553,165
MH Total	**962,390**	**999,460**	**1,033,596**	**1,064,116**	**1,081,804**	**1,100,677**	**1,116,299**	**1,132,885**	**1,149,592**	**1,167,394**
Bergen County	454,800	468,646	477,393	488,344	495,683	503,510	511,656	520,543	530,055	539,837
Essex County	410,788	398,558	409,911	420,764	429,635	436,804	444,330	452,921	462,338	472,047
Hudson County	289,015	302,863	316,525	331,796	341,998	352,439	362,872	372,939	383,433	394,307
Hunterdon County	56,262	60,787	60,082	61,371	61,667	62,304	62,661	63,133	63,683	64,652
Mercer County	247,294	251,046	246,405	261,635	263,356	266,603	270,098	274,090	279,104	284,898
Middlesex County	399,260	416,340	430,707	437,732	441,640	447,818	454,899	462,546	470,791	479,427
Monmouth County	287,779	290,824	297,250	305,774	306,780	308,786	311,517	316,117	321,414	327,250
Morris County	300,861	317,920	326,478	332,703	335,939	339,588	341,899	345,137	349,112	353,516
Ocean County	181,039	187,196	197,721	200,792	205,310	209,216	212,700	217,175	221,458	225,222
Passaic County	200,590	197,746	200,824	206,666	208,786	211,669	214,522	217,969	221,934	226,211
Somerset County	182,781	199,496	206,485	208,078	210,578	213,741	217,126	220,928	225,166	229,514
Sussex County	48,187	48,045	49,204	50,655	50,875	51,069	51,333	51,710	52,632	53,647
Union County	250,208	253,923	263,441	269,275	274,412	279,378	284,203	288,894	293,836	298,824
Warren County	40,045	39,397	39,586	40,560	40,787	41,308	41,909	42,671	43,323	43,870
NJ Total	**3,348,908**	**3,432,786**	**3,522,011**	**3,616,145**	**3,667,446**	**3,724,233**	**3,781,724**	**3,846,771**	**3,918,279**	**3,993,222**
Fairfield County	481,896	503,675	515,458	521,963	528,393	534,535	540,372	547,262	554,162	561,422
Litchfield County	68,609	73,635	73,473	75,148	75,420	75,703	76,053	76,559	77,066	77,579
New Haven County	404,350	416,614	425,629	430,308	434,698	440,065	445,146	451,703	458,169	465,077
CT Total	**954,854**	**993,924**	**1,014,561**	**1,027,419**	**1,038,511**	**1,050,302**	**1,061,572**	**1,075,524**	**1,089,397**	**1,104,077**

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments
Note: Total employment includes payroll employment, self-employment, and unpaid family work

[2] These forecasts do not attempt to predict the timing of business cycles, but are driven by the long term historical drivers as described in TM 1, inclusive of cycles, which moderate expansion.

From 2020 to 2050 employment gains will slow to moderate growth levels reflecting the less robust economic drivers as detailed in Section 3.3.1 of *Technical Memorandum 2: Model Update to 2017 Baseline* [3]. Employment in the Region as a whole is expected to grow at a rate of 0.37% per year, slightly less than New York City's rate of 0.45 percent per year. Of the 704,000 jobs projected to be added in New York City from 2020 to 2050, the largest number will be located in Brooklyn, followed by Queens and Manhattan, reflecting the transformative zoning that is taking place in New York City. However, Manhattan will retain the largest share of total employment. The New Jersey sub-region will add 377,000 jobs during this period, over half the number of workers to be added in New York City. Long Island will add nearly 106,000 jobs, the Mid-Hudson sub-region will add 103,000 while the Connecticut sub-region will gain roughly 77,000.

The distribution of employment throughout the region is forecasted to change little from 2020 to 2050, with the sub-regions outside of New York City decreasing in share by fractions of a percent over the thirty year period. New York City will maintain the largest share of employment with 42.9 percent in 2020 increasing to 43.8 percent by 2050 (see Figure 4).

Figure 4. Projected Draft Total Employment by Region (2010-2050)

Total Employment (000s)	2010	2015	2020	2025	2030	2035	2040	2045	2050
New York City	4,527.2	4,850.1	5,308.0	5,431.4	5,548.2	5,650.6	5,767.8	5,886.1	6,012.1
Long Island	1,227.1	1,284.9	1,345.8	1,362.5	1,381.4	1,397.3	1,415.1	1,433.2	1,451.6
Mid-Hudson	962.4	999.5	1,064.1	1,081.8	1,100.7	1,116.3	1,132.9	1,149.6	1,167.4
New Jersey	3,348.9	3,432.8	3,616.1	3,667.4	3,724.2	3,781.7	3,846.8	3,918.3	3,993.2
Connecticut	954.9	993.9	1,027.4	1,038.5	1,050.3	1,061.6	1,075.5	1,089.4	1,104.1
31-County Totals	11,020.5	11,561.2	12,361.6	12,581.6	12,804.8	13,007.5	13,238.0	13,476.6	13,728.3
Total Employment Annual Avg. Growth Rates		2010-2015	2015-2020	2020-2025	2025-2030	2030-2035	2035-2040	2040-2045	2045-2050
New York City		1.4%	1.9%	0.5%	0.4%	0.4%	0.4%	0.4%	0.4%
Long Island		0.9%	0.9%	0.2%	0.3%	0.2%	0.3%	0.3%	0.3%
Mid-Hudson		0.8%	1.3%	0.3%	0.3%	0.3%	0.3%	0.3%	0.3%
New Jersey		0.5%	1.1%	0.3%	0.3%	0.3%	0.3%	0.4%	0.4%
Connecticut		0.8%	0.7%	0.2%	0.2%	0.2%	0.3%	0.3%	0.3%
31-County Totals		1.0%	1.4%	0.4%	0.4%	0.3%	0.4%	0.4%	0.4%

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments

2.2.2 Payroll Employment

The region will see an increase of some 1.2 million payroll jobs between 2020 and 2050, as shown in Figure 5. The largest share of growth (651,000 jobs, 52.4%) will be in New York City. The New Jersey sub-region follows with the addition of 344,400 payroll jobs; Long Island with 92,600; the Mid-Hudson with 91,900; and the Connecticut sub-region with 63,300.

[3] NYMTC, *Technical Memorandum 2: Model Update to 2017 Baseline*. July 2019 pp.9-12

Figure 5. Employment Model County Outputs: 2017 Baseline Payroll Employment

	2010	2015	2017	2020	2025	2030	2035	2040	2045	2050
FORECAST REGION	**9,984,474**	**10,499,370**	**10,922,607**	**11,239,788**	**11,435,118**	**11,636,796**	**11,818,780**	**12,026,199**	**12,240,171**	**12,468,014**
Bronx County	350,114	369,453	380,251	397,680	412,988	426,779	439,294	453,439	468,301	484,407
Kings County	729,854	803,540	836,696	878,737	911,981	945,000	976,412	1,010,077	1,045,020	1,083,439
New York County	2,285,300	2,444,347	2,615,780	2,672,769	2,699,066	2,726,293	2,742,594	2,765,333	2,786,742	2,808,488
Queens County	627,836	676,755	709,476	760,011	792,160	820,332	848,820	879,807	911,099	944,815
Richmond County	114,997	125,739	127,816	132,519	136,613	140,253	143,358	147,296	151,358	155,651
NYC Total	**4,108,101**	**4,419,833**	**4,670,018**	**4,841,716**	**4,952,808**	**5,058,656**	**5,150,478**	**5,255,952**	**5,362,520**	**5,476,800**
Nassau County	528,703	548,223	564,932	577,889	589,283	600,278	610,465	620,792	630,957	641,508
Suffolk County	567,321	602,285	621,074	626,910	629,779	635,411	639,299	644,667	650,220	655,934
LI Total	**1,096,024**	**1,150,508**	**1,186,007**	**1,204,799**	**1,219,062**	**1,235,689**	**1,249,764**	**1,265,459**	**1,281,177**	**1,297,442**
Dutchess County	108,441	113,436	115,735	115,928	116,972	118,376	119,634	120,894	122,000	122,982
Orange County	139,117	141,421	145,543	149,281	151,628	154,158	156,134	158,711	161,112	163,626
Putnam County	24,397	25,749	26,182	26,513	26,848	27,179	27,371	27,616	27,890	28,160
Rockland County	101,669	109,122	115,849	119,554	122,551	125,932	128,670	131,278	133,870	136,625
Sullivan County	26,008	25,509	25,665	27,409	27,656	27,815	27,862	27,979	28,171	28,410
Ulster County	60,052	62,256	63,841	66,466	67,337	68,213	69,138	70,066	70,982	71,953
Westchester County	390,063	414,758	433,487	446,992	454,636	462,801	469,596	476,692	484,006	492,315
MH Total	**849,747**	**892,251**	**926,302**	**952,143**	**967,628**	**984,475**	**998,406**	**1,013,235**	**1,028,032**	**1,044,071**
Bergen County	411,785	421,284	430,535	440,629	447,111	454,159	461,463	469,480	478,038	486,897
Essex County	380,985	368,662	378,239	389,631	397,601	404,179	411,021	418,879	427,430	436,272
Hudson County	268,046	282,020	295,772	309,793	319,344	329,191	338,997	348,494	358,356	368,600
Hunterdon County	50,075	53,115	52,609	53,709	53,901	54,454	54,767	55,210	55,725	56,608
Mercer County	232,113	237,319	232,745	246,581	248,182	251,276	254,577	258,341	263,073	268,554
Middlesex County	375,008	388,309	401,397	409,098	412,606	418,393	424,993	432,083	439,707	447,740
Monmouth County	260,900	262,372	269,132	276,216	276,993	278,827	281,275	285,400	290,157	295,450
Morris County	275,776	291,622	299,863	306,313	309,068	312,375	314,411	317,348	320,928	324,949
Ocean County	161,242	166,005	175,778	178,542	182,484	186,066	189,242	193,249	197,049	200,431
Passaic County	183,961	181,477	183,759	189,633	191,553	194,240	196,866	200,067	203,727	207,713
Somerset County	167,848	185,400	191,860	193,473	195,651	198,537	201,643	205,126	209,000	212,999
Sussex County	41,274	41,935	43,551	44,388	44,550	44,754	44,984	45,337	46,163	47,077
Union County	230,920	233,011	241,763	247,738	252,346	256,896	261,307	265,597	270,099	274,669
Warren County	36,023	35,247	35,627	36,586	36,794	37,282	37,831	38,527	39,119	39,616
NJ Total	**3,075,956**	**3,147,777**	**3,232,629**	**3,322,330**	**3,368,185**	**3,420,628**	**3,473,378**	**3,533,140**	**3,598,571**	**3,667,576**
Fairfield County	425,358	445,415	455,870	461,616	466,566	471,605	476,413	482,057	487,627	493,564
Litchfield County	57,000	62,296	63,094	63,718	63,811	63,994	64,204	64,539	64,871	65,250
New Haven County	372,288	381,290	388,687	393,466	397,056	401,749	406,136	411,817	417,373	423,311
CT Total	**854,646**	**889,001**	**907,651**	**918,800**	**927,434**	**937,348**	**946,753**	**958,413**	**969,871**	**982,124**

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments

Growth trends by industry in the 31-County NYMTC Region are detailed in Figure 6. The Region's strongest growth is projected to be located in industries with high levels of national growth, primarily industries driven by consumer demand and protected from automation or outsourcing, as well as those industries where the region has a competitive edge over the nation as a whole and serve regional, national or global demand. The region exhibits a competitive advantage in professional, scientific, and technical services, education services, accommodations and food services. Growth in health care and social assistance, administrative, support and waste management, and construction are largely driven by local demand although supported by national growth and stable labor productivity with little risk from outsourcing or automation.

The 2050 Forecast update projects sharper growth in the sectors of accommodation and food services, administrative, support and waste management, government, management of companies and enterprises, professional, scientific and technical services, and retail trade.

Regionally, the manufacturing industry is expected to continue losing jobs on the scale of 3,600 per year throughout the forecast period.

Figure 6. Projected Baseline Payroll Employment Growth by Industry, 31-County Region

NAICS Industry	Levels		Avg. Annual Change, 20107-2050		Industry % of Total Growth
	2017	2050	Levels	%	
11-Agriculture	16,547	21,712	156	0.9%	0.3%
21-Mining	2,855	4,559	52	1.8%	0.1%
22-Utilities	44,827	45,545	22	0.0%	0.0%
23-Construction	434,631	562,239	3,867	0.9%	8.3%
31-33-Manufacturing	501,885	384,527	-3,556	-0.7%	-7.6%
42-Wholesale Trade	465,129	460,205	-149	0.0%	-0.3%
44-45-Retail Trade	1,104,156	1,120,653	500	0.0%	1.1%
48-49-Transportation & Warehousing	337,444	359,913	681	0.2%	1.5%
51-Information	316,808	325,861	274	0.1%	0.6%
52-Finance & Insurance	620,595	645,109	743	0.1%	1.6%
53-Real Estate, Rental & Leasing	231,513	207,111	-739	-0.3%	-1.6%
54-Professional, Scientific & Technical	836,351	1,052,468	6,549	0.8%	14.0%
55-Management Of Companies & Enterprises	188,152	253,267	1,973	1.0%	4.2%
56-Administrative, Support, Waste Management	655,618	945,152	8,774	1.3%	18.7%
61-Educational Services	450,147	608,482	4,798	1.1%	10.2%
62-Health Care & Social Assistance	1,595,567	1,953,747	10,854	0.7%	23.2%
71-Arts, Entertainment & Recreation	198,647	209,217	320	0.2%	0.7%
72-Accommodation & Food Services	830,296	1,029,088	6,024	0.7%	12.9%
81-Other Services	551,600	598,471	1,420	0.3%	3.0%
92-Government	1,539,839	1,680,689	4,268	0.3%	9.1%
Total-All Industries	**10,922,607**	**12,468,014**	**46,831**	**0.4%**	**100.0%**

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments

2.2.3 Self-Employment

As shown in Figure 7, self-employment is expected to increase by 138,500 workers regionally between 2020 and 2050. The largest number of these will be in New York City (69,000), followed by the New Jersey sub-region (31,800). The Connecticut sub-region and Long Island will see their self-employed jobs grow by some 13,000 from 2020 to 2050, while the Mid-Hudson sub-region will see only 11,400 new self-employed jobs in that period.

Figure 7. Employment Model County Outputs: 2017 Baseline Self-Employment

	2010	2015	2017	2020	2025	2030	2035	2040	2045	2050
FORECAST REGION	**1,036,056**	**1,061,853**	**1,085,874**	**1,121,771**	**1,146,532**	**1,168,027**	**1,188,755**	**1,211,843**	**1,236,401**	**1,260,309**
Bronx County	30,383	31,602	32,935	33,936	35,104	36,147	37,153	38,294	39,486	40,723
Kings County	93,135	99,173	103,865	107,803	111,674	115,293	119,090	123,111	127,356	131,779
New York County	203,307	209,918	216,677	225,133	228,864	232,257	234,721	237,548	240,272	242,624
Queens County	81,032	76,867	78,257	86,287	89,491	92,179	95,239	98,615	101,914	105,223
Richmond County	11,271	12,733	12,872	13,156	13,464	13,715	13,934	14,236	14,578	14,926
NYC Total	**419,128**	**430,293**	**444,606**	**466,314**	**478,597**	**489,591**	**500,136**	**511,805**	**523,606**	**535,275**
Nassau County	61,880	65,196	66,329	68,276	69,958	71,481	72,882	74,312	75,827	77,266
Suffolk County	69,244	69,223	71,353	72,774	73,463	74,194	74,679	75,333	76,173	76,847
LI Total	**131,124**	**134,419**	**137,682**	**141,050**	**143,421**	**145,675**	**147,561**	**149,645**	**152,000**	**154,113**
Dutchess County	12,846	12,227	11,905	12,167	12,390	12,608	12,788	12,974	13,160	13,289
Orange County	11,764	13,373	13,034	13,232	13,454	13,661	13,833	14,038	14,271	14,455
Putnam County	4,042	3,676	3,723	3,859	3,890	3,910	3,914	3,932	3,960	3,985
Rockland County	14,869	13,223	13,461	14,180	14,583	15,021	15,367	15,705	16,059	16,396
Sullivan County	3,569	3,164	3,382	3,310	3,354	3,379	3,385	3,397	3,416	3,429
Ulster County	10,681	9,396	9,429	10,047	10,235	10,368	10,497	10,631	10,777	10,919
Westchester County	54,873	52,150	52,360	55,178	56,269	57,256	58,109	58,971	59,918	60,850
MH Total	**112,644**	**107,209**	**107,294**	**111,973**	**114,176**	**116,202**	**117,894**	**119,650**	**121,560**	**123,323**
Bergen County	43,015	47,362	46,858	47,714	48,573	49,351	50,193	51,063	52,017	52,940
Essex County	29,803	29,896	31,672	31,134	32,035	32,624	33,308	34,042	34,909	35,775
Hudson County	20,969	20,843	20,753	22,003	22,654	23,248	23,875	24,445	25,077	25,707
Hunterdon County	6,186	7,672	7,473	7,661	7,766	7,850	7,894	7,923	7,959	8,044
Mercer County	15,181	13,727	13,660	15,054	15,174	15,327	15,521	15,748	16,031	16,344
Middlesex County	24,252	28,031	29,310	28,633	29,033	29,425	29,906	30,463	31,084	31,687
Monmouth County	26,879	28,452	28,118	29,559	29,786	29,959	30,241	30,716	31,257	31,800
Morris County	25,085	26,298	26,615	26,390	26,871	27,213	27,488	27,789	28,184	28,567
Ocean County	19,797	21,191	21,943	22,251	22,827	23,150	23,458	23,926	24,409	24,791
Passaic County	16,629	16,269	17,065	17,033	17,233	17,429	17,656	17,902	18,206	18,498
Somerset County	14,933	14,096	14,625	14,605	14,926	15,205	15,483	15,802	16,166	16,516
Sussex County	6,913	6,110	5,653	6,267	6,324	6,316	6,348	6,372	6,469	6,570
Union County	19,288	20,912	21,678	21,536	22,066	22,482	22,896	23,297	23,738	24,155
Warren County	4,021	4,150	3,959	3,974	3,992	4,026	4,077	4,143	4,204	4,254
NJ Total	**272,952**	**285,009**	**289,382**	**293,814**	**299,261**	**303,605**	**308,345**	**313,631**	**319,709**	**325,646**
Fairfield County	56,537	58,260	59,588	60,347	61,827	62,929	63,959	65,205	66,535	67,858
Litchfield County	11,609	11,339	10,379	11,430	11,608	11,709	11,849	12,020	12,195	12,329
New Haven County	32,062	35,324	36,943	36,843	37,642	38,316	39,010	39,886	40,796	41,766
CT Total	**100,208**	**104,923**	**106,910**	**108,620**	**111,077**	**112,954**	**114,819**	**117,111**	**119,526**	**121,953**

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments

Trends in the self-employed forecast, which includes proprietors and self-employed and unpaid family workers are similar to the total employment forecast with the share of self-employment to total employment remaining stable at roughly nine percent from 2010 through 2050 as shown in Figure 8. The distribution of self-employed workers by place of work differs marginally from payroll employment. In 2017, 40.9 percent of self-employed workers were located in New York City compared with 42.8 percent of payroll workers. This ratio is forecast to gradually increase to 42.5 percent for self-employed workers and to 43.9 percent for payroll employees by 2050.

Figure 8. Projected Baseline Self-Employment by Region (2010-2050)

Self-Employment	2010	2015	2020	2025	2030	2035	2040	2045	2050
New York City	419,128	430,293	466,314	478,597	489,591	500,136	511,805	523,606	535,275
Long Island	131,124	134,419	141,050	143,421	145,675	147,561	149,645	152,000	154,113
Mid-Hudson	112,644	107,209	111,973	114,176	116,202	117,894	119,650	121,560	123,323
New Jersey	272,952	285,009	293,814	299,261	303,605	308,345	313,631	319,709	325,646
Connecticut	100,208	104,923	108,620	111,077	112,954	114,819	117,111	119,526	121,953
31-County Totals	**1,036,056**	**1,061,853**	**1,121,771**	**1,146,532**	**1,168,027**	**1,188,755**	**1,211,843**	**1,236,401**	**1,260,309**

Self-Employment Rates	2010	2015	2020	2025	2030	2035	2040	2045	2050
New York City	9.3%	8.9%	8.8%	8.8%	8.8%	8.9%	8.9%	8.9%	8.9%
Long Island	10.7%	10.5%	10.5%	10.5%	10.5%	10.6%	10.6%	10.6%	10.6%
Mid-Hudson	11.7%	10.7%	10.5%	10.6%	10.6%	10.6%	10.6%	10.6%	10.6%
New Jersey	8.2%	8.3%	8.1%	8.2%	8.2%	8.2%	8.2%	8.2%	8.2%
Connecticut	10.5%	10.6%	10.6%	10.7%	10.8%	10.8%	10.9%	11.0%	11.0%
31-County Totals	**9.4%**	**9.2%**	**9.1%**	**9.1%**	**9.1%**	**9.1%**	**9.2%**	**9.2%**	**9.2%**

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments

The ratio of self-employment to total employment is projected to remain at roughly 9 percent throughout the 2010-2050 period. New York City is expected to maintain an 8.7 percent self-employment rate, higher only than the New Jersey sub-region (8.1%). New York workers outside of the urban core of the City, as well as those in Connecticut have much higher rates of self-employment at 10.6 percent and 11.0 percent, respectively.

2.3 Alternative Model Outputs

As noted in the introduction, the Port Authority put forth an alternative forecast, which balances the share of growth among the sub-regions. Figure 9 on the following page presents this alternative forecast.

2.3.1 Total Employment

In this scenario, regional employment as a whole is expected to grow at a rate of 0.41 percent per year from 2020 to 2050, coming to a total of 13.9 million jobs or 200,000 more than in the Draft Baseline scenario.

In this scenario, New York City will retain the majority of regional growth at 51.8 percent, a slightly higher share than in the Draft Baseline. New Jersey follows with the next highest share, although its share of growth between 2020 and 2050 will decline slightly from 27.6 percent to 24.7 percent as its total number of jobs remains constant in the two scenarios. Long Island, as well as the Mid-Hudson and Connecticut sub-regions will see increased shares of employment growth in this scenario. Long Island in this scenario would see almost 40,000 additional jobs in the 2050 forecast year, increasing its share from 7.7 percent to 9.0 percent. The Mid-Hudson sub-region would gain an additional 24,000 jobs, primarily in Westchester County; its respective share of total growth increasing from 7.6 percent to 8.1 percent. Finally, the Connecticut sub-region would see 6.5 percent of total regional growth from 2020 to 2050, an addition of 27,000 jobs over the Draft Baseline.

In order to establish the cross-Hudson balance, Manhattan employment was lowered with the agreement and input of DCP. For other New York counties that had been experiencing recent

employment growth input from the FWG indicated that employment would be limited by land use capacity particularly in the Mid-Hudson sub-region.

Figure 9. Alternative Total Employment

	2010	2015	2017	2020	2025	2030	2035	2040	2045	2050
FORECAST REGION	**11,020,530**	**11,561,224**	**12,008,481**	**12,386,749**	**12,628,200**	**12,880,997**	**13,108,831**	**13,364,542**	**13,630,178**	**13,910,913**
Bronx County	380,497	401,055	413,186	425,524	435,131	444,329	452,799	462,028	471,040	480,209
Kings County	822,989	902,713	940,561	970,395	992,983	1,015,914	1,038,088	1,061,121	1,084,025	1,108,443
New York County	2,488,607	2,654,265	2,832,457	2,949,764	3,027,343	3,110,163	3,175,913	3,251,198	3,328,935	3,411,168
Queens County	708,868	753,622	787,733	827,190	848,557	866,763	886,031	906,882	927,394	949,377
Richmond County	126,268	138,472	140,688	143,226	145,648	147,655	149,289	151,593	153,812	155,979
NYC Total	**4,527,230**	**4,850,126**	**5,114,624**	**5,316,099**	**5,449,662**	**5,584,824**	**5,702,121**	**5,832,821**	**5,965,206**	**6,105,176**
Nassau County	590,583	613,419	631,261	651,411	667,641	683,356	697,857	712,968	728,503	744,933
Suffolk County	636,565	671,508	692,427	702,483	707,506	715,419	721,218	728,885	737,118	745,592
LI Total	**1,227,148**	**1,284,927**	**1,323,689**	**1,353,894**	**1,375,147**	**1,398,775**	**1,419,075**	**1,441,853**	**1,465,621**	**1,490,526**
Dutchess County	121,287	125,663	127,640	128,689	130,422	132,463	134,252	136,112	137,879	139,542
Orange County	150,881	154,794	158,577	162,513	165,083	167,819	169,967	172,749	175,383	178,080
Putnam County	28,439	29,425	29,905	30,528	30,999	31,453	31,748	32,115	32,525	32,935
Rockland County	116,538	122,345	129,310	133,734	137,134	140,953	144,038	146,983	149,929	153,021
Sullivan County	29,577	28,673	29,047	30,719	31,010	31,194	31,247	31,377	31,587	31,839
Ulster County	70,732	71,652	73,270	76,514	77,572	78,581	79,635	80,697	81,759	82,873
Westchester County	444,936	466,908	485,847	505,581	517,066	528,883	538,852	549,430	560,537	572,975
MH Total	**962,390**	**999,460**	**1,033,596**	**1,068,278**	**1,089,286**	**1,111,346**	**1,129,738**	**1,149,463**	**1,169,600**	**1,191,266**
Bergen County	454,800	468,646	477,393	488,344	495,683	503,510	511,656	520,543	530,055	539,837
Essex County	410,788	398,558	409,911	420,764	429,635	436,804	444,330	452,921	462,338	472,047
Hudson County	289,015	302,863	316,525	331,796	341,998	352,439	362,872	372,939	383,433	394,307
Hunterdon County	56,262	60,787	60,082	61,371	61,667	62,304	62,661	63,133	63,683	64,652
Mercer County	247,294	251,046	246,405	261,635	263,356	266,603	270,098	274,090	279,104	284,898
Middlesex County	399,260	416,340	430,707	437,732	441,640	447,818	454,899	462,546	470,791	479,427
Monmouth County	287,779	290,824	297,250	305,774	306,780	308,786	311,517	316,117	321,414	327,250
Morris County	300,861	317,920	326,478	332,703	335,939	339,588	341,899	345,137	349,112	353,516
Ocean County	181,039	187,196	197,721	200,792	205,310	209,216	212,700	217,175	221,458	225,222
Passaic County	200,590	197,746	200,824	206,666	208,786	211,669	214,522	217,969	221,934	226,211
Somerset County	182,781	199,496	206,485	208,078	210,578	213,741	217,126	220,928	225,166	229,514
Sussex County	48,187	48,045	49,204	50,655	50,875	51,069	51,333	51,710	52,632	53,647
Union County	250,208	253,923	263,441	269,275	274,412	279,378	284,203	288,894	293,836	298,824
Warren County	40,045	39,397	39,586	40,560	40,787	41,308	41,909	42,671	43,323	43,870
NJ Total	**3,348,908**	**3,432,786**	**3,522,011**	**3,616,145**	**3,667,446**	**3,724,233**	**3,781,724**	**3,846,771**	**3,918,279**	**3,993,222**
Fairfield County	481,896	503,675	515,458	524,263	532,307	540,197	547,689	556,404	565,281	574,767
Litchfield County	68,609	73,635	73,473	75,398	75,806	76,226	76,696	77,341	78,007	78,697
New Haven County	404,350	416,614	425,629	432,672	438,544	445,395	451,788	459,890	468,184	477,260
CT Total	**954,854**	**993,924**	**1,014,561**	**1,032,333**	**1,046,657**	**1,061,819**	**1,076,174**	**1,093,635**	**1,111,472**	**1,130,724**

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments, Port Authority of NY and NJ

2.3.2 Payroll Employment

In this scenario, the region will see an increase of some 1.4 million payroll jobs between 2020 and 2050. Growth follows the Total Employment for the scenario, with the overall distribution of following the same pattern as the seen in the Draft Baseline.

Figure 10. Alternative Payroll Employment

	2010	2015	2017	2020	2025	2030	2035	2040	2045	2050
FORECAST REGION	**9,984,474**	**10,499,370**	**10,922,607**	**11,263,722**	**11,479,721**	**11,709,993**	**11,916,129**	**12,147,827**	**12,387,664**	**12,643,080**
Bronx County	350,114	369,453	380,251	392,158	401,135	409,729	417,616	426,231	434,638	443,245
Kings County	729,854	803,540	836,696	864,690	885,052	905,878	925,795	946,525	967,056	989,131
New York County	2,285,300	2,444,347	2,615,780	2,720,059	2,790,366	2,866,312	2,926,190	2,994,925	3,065,905	3,141,472
Queens County	627,836	676,755	709,476	743,439	763,223	780,211	797,881	816,956	835,691	855,910
Richmond County	114,997	125,739	127,816	130,374	132,699	134,654	136,258	138,463	140,564	142,628
NYC Total	**4,108,101**	**4,419,833**	**4,670,018**	**4,850,721**	**4,972,474**	**5,096,784**	**5,203,740**	**5,323,100**	**5,443,855**	**5,572,387**
Nassau County	528,703	548,223	564,932	582,470	596,706	610,588	623,377	636,711	650,324	664,844
Suffolk County	567,321	602,285	621,074	629,317	633,497	640,511	645,655	652,488	659,676	667,241
LI Total	**1,096,024**	**1,150,508**	**1,186,007**	**1,211,787**	**1,230,204**	**1,251,099**	**1,269,033**	**1,289,199**	**1,310,001**	**1,332,085**
Dutchess County	108,441	113,436	115,735	116,446	117,920	119,708	121,284	122,922	124,462	125,949
Orange County	139,117	141,421	145,543	149,281	151,628	154,158	156,134	158,711	161,112	163,626
Putnam County	24,397	25,749	26,182	26,643	27,068	27,487	27,761	28,094	28,459	28,828
Rockland County	101,669	109,122	115,849	119,554	122,551	125,932	128,670	131,278	133,870	136,625
Sullivan County	26,008	25,509	25,665	27,409	27,656	27,815	27,862	27,979	28,171	28,410
Ulster County	60,052	62,256	63,841	66,466	67,337	68,213	69,138	70,066	70,982	71,953
Westchester County	390,063	414,758	433,487	449,980	460,067	470,619	479,464	488,893	498,746	509,906
MH Total	**849,747**	**892,251**	**926,302**	**955,780**	**974,228**	**993,932**	**1,010,313**	**1,027,943**	**1,045,804**	**1,065,298**
Bergen County	411,785	421,284	430,535	440,629	447,111	454,159	461,463	469,480	478,038	486,897
Essex County	380,985	368,662	378,239	389,631	397,601	404,179	411,021	418,879	427,430	436,272
Hudson County	268,046	282,020	295,772	309,793	319,344	329,191	338,997	348,494	358,356	368,600
Hunterdon County	50,075	53,115	52,609	53,709	53,901	54,454	54,767	55,210	55,725	56,608
Mercer County	232,113	237,319	232,745	246,581	248,182	251,276	254,577	258,341	263,073	268,554
Middlesex County	375,008	388,309	401,397	409,098	412,606	418,393	424,993	432,083	439,707	447,740
Monmouth County	260,900	262,372	269,132	276,216	276,993	278,827	281,275	285,400	290,157	295,450
Morris County	275,776	291,622	299,863	306,313	309,068	312,375	314,411	317,348	320,928	324,949
Ocean County	161,242	166,005	175,778	178,542	182,484	186,066	189,242	193,249	197,049	200,431
Passaic County	183,961	181,477	183,759	189,633	191,553	194,240	196,866	200,067	203,727	207,713
Somerset County	167,848	185,400	191,860	193,473	195,651	198,537	201,643	205,126	209,000	212,999
Sussex County	41,274	41,935	43,551	44,388	44,550	44,754	44,984	45,337	46,163	47,077
Union County	230,920	233,011	241,763	247,738	252,346	256,896	261,307	265,597	270,099	274,669
Warren County	36,023	35,247	35,627	36,586	36,794	37,282	37,831	38,527	39,119	39,616
NJ Total	**3,075,956**	**3,147,777**	**3,232,629**	**3,322,330**	**3,368,185**	**3,420,628**	**3,473,378**	**3,533,140**	**3,598,571**	**3,667,576**
Fairfield County	425,358	445,415	455,870	463,584	469,950	476,523	482,763	490,004	497,302	505,170
Litchfield County	57,000	62,296	63,094	63,919	64,128	64,427	64,736	65,188	65,655	66,184
New Haven County	372,288	381,290	388,687	395,601	400,552	406,599	412,165	419,253	426,476	434,380
CT Total	**854,646**	**889,001**	**907,651**	**923,104**	**934,630**	**947,549**	**959,664**	**974,445**	**989,433**	**1,005,734**

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments, Port Authority of NY and NJ

Growth trends by industry for the Alternative scenario are shown in Figure 11. The redistribution of growth among the sub-regions results in lesser shares of growth in some of the highest growth categories including health care & social assistance; administrative, support & waste management; as well as accommodations & food services. Conversely, professional, scientific & technical services and educational services increase in share, while the declines in manufacturing and wholesale trade lessen.

Figure 11. Alternative Payroll Employment by Industry

NAICS Industry	Levels		Avg. Annual Change, 20107-2050		Industry % of Total Growth
	2017	2050	Levels	%	
11-Agriculture	16,547	22,155	170	1.0%	0.3%
21-Mining	2,855	4,711	56	2.0%	0.1%
22-Utilities	44,827	47,079	68	0.2%	0.1%
23-Construction	434,631	578,869	4,371	1.0%	8.4%
31-33-Manufacturing	501,885	387,772	-3,458	-0.7%	-6.6%
42-Wholesale Trade	465,129	461,057	-123	0.0%	-0.2%
44-45-Retail Trade	1,104,156	1,123,599	589	0.1%	1.1%
48-49-Transportation & Warehousing	337,444	355,829	557	0.2%	1.1%
51-Information	316,808	334,942	550	0.2%	1.1%
52-Finance & Insurance	620,595	680,285	1,809	0.3%	3.5%
53-Real Estate, Rental & Leasing	231,513	209,541	-666	-0.3%	-1.3%
54-Professional, Scientific & Technical	836,351	1,083,383	7,486	0.9%	14.4%
55-Management Of Companies & Enterprises	188,152	276,660	2,682	1.4%	5.1%
56-Administrative, Support, Waste Management	655,618	963,428	9,328	1.4%	17.9%
61-Educational Services	450,147	638,221	5,699	1.3%	10.9%
62-Health Care & Social Assistance	1,595,567	1,945,675	10,609	0.7%	20.3%
71-Arts, Entertainment & Recreation	198,647	211,740	397	0.2%	0.8%
72-Accommodation & Food Services	830,296	1,040,442	6,368	0.8%	12.2%
81-Other Services	551,600	600,662	1,487	0.3%	2.9%
92-Government	1,539,839	1,677,027	4,157	0.3%	8.0%
Total-All Industries	**10,922,607**	**12,643,080**	**52,136**	**0.5%**	**100.0%**

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments, Port Authority of NY and NJ

A comparison of industry employment at the county level for both the Draft Baseline and Alternative scenarios can be found in Appendix A.

2.3.3 Self-Employment

The Self Employment forecasts using the Alternative scenario are shown in Figure 12. As noted in Section 2.2.3, the distribution of self-employed workers by place of work differs marginally from payroll employment. The self-employment rates by sub-region remain unchanged from the Draft Baseline version of the model.

Figure 12. Alternative Self Employment

	2010	2015	2017	2020	2025	2030	2035	2040	2045	2050
FORECAST REGION	**1,036,056**	**1,061,853**	**1,085,874**	**1,123,027**	**1,148,478**	**1,171,004**	**1,192,702**	**1,216,715**	**1,242,514**	**1,267,833**
Bronx County	30,383	31,602	32,935	33,366	33,996	34,600	35,183	35,796	36,402	36,963
Kings County	93,135	99,173	103,865	105,706	107,931	110,036	112,293	114,596	116,969	119,312
New York County	203,307	209,918	216,677	229,705	236,977	243,851	249,722	256,273	263,029	269,696
Queens County	81,032	76,867	78,257	83,750	85,334	86,552	88,151	89,926	91,703	93,467
Richmond County	11,271	12,733	12,872	12,851	12,950	13,001	13,031	13,129	13,248	13,351
NYC Total	**419,128**	**430,293**	**444,606**	**465,378**	**477,188**	**488,040**	**498,381**	**509,720**	**521,351**	**532,789**
Nassau County	61,880	65,196	66,329	68,941	70,935	72,768	74,480	76,257	78,178	80,090
Suffolk County	69,244	69,223	71,353	73,166	74,009	74,908	75,562	76,397	77,442	78,351
LI Total	**131,124**	**134,419**	**137,682**	**142,107**	**144,944**	**147,676**	**150,042**	**152,654**	**155,620**	**158,441**
Dutchess County	12,846	12,227	11,905	12,243	12,503	12,754	12,967	13,190	13,417	13,593
Orange County	11,764	13,373	13,034	13,232	13,454	13,661	13,833	14,038	14,271	14,455
Putnam County	4,042	3,676	3,723	3,885	3,931	3,966	3,987	4,021	4,065	4,107
Rockland County	14,869	13,223	13,461	14,180	14,583	15,021	15,367	15,705	16,059	16,396
Sullivan County	3,569	3,164	3,382	3,310	3,354	3,379	3,385	3,397	3,416	3,429
Ulster County	10,681	9,396	9,429	10,047	10,235	10,368	10,497	10,631	10,777	10,919
Westchester County	54,873	52,150	52,360	55,601	56,999	58,264	59,388	60,537	61,791	63,069
MH Total	**112,644**	**107,209**	**107,294**	**112,498**	**115,059**	**117,414**	**119,424**	**121,520**	**123,796**	**125,968**
Bergen County	43,015	47,362	46,858	47,714	48,573	49,351	50,193	51,063	52,017	52,940
Essex County	29,803	29,896	31,672	31,134	32,035	32,624	33,308	34,042	34,909	35,775
Hudson County	20,969	20,843	20,753	22,003	22,654	23,248	23,875	24,445	25,077	25,707
Hunterdon County	6,186	7,672	7,473	7,661	7,766	7,850	7,894	7,923	7,959	8,044
Mercer County	15,181	13,727	13,660	15,054	15,174	15,327	15,521	15,748	16,031	16,344
Middlesex County	24,252	28,031	29,310	28,633	29,033	29,425	29,906	30,463	31,084	31,687
Monmouth County	26,879	28,452	28,118	29,559	29,786	29,959	30,241	30,716	31,257	31,800
Morris County	25,085	26,298	26,615	26,390	26,871	27,213	27,488	27,789	28,184	28,567
Ocean County	19,797	21,191	21,943	22,251	22,827	23,150	23,458	23,926	24,409	24,791
Passaic County	16,629	16,269	17,065	17,033	17,233	17,429	17,656	17,902	18,206	18,498
Somerset County	14,933	14,096	14,625	14,605	14,926	15,205	15,483	15,802	16,166	16,516
Sussex County	6,913	6,110	5,653	6,267	6,324	6,316	6,348	6,372	6,469	6,570
Union County	19,288	20,912	21,678	21,536	22,066	22,482	22,896	23,297	23,738	24,155
Warren County	4,021	4,150	3,959	3,974	3,992	4,026	4,077	4,143	4,204	4,254
NJ Total	**272,952**	**285,009**	**289,382**	**293,814**	**299,261**	**303,605**	**308,345**	**313,631**	**319,709**	**325,646**
Fairfield County	56,537	58,260	59,588	60,679	62,358	63,674	64,926	66,400	67,979	69,596
Litchfield County	11,609	11,339	10,379	11,479	11,678	11,799	11,961	12,152	12,352	12,513
New Haven County	32,062	35,324	36,943	37,071	37,991	38,796	39,623	40,637	41,707	42,880
CT Total	**100,208**	**104,923**	**106,910**	**109,229**	**112,027**	**114,269**	**116,510**	**119,189**	**122,039**	**124,990**

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments, Port Authority of NY and NJ

2.3.4 Comparison of Draft Baseline and Alternative Forecasts

Figure 13 presents a direct comparison of the 2020 and 2050 forecast years of employment for the Draft Baseline (DB) and Alternative scenario (AS) at the regional level. The county by county figures can be found in Appendix C.

Figure 13. Sub-Regional Comparison of Draft Baseline and Alternative Employment

Sub-Region	Employment		2020-2050		Sub-region
	2020	2050	Number	%	% of Region
Region DB	12,361,559	13,728,323	45,559	0.4%	100.0%
Region AS	12,386,749	13,910,913	50,805	0.4%	100.0%
NYC DB	5,308,030	6,012,076	23,468	0.4%	43.8%
NYC AS	5,316,099	6,105,176	26,303	0.5%	43.9%
LI DB	1,345,849	1,451,554	3,523	0.3%	10.6%
LI AS	1,353,894	1,490,526	4,554	0.3%	10.7%
MH DB	1,064,116	1,167,394	3,443	0.3%	8.5%
MH AS	1,068,278	1,191,266	4,100	0.4%	8.6%
NJ DB	3,616,145	3,993,222	12,569	0.3%	29.1%
NJ AS	3,616,145	3,993,222	12,569	0.3%	28.7%
CT DB	1,027,419	1,104,077	2,555	0.2%	8.0%
CT AS	1,032,333	1,130,724	3,280	0.3%	8.1%

Source: Bureau of Labor Statistics' Current Employment Statistics (CES) and Quarterly Census of Employment and Wages (QCEW); American Community Survey (ACS); NYMTC 2050 SED Forecasts; FWG Adjustments, Port Authority of NY and NJ

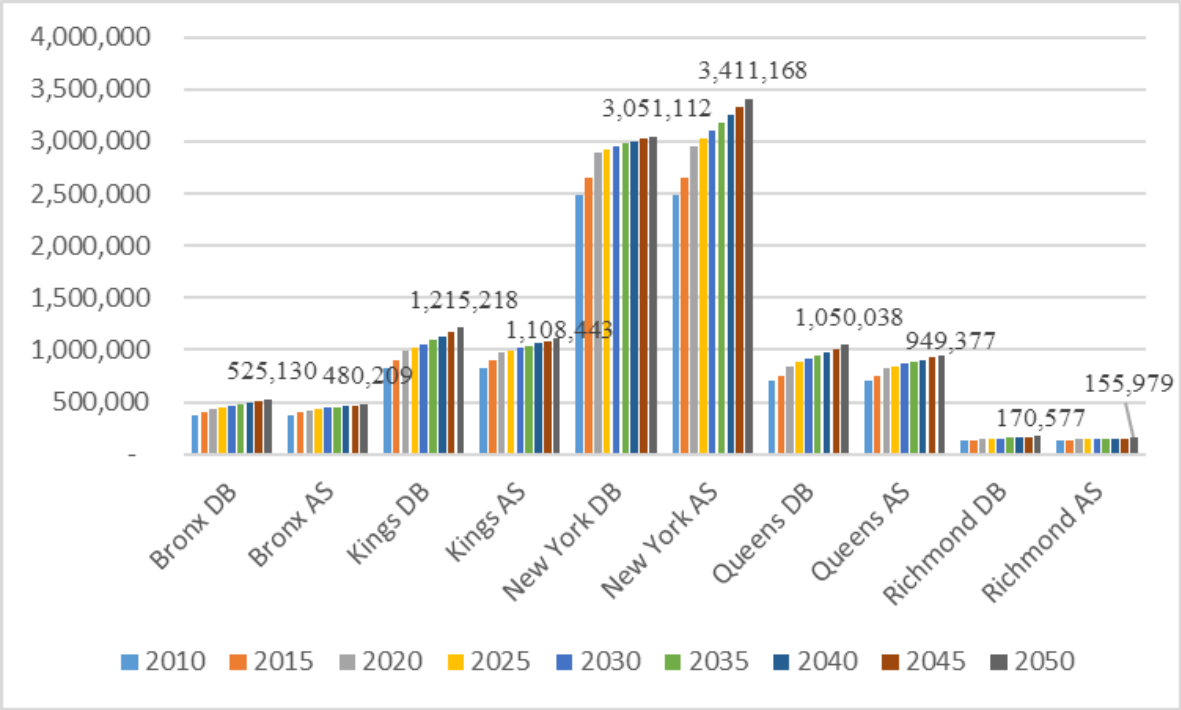
2.4 Draft Baseline and Alternative County Comparisons

2.4.1 New York City

In New York City, the Alternative scenario adds an additional 93,000 jobs to the sub-region by 2050. It also shifts growth to Manhattan in contrast to the Draft Baseline, which shows stronger growth in the Outer Boroughs as shown in Figure 14.[4]

[4] The adjustments to the employment model, to create the alternative scenario redistributed New York City employment, producing a larger share in Manhattan. In the final version of the model, a larger share of employment growth was shifted back to the outer boroughs from Manhattan.

Figure 14. Comparative Employment Forecasts by County: NYC

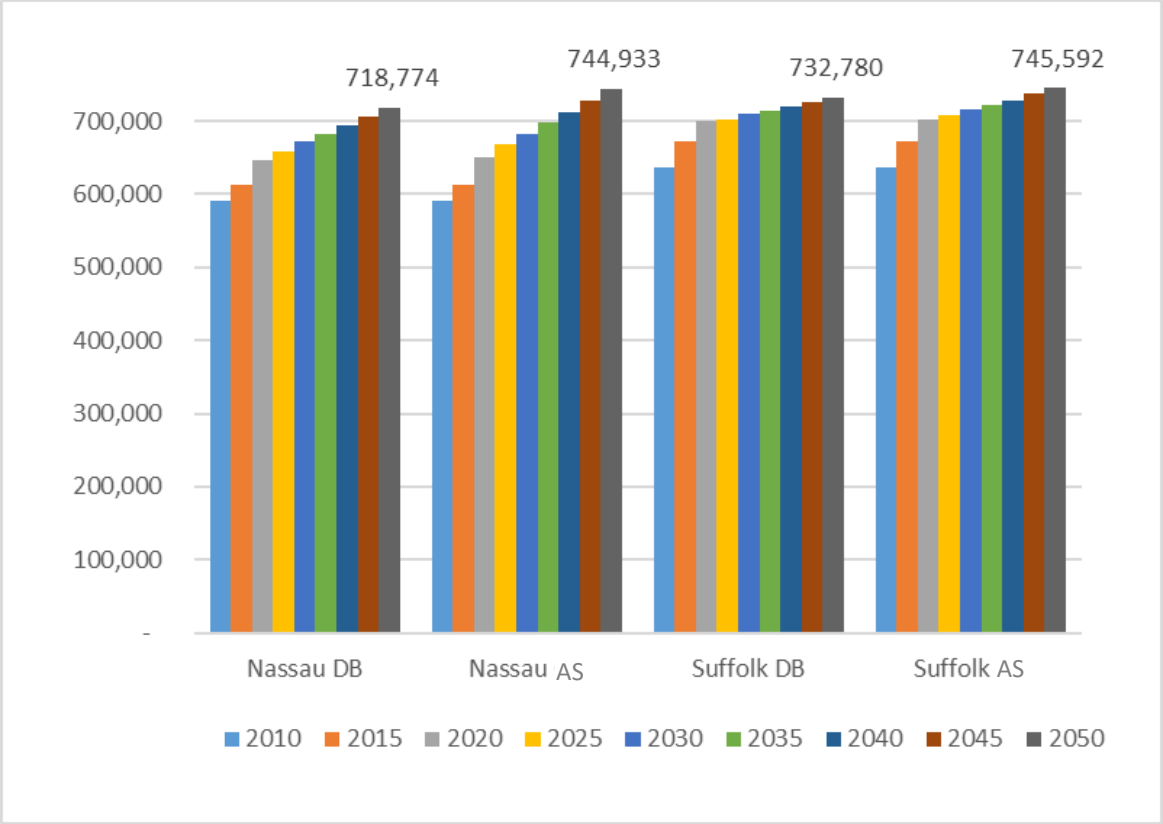


Source: NYMTC SEDS Update Employment Models Draft Baseline and Alternative scenarios run 12/20/2019.

2.4.2 Long Island

The Alternative adds employment growth to Long Island, with an additional 26,000 and 13,000 jobs going to Nassau and Suffolk counties, respectively (see Figure 15).

Figure 15. Comparative Employment Forecasts by County: Long Island

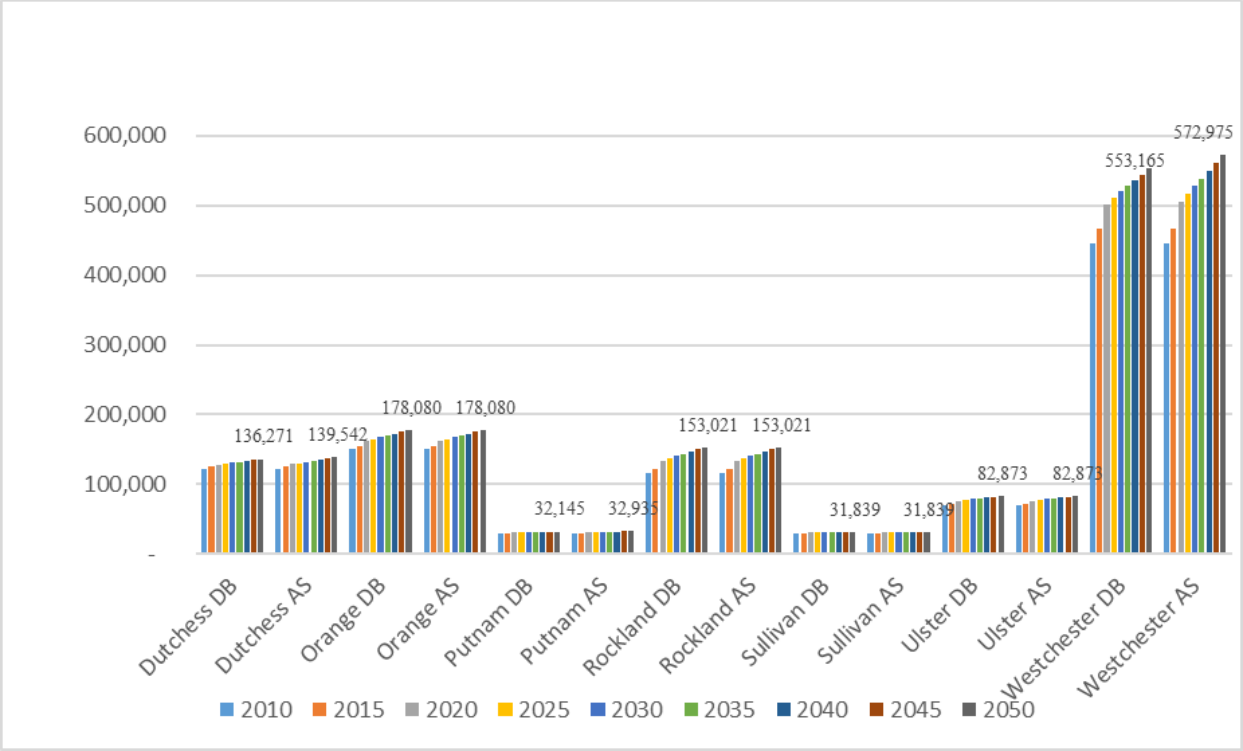


Source: NYMTC SEDS Update Employment Models Draft Baseline and Alternative scenarios run 12/20/2019.

2.4.3 Mid-Hudson

The assumptions in Alternative scenario increases the Mid-Hudson's employment by just under 24,000 in the year 2050. As shown in Figure 16, while small amounts of this increase are in Dutchess and Putnam counties, the majority of additional growth is seen in Westchester, with a further 20,000 jobs.

Figure 16. Comparative Employment Forecasts by County: Mid-Hudson



Source: NYMTC SEDS Update Employment Models Draft Baseline and Alternative scenarios run 12/20/2019.

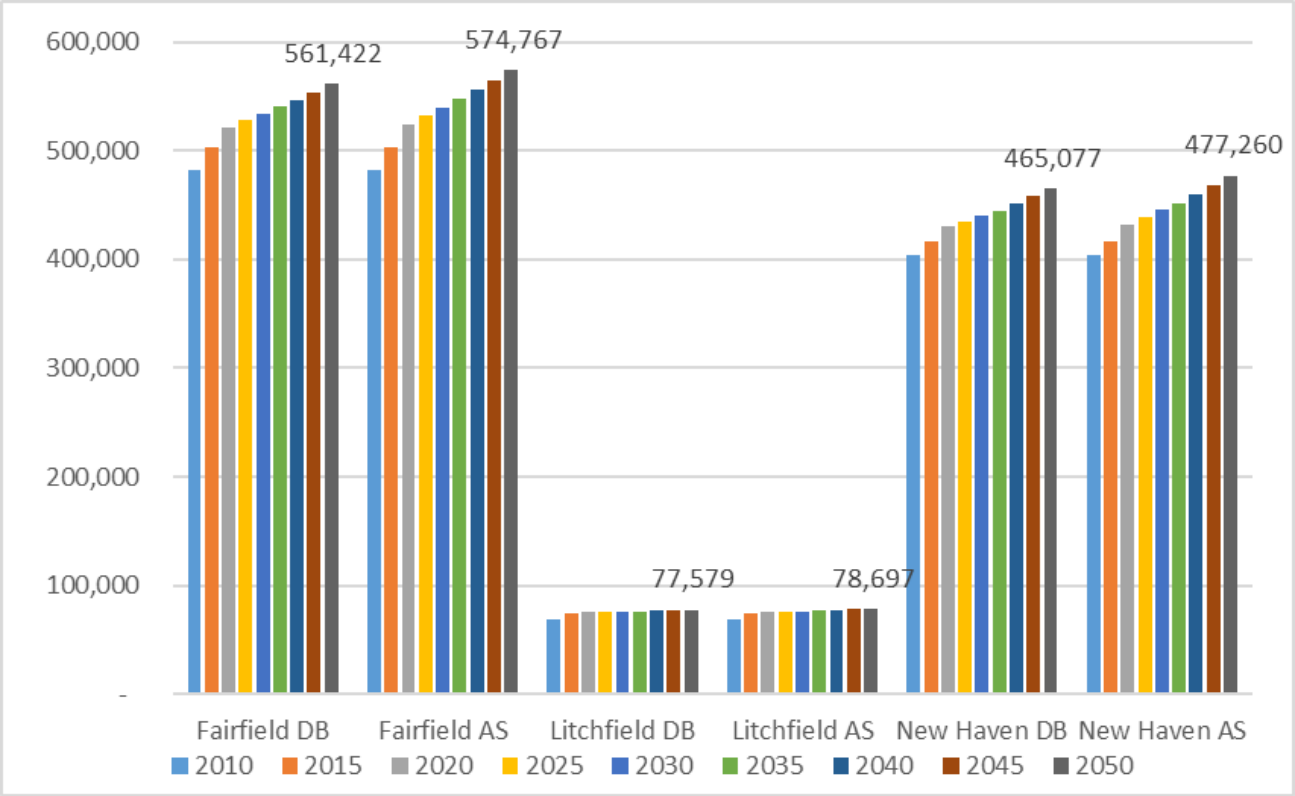
2.4.4 New Jersey

Employment in the New Jersey Sub-Region is the same for both employment model adjustments.

2.4.5 Connecticut

Connecticut will also see additional employment under the alternative scenario. As shown in Figure 17, there will be minimal excess in Litchfield County but 13,000 more in Fairfield County, and 12,000 more in New Haven County.

Figure 17. Comparative Employment Forecasts by County: Connecticut



Source: NYMTC SEDS Update Employment Models Draft Baseline and Alternative scenarios run 12/20/2019.

3.0 Population

As noted in NYMTC Technical Memoranda 1 and 2, the New York City Department of City Planning (NYCDCP) prepares separate Population Models that are then incorporated into the NYMTC forecasts. NYCDCP's most recent population forecasts were completed in December of 2019; the discussion of the updates and enhancements made by NYCDCP have been incorporated into Section 3.1 of this memorandum, which presents the New York City Population Forecast. The description of the adjustments to the NYMTC Population forecasts for the four sub-regions outside of the City commences in Section 3.3.

3.1 NYC Population Forecast

3.1.1 Forecast Updates and Enhancements—New York City Counties

This section of the technical memorandum document will describe the changes made to the County forecasts and Zonal Allocation methodology for New York Counties and TAZs. While the overall methodology has remained the same from the 2050 Forecast to the Updated Forecast, there have been updates to input variables due to the release of more recent data or enhanced methodology. The updates will be described in each section below for the County level data.

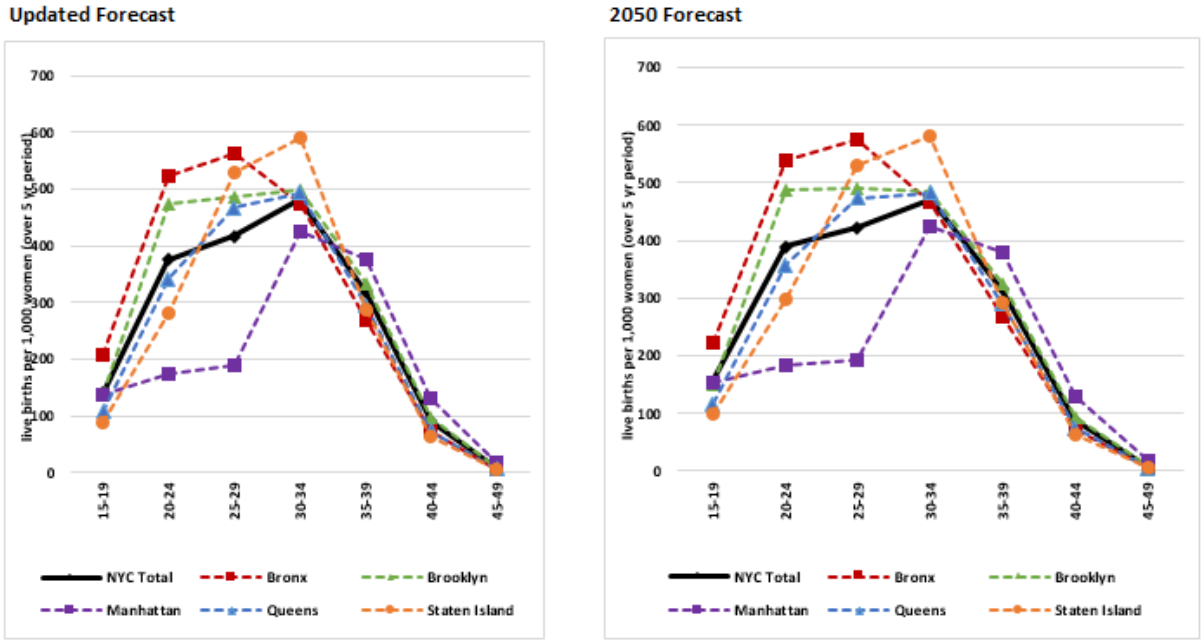
3.1.2 NYC Population Forecast—Cohort-Component Model Base Inputs

The cohort-component model discussed in the methodology documents, *NYMTC 2050 SED Forecast, Technical Memorandum on Methodological Approach* was also used in the Updated Forecast. Where new or additional data has been released, DCP updated the data inputs to the model. Data updates for the cohort-component model are described in the sections below.

3.1.2.1 Fertility Rates

Section 3.2.1.1, "Fertility Rates" of the *NYMTC 2050 SED Forecast, Technical Memorandum on Methodology* describes the fertility inputs used for the cohort-component model. While the methodology to calculate fertility rates remained the same, the data inputs to the calculations were updated. For the 2050 Forecast, birth data from the Department of Health and Mental Hygiene for the years 2008, 2009, and 2010 were averaged as inputs to the calculation of the age-specific fertility rates. For the Updated Forecast births from 2009, 2010, and 2011 were used. At the time of the 2050 Forecast, 2011 data were not available. For the Updated Forecast, births were centered on 2010, the base year of the projection period. The updated birth data did not result in any sizeable changes in the birth rates (shown in Figures 18 and 19). As was done in the 2050 Forecast, the 2010 age-specific and total fertility rates were held constant for the entire 2010-2055 period.

Figure 18. New York City Age-Specific Fertility Rates by County, 2010



Source: NYCDCP

Figure 19. New York City Age-Specific Fertility Rates by County, 2010

Updated Forecast							
Age Group	15-19	20-24	25-29	30-34	35-39	40-44	45-49
NYC Total	141	375	417	480	318	91	8
Bronx	206	524	561	474	268	72	6
Brooklyn	138	474	487	497	334	98	8
Manhattan	137	175	189	425	376	131	16
Queens	107	341	468	493	293	74	5
Staten Island	89	282	529	590	286	64	4

2050 Forecast							
Age Group	15-19	20-24	25-29	30-34	35-39	40-44	45-49
NYC Total	154	389	422	472	315	88	8
Bronx	223	540	574	468	267	72	6
Brooklyn	150	487	491	484	324	92	8
Manhattan	154	185	194	423	378	129	17
Queens	116	358	473	483	290	74	5
Staten Island	99	299	529	581	293	62	5

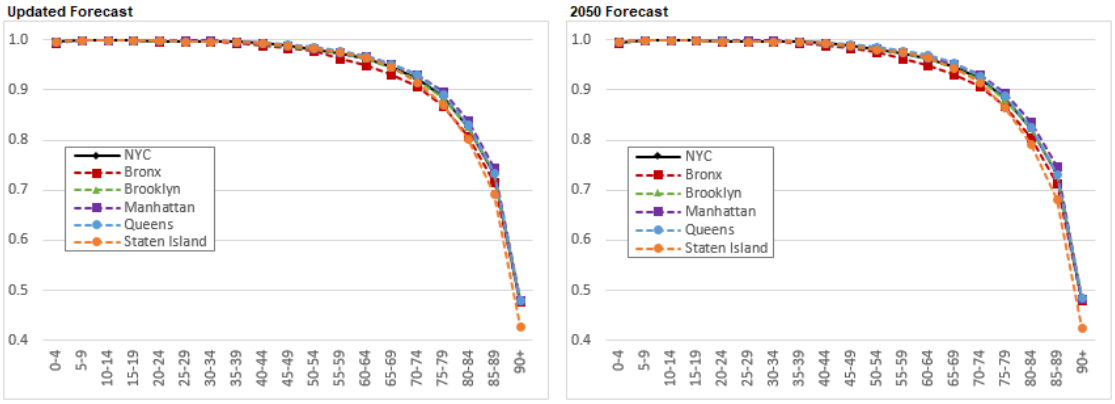
Source: NYCDCP

3.1.2.2 Survival Rates

Section 3.2.1.2 "Survival Rates" of the *NYMTC 2050 SED Forecast, Technical Memorandum on Methodology* describes the survival inputs used for the cohort-component model. For the 2050 Forecast, 2008, 2009, and 2010 death data were averaged to calculate age-specific death rates based on the 2010 population. As with births, the deaths were updated to use 2009, 2010, and 2011 data, again to center on 2010. The updated death data did not result in any sizeable changes in survival rates (shown in Figures 20 and 21). As done in the 2050 Forecast, the survival rates were

adjusted starting in 2020 based on improvements in age-specific survival anticipated by the United States Social Security Administration.

Figure 20. New York City Age-Specific Survival Rates by County, 2010



Source: NYCDCP

Figure 21. New York City Age-Specific Survival Rates by County, 2010

Updated Forecast						
Age Group	NYC	Bronx	Brooklyn	Manhattan	Queens	Staten Island
0-4	0.995	0.994	0.995	0.996	0.995	0.995
5-9	0.999	0.999	0.999	0.999	0.999	0.999
10-14	0.999	0.999	0.999	0.999	0.999	1.000
15-19	0.999	0.999	0.999	0.999	0.999	0.999
20-24	0.998	0.997	0.997	0.998	0.998	0.998
25-29	0.997	0.996	0.997	0.998	0.998	0.997
30-34	0.997	0.995	0.997	0.998	0.997	0.996
35-39	0.996	0.994	0.995	0.997	0.997	0.996
40-44	0.993	0.990	0.992	0.995	0.995	0.994
45-49	0.988	0.984	0.987	0.990	0.991	0.988
50-54	0.982	0.977	0.980	0.984	0.986	0.982
55-59	0.974	0.964	0.972	0.976	0.979	0.975
60-64	0.963	0.949	0.962	0.967	0.968	0.964
65-69	0.947	0.932	0.945	0.953	0.953	0.946
70-74	0.924	0.907	0.921	0.932	0.930	0.917
75-79	0.886	0.869	0.884	0.898	0.892	0.871
80-84	0.827	0.808	0.827	0.839	0.832	0.803
85-89	0.732	0.716	0.733	0.746	0.735	0.693
90+	0.476	0.478	0.478	0.481	0.481	0.428

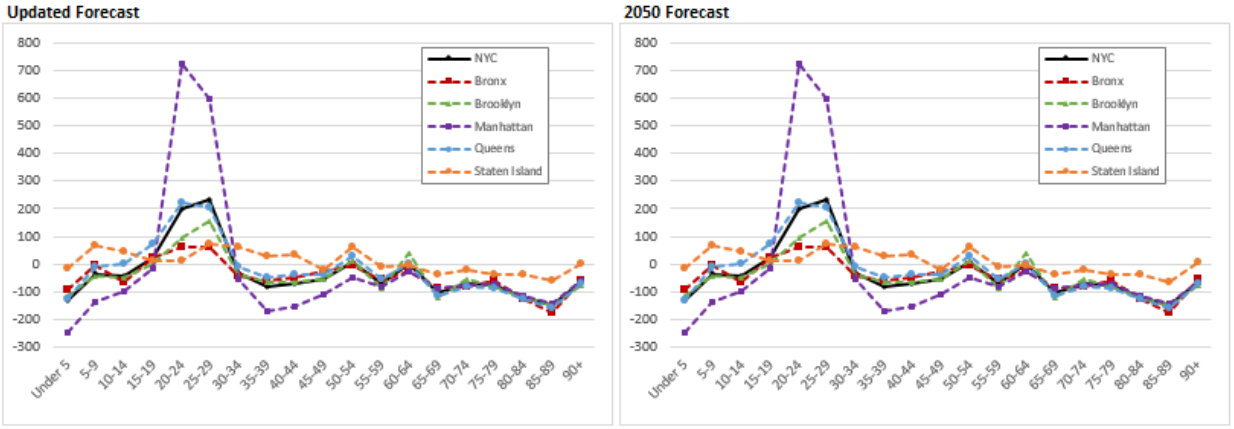
2050 Forecast						
Age Group	NYC	Bronx	Brooklyn	Manhattan	Queens	Staten Island
0-4	0.995	0.994	0.995	0.996	0.995	0.996
5-9	0.999	0.999	0.999	0.999	0.999	0.999
10-14	0.999	0.999	0.999	0.999	0.999	1.000
15-19	0.999	0.999	0.999	0.999	0.999	0.999
20-24	0.998	0.997	0.997	0.998	0.998	0.998
25-29	0.997	0.996	0.997	0.998	0.998	0.997
30-34	0.997	0.995	0.996	0.998	0.997	0.996
35-39	0.996	0.994	0.995	0.997	0.996	0.995
40-44	0.993	0.989	0.992	0.994	0.994	0.993
45-49	0.988	0.984	0.987	0.989	0.991	0.988
50-54	0.982	0.976	0.980	0.983	0.985	0.982
55-59	0.973	0.964	0.972	0.975	0.979	0.975
60-64	0.963	0.950	0.961	0.966	0.969	0.964
65-69	0.947	0.932	0.945	0.953	0.953	0.944
70-74	0.923	0.907	0.920	0.931	0.930	0.915
75-79	0.884	0.868	0.882	0.895	0.890	0.865
80-84	0.823	0.805	0.824	0.838	0.827	0.792
85-89	0.731	0.714	0.735	0.748	0.732	0.681
90+	0.481	0.480	0.486	0.483	0.484	0.427

Source: NYCDCP

3.1.2.3 Migration Rates

Section 3.2.1.3 "Migration Rates" of the *NYMTC 2050 SED Forecast, Technical Memorandum on Methodological* describes the age-specific and crude migration rates (CMRs) used for the cohort-component model. The calculations of age-specific migration rates for the Updated Forecast were the same as used in the 2050 Forecast, an average over a 20 year period using decennial census data from 1990-2000 and 2000-2010. However, because of updates in the birth and death data, the age-specific migration rates were minimally altered (shown below in Figure 22 and 23). The initial CMRs were calculated as they were for the 2050 Forecast. These rates also changed due to the updates in the birth and death data (shown in Figure 23).

Figure 22. New York City Age-Specific Migration Rates by County per 1,000 persons, 1990-2010



Source: NYCDCP

Figure 23. New York City Age-Specific Migration Rates by County per 1,000 persons, 1990-2010

Updated Forecast						
Age Group	NYC	Bronx	Brooklyn	Manhattan	Queens	Staten Island
Under 5	-132	-92	-116	-249	-129	-17
5-9	-35	-4	-41	-137	-12	68
10-14	-43	-64	-51	-98	0	43
15-19	22	22	0	-17	74	14
20-24	199	60	92	726	222	12
25-29	233	60	157	598	206	75
30-34	-31	-42	-40	-53	-8	60
35-39	-80	-59	-65	-173	-48	28
40-44	-70	-46	-68	-152	-39	34
45-49	-55	-28	-56	-109	-37	-19
50-54	5	-4	15	-48	28	64
55-59	-69	-57	-89	-82	-56	-11
60-64	1	-29	37	-24	0	-5
65-69	-103	-86	-122	-89	-114	-37
70-74	-69	-82	-54	-78	-81	-20
75-79	-76	-61	-81	-71	-87	-39
80-84	-119	-128	-123	-116	-128	-35
85-89	-149	-175	-148	-143	-157	-63
90+	-66	-58	-77	-63	-73	0

2050 Forecast						
Age Group	NYC	Bronx	Brooklyn	Manhattan	Queens	Staten Island
Under 5	-133	-92	-116	-249	-129	-17
5-9	-35	-4	-41	-137	-12	68
10-14	-43	-64	-51	-98	0	43
15-19	22	22	0	-17	74	14
20-24	199	60	92	726	222	12
25-29	233	60	157	598	206	75
30-34	-31	-42	-40	-53	-8	60
35-39	-80	-59	-65	-173	-48	28
40-44	-70	-46	-68	-152	-39	34
45-49	-55	-28	-56	-109	-37	-19
50-54	5	-4	15	-48	28	64
55-59	-69	-57	-89	-82	-56	-11
60-64	1	-29	37	-24	0	-5
65-69	-103	-86	-122	-89	-114	-37
70-74	-69	-82	-54	-78	-81	-20
75-79	-76	-61	-81	-71	-87	-39
80-84	-119	-128	-123	-116	-128	-35
85-89	-150	-176	-149	-142	-158	-64
90+	-65	-54	-76	-63	-71	5

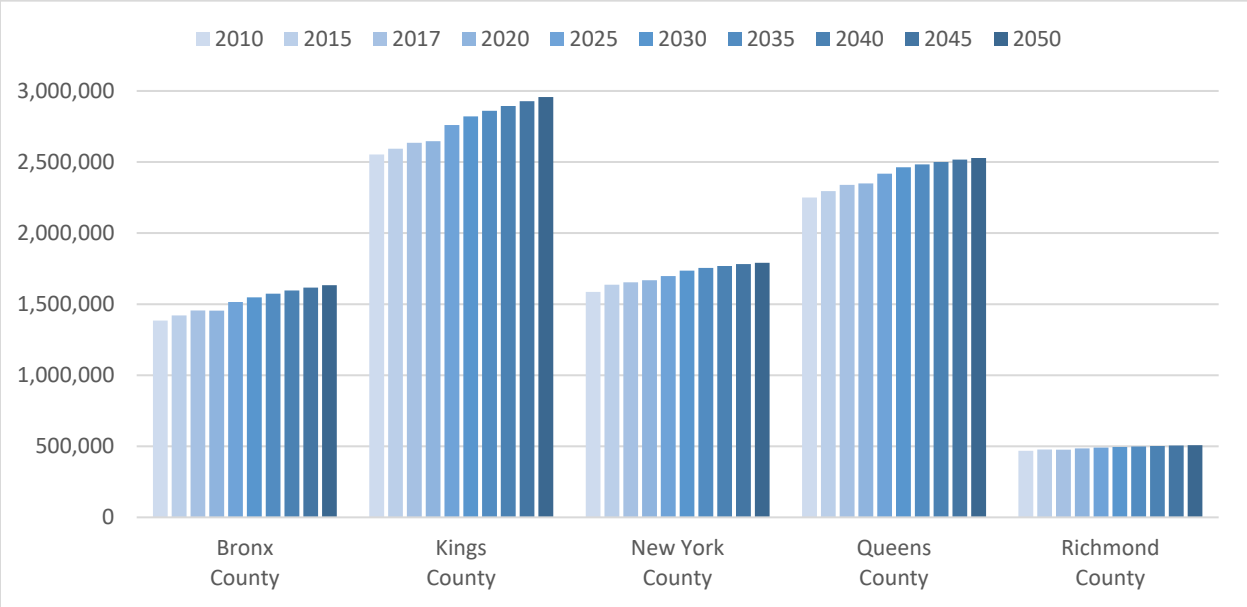
Source: NYCDCP

3.2 NYC Total Population

The cohort-component model discussed in the methodology documents, *NYMTC 2050 SED Forecast, Technical Memorandum on Methodological Approach* was also used for the Updated Forecast, where the inputs are births, deaths and net migration. For the Updated Forecast, crude migration rates were adjusted based on the updated land use scenario that DCP conducted. Figure 24 shows the population forecast results from the 2050 Forecast and the Updated Forecast. There has been a significant increase in the number of housing units in the early part of this decade, causing an increase in the population from 2010-2020, a citywide difference of about 50,000 persons in 2020 between the two forecasts. With a larger population at the start of the forecast, each period resulted in a higher population in the Updated Forecast. The housing units forecasted from the updated land use scenario resulted in a higher number than was incorporated in the 2050 Forecast, which in turn increased the population at each time point. These updates resulted in a citywide difference of about 250,000 persons in 2050 between forecasts. While there is a better understanding of changes in the population in the earlier years of the projection period, the future remains unknown. Although all counties in NYC are forecasted to grow, the population is projected to increase at a decreasing rate (see Figure 24).

The sub-regional totals in Figure 24 project a gain of roughly 814,000 residents across New York City between the 2020 and 2050 forecast years. Population growth will be led by gains in Kings County which will add 310,000 residents, followed by Bronx and Queens County where gains of 179,000 residents are expected in each county. New York County will add 123,000 residents while Richmond County's will increase modestly, with a gain of 23,000 residents.

Figure 24. NYC Population Forecast by County



Source: NYC DCP 12.20.2019

3.3 Non-NYC Sub-Regional Population

Upon reviewing the update of the Population models for the sub-regions outside of New York City, the primary concern of the project team and the FWG was the disproportionately sharp increase in population between 2015 and 2020, which was highly unlikely given recent employment growth. It was a priority at this stage of work to identify and correct the cause of this anomaly.

The population models for the non-NYC sub-regions are also cohort-component models, the key components of which are births, deaths, and net migration as detailed in *Technical Memorandum 2: Model Update to 2017 Baseline*. Linked within the Population Model is a sub-model for Civilian Labor Force, which reconciles the cohort component population model using labor force participation rates with employment inputs including the forecasts and the 31-County Closed Commutation Matrix[5] (see Appendix B). The outputs of the population and labor force models are then input into the employment model so that unemployment and multiple job-holding rates can be identified. The latter are a vital tool in determining the rationality of the population-employment balance.

[5] The Closed Commutation Matrix is a table of historically observed commuter flows associated with the 31-County Region sourced from the US Census Bureau's Census Transportation Planning Products (CTPP) program. This product is derived from the US Census Bureau's 2012-2016 American Community Survey which asks respondents about their primary workplace location and home location. When information about workers' residence location and workplace location are coupled, a commuting flow is generated.

3.3.1 Cohort-Component Model Adjustments

3.3.1.1 Migration Adjustment Scenarios

The population model provides several methods for adjusting the components, the most powerful of which are the adjustments to migration. The migration adjustments built in to the model include:

- Labor Induced Migration Adjustment (LIMA): The LIMA adjustment within the Population Model increases the net migration component of population in keeping with forecasted employment growth.
- Constrained NYC: The Constrained NYC adjustment restricts labor-induced migration in NYC, in order to maintain NYCDCP's population projections even when the Labor Induced Migration Adjustment is activated. This effectively shifts labor-induced population growth away from New York City into the surrounding sub-regions.
- Manually Input Adjustments: The final models run for the 2015 Adopted Forecasts included manual adjustments to population, much like those used for the employment forecasts and described in Section 2.1.1. The manual adjustments were used to further increase the modeled population to reflect the knowledge of the FWG members as shared during the 2015 Forecast adoption process.

In the update process, the use of the Constrained NYC adjustment was deemed unnecessary as NYC DCP prepares its own forecast (as detailed in Section 3.1 of this document) that is based to an extent on capacity for residential development. Excluding the Constrained NYC adjustment allowed for the updated population models to be run for the following three migration scenarios.

1. No Migration Adjustments
2. LIMA
3. 2015 Manual Migration Adjustments Alone

A summary of the results of these model runs follows in Section 3.3.1.2. Only the preferred version of the population model using each version of baseline employment is discussed in the body of this document.

3.3.1.2 Migration Adjustment Scenario Results

In the process of creating the population forecast, the various tools for determining the extent of labor-induced migration on the population were explored, first with simply turning them on and off, then by adjusting the levels of LIM to reach county population levels that were acceptable to the members of the FWG and made sense in terms of creating a labor force sufficient to support the forecasted population. Dozens of iterations of fine level adjustments were made before reaching the forecast alternatives described in this memo. This section is limited to describing the impacts of the key adjustments made in order to promote a better understanding of how the population model works.

The Population Model run with no migration adjustments resulted in a declining population for all sub-regions with the exception of NYC. On the regional scale, population was forecasted to decrease from 22.9 million in 2017 to 20.9 million in 2050. This resulted in a Civilian Labor Force

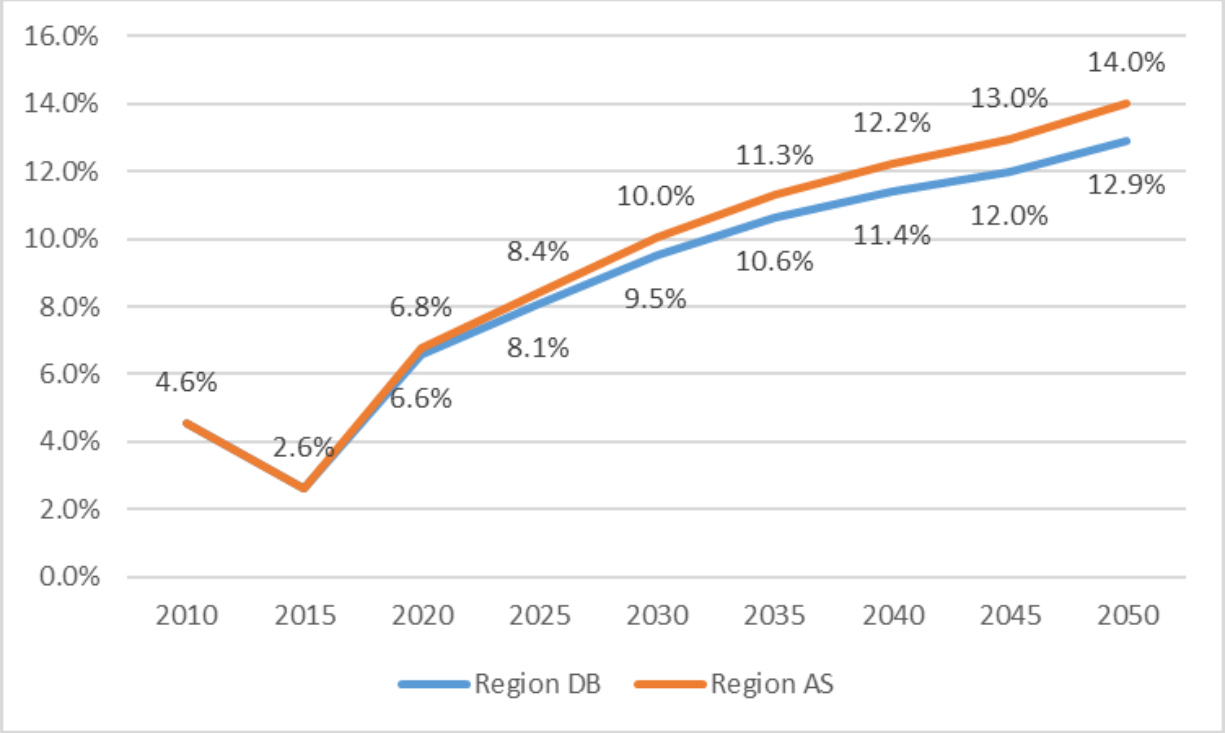
unable to meet employment demand; numbering 10.6 million in 2050, a full 3.1 million short of the forecasted 13.7 million jobs in the Draft Baseline employment forecast and 3.2 million short in the Alternative employment scenario. By 2050, this leads to a regional multiple job-holding rate of 24.3 percent and 24.5 percent, respectively. This adjustment was discarded from further analysis.

The Population Model run with Labor-Induced Migration Adjustments resulted in a rapidly increasing population for all sub-regions with the exception of NYC. On the regional scale, population was forecasted to increase from 22.9 million in 2017 to 26.4 million in 2050. This resulted in an Employed Civilian Labor Force exceeding employment demand; numbering 13.8 million in 2050, 100,000 more than the forecasted 13.7 million jobs in the Draft Baseline employment forecast. In the Alternative scenario, the Employed Civilian Labor Force is roughly 100,000 less than the total number of jobs in 2050—a similarly unlikely scenario. This permutation of the model was also discarded from further analysis.

The Population Model run with the Adopted 2015 Manual Adjustments resulted in a steadily increasing population for most sub-regions. On the regional scale, population was forecasted to increase from 22.9 million in 2017 to 23.8 million in 2050. This resulted in a Civilian Labor Force of 12.1 million in 2050, 1.6 million less than the forecasted 13.7 million jobs in the Draft Baseline employment forecast and 1.8 million less than total employment in the Alternative scenario.

This variation of the model was tested against both versions of employment forecasts as detailed in the following sections. This leads to regional multiple job-holding rates of 12.9 percent and 14.0 percent, respectively, by 2050 as shown in Figure 25.

Figure 25. Regional Multiple-Job Holding Rates: Draft Baseline and Alternative Scenarios



Source: NYMTC SED Update Population Models 12-20-2019

3.4 Population Model Results

The Population results were modeled using both the Draft and the Alternative employment forecasts as inputs. However, the employment inputs impact the population model only if the Labor Induced Migration control is turned on, therefore there is no difference in population, labor force, and employed labor force between the two employment scenarios.

What follows is a discussion of the Population forecast under the current scenario. Please keep in mind that these Population forecasts are very preliminary and will be adjusted further based upon the FWG's comments.

3.4.1 Total Population

Figure 26 compares the Draft Baseline forecast to the 2015 Adopted forecasts by sub-region. As shown, population growth between 2020 and 2050 region-wide is 1.2 million, roughly one third of 3.2 million previously forecast growth over the 30 year period; however, at least in the near term, it is better aligned with the 2017 historical population.

Figure 26. Regional Comparison of 2017 Population, Draft Baseline and 2015 Adopted Forecasts

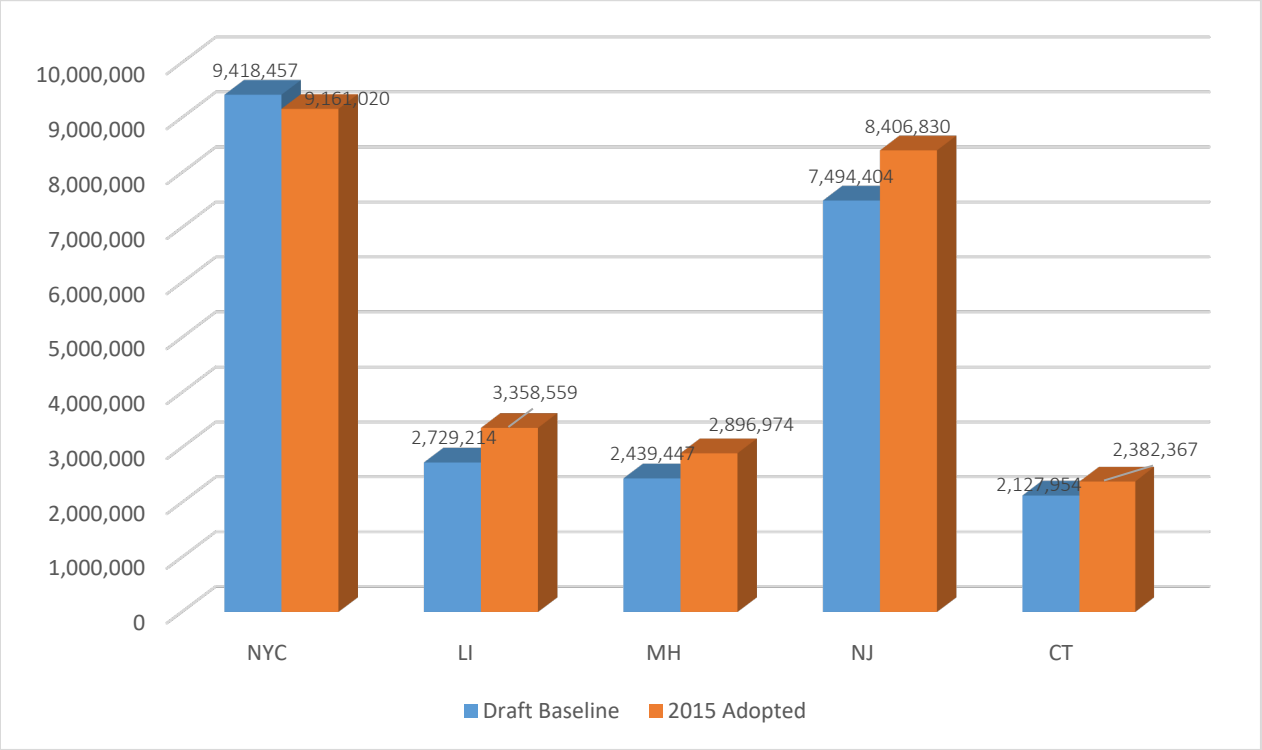
Area	Draft Baseline						Adopted 2015				
	Population			Change, 2020-2050		Area % of 2050	Population		Change, 2020-2050		Area % of 2050
	2017	2020	2050	Number	%		2020	2050	Number	%	
31-County Region	22,866,626	22,992,705	24,209,477	+1,216,771	+5.3%	100.0%	23,021,904	26,205,750	+3,183,846	+13.8%	100.0%
NYC	8,560,072	8,604,697	9,418,457	+813,760	+9.5%	38.9%	8,550,972	9,161,020	+610,048	+7.1%	35.0%
LI	2,860,664	2,866,385	2,729,214	-137,171	-4.8%	11.3%	2,868,534	3,358,559	+490,025	+17.1%	12.8%
MH	2,329,583	2,343,560	2,439,447	+95,887	+4.1%	10.1%	2,374,821	2,896,974	+522,153	+22.0%	11.1%
NJ	7,122,398	7,164,205	7,494,404	+330,199	+4.6%	31.0%	7,189,718	8,406,830	+1,217,112	+16.9%	32.1%
CT	1,993,909	2,013,858	2,127,954	+114,096	+5.7%	8.8%	2,037,859	2,382,367	+344,508	+16.9%	9.1%

Source: NYMTC SED 2015 Adopted Forecasts, Draft Update Population Models 01-17-2020

In the 2017 Draft Baseline Population forecast, New York City will see the most growth in both number and share; it is also the only sub-region to see more growth than previously forecast. In the Adopted forecasts, Long Island, New Jersey, and the Connecticut saw almost identical rates of change at 17 percent. In the updated Draft Baseline, Long Island sees a decline in total population through the forecast years, whereas growth in the New Jersey and Connecticut are reduced to 4.6 percent and 5.7 percent, respectively. The Mid-Hudson sub-region was projected to grow by more than 500,000 residents according to the adopted forecasts, however the 2017 Baseline Draft indicates a much slower rate of growth.

Figure 27 illustrates the difference in the Draft Baseline and Adopted population forecasts in the terminal year of 2050.

Figure 27. Sub-Regional Comparison of Draft Baseline and Adopted Population 2050



Source: NYMTC SED 2015 Adopted Forecasts, Draft Update Population Models 01-17-2020

The full comparison on a county by county basis is found in Figure 28 on the following page, as well as in spreadsheet form in Appendix C.

Figure 28. Population Forecasts by County

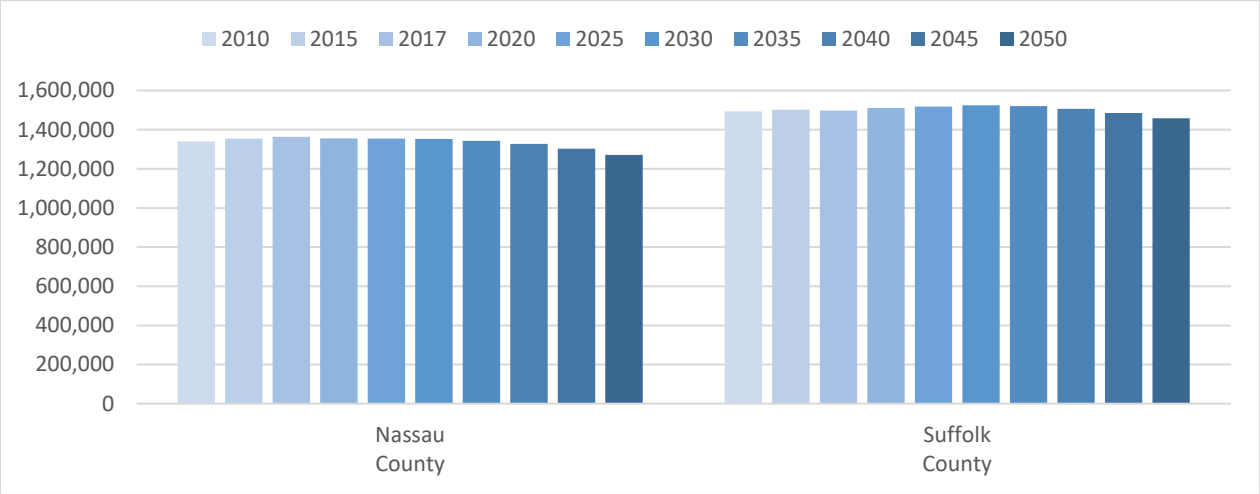
	Historical			Draft Baseline						
	2010	2015	2017	2020	2025	2030	2035	2040	2045	2050
FORECAST REGION	**22,282,010**	**22,643,291**	**22,866,626**	**22,992,705**	**23,401,696**	**23,725,306**	**23,938,254**	**24,072,585**	**24,166,997**	**24,209,477**
Bronx County	1,385,108	1,420,476	1,455,846	1,454,816	1,515,667	1,548,245	1,573,786	1,595,881	1,616,845	1,633,550
Kings County	2,552,911	2,593,655	2,635,121	2,647,112	2,760,391	2,820,822	2,860,506	2,894,388	2,928,160	2,956,932
New York County	1,585,873	1,636,538	1,653,877	1,668,548	1,698,050	1,735,482	1,754,534	1,768,412	1,781,885	1,791,292
Queens County	2,250,002	2,294,943	2,339,280	2,349,324	2,418,636	2,463,405	2,483,716	2,500,457	2,517,076	2,528,763
Richmond County	468,730	477,525	475,948	484,897	491,202	495,047	498,769	502,327	505,464	507,920
NYC Total	**8,242,624**	**8,423,137**	**8,560,072**	**8,604,697**	**8,883,946**	**9,063,001**	**9,171,311**	**9,261,465**	**9,349,430**	**9,418,457**
Nassau County	1,339,532	1,354,612	1,363,069	1,355,440	1,354,724	1,352,382	1,342,945	1,327,204	1,302,949	1,271,024
Suffolk County	1,493,350	1,501,373	1,497,595	1,510,945	1,517,694	1,524,787	1,520,635	1,506,674	1,485,365	1,458,191
LI Total	**2,832,882**	**2,855,985**	**2,860,664**	**2,866,385**	**2,872,418**	**2,877,169**	**2,863,580**	**2,833,877**	**2,788,314**	**2,729,214**
Dutchess County	297,488	296,928	295,685	299,608	301,802	304,276	305,732	305,103	302,949	299,835
Orange County	372,813	375,384	378,174	386,733	399,050	413,269	426,790	439,052	449,301	459,246
Putnam County	99,710	99,488	99,464	100,079	100,067	100,374	100,538	100,180	99,124	97,336
Rockland County	311,687	320,688	325,027	325,437	331,249	337,901	343,089	348,375	352,793	358,156
Sullivan County	77,547	76,330	75,783	76,308	75,439	74,132	72,067	69,602	67,058	64,449
Ulster County	182,493	181,300	180,129	183,175	184,283	184,903	184,175	181,653	178,186	174,518
Westchester County	949,113	967,315	975,321	972,220	975,752	981,912	988,960	990,847	989,903	985,907
MH Total	**2,290,851**	**2,317,433**	**2,329,583**	**2,343,560**	**2,367,642**	**2,396,767**	**2,421,352**	**2,434,810**	**2,439,314**	**2,439,447**
Bergen County	905,116	926,330	937,920	934,680	936,440	936,863	933,922	923,172	914,138	904,609
Essex County	783,969	791,609	800,401	802,418	812,822	822,397	827,323	833,302	837,971	845,518
Hudson County	634,266	662,619	679,756	679,017	689,624	702,799	709,624	715,924	723,900	730,528
Hunterdon County	127,351	126,250	125,717	126,287	125,249	124,881	124,342	123,410	121,989	119,396
Mercer County	367,511	370,212	373,362	379,030	387,389	396,346	404,926	411,868	418,388	424,919
Middlesex County	809,858	830,300	837,288	843,487	851,561	860,819	867,757	874,871	877,026	881,509
Monmouth County	630,380	629,185	627,551	631,364	628,154	625,930	622,747	616,302	611,369	600,739
Morris County	492,276	498,192	498,847	507,744	507,217	506,999	501,955	495,837	490,336	482,891
Ocean County	576,567	583,450	589,699	597,849	619,182	642,177	679,772	698,782	718,987	739,760
Passaic County	501,226	507,574	510,563	516,596	523,919	533,965	538,817	551,411	562,172	571,239
Somerset County	323,444	330,604	333,316	334,227	334,771	334,151	333,688	334,088	334,517	336,077
Sussex County	149,265	145,930	143,570	146,245	144,931	144,205	144,019	143,952	142,919	140,619
Union County	536,499	548,744	557,320	557,608	566,683	576,553	584,823	593,712	601,642	609,148
Warren County	108,692	107,226	107,088	107,654	108,141	108,892	108,920	109,347	108,749	107,452
NJ Total	**6,946,420**	**7,058,225**	**7,122,398**	**7,164,205**	**7,236,081**	**7,316,975**	**7,382,634**	**7,425,977**	**7,464,102**	**7,494,404**
Fairfield County	916,829	939,983	947,328	947,612	954,952	965,259	977,199	986,700	993,157	996,148
Litchfield County	189,927	186,304	184,454	186,500	187,115	187,783	188,434	187,023	185,186	182,089
New Haven County	862,477	862,224	862,127	879,746	899,542	918,352	933,744	942,732	947,493	949,717
CT Total	**1,969,233**	**1,988,511**	**1,993,909**	**2,013,858**	**2,041,609**	**2,071,394**	**2,099,377**	**2,116,455**	**2,125,836**	**2,127,954**

Source: NYMTC SED Update Population Models 01-17-2020

3.4.1.1 Long Island Counties

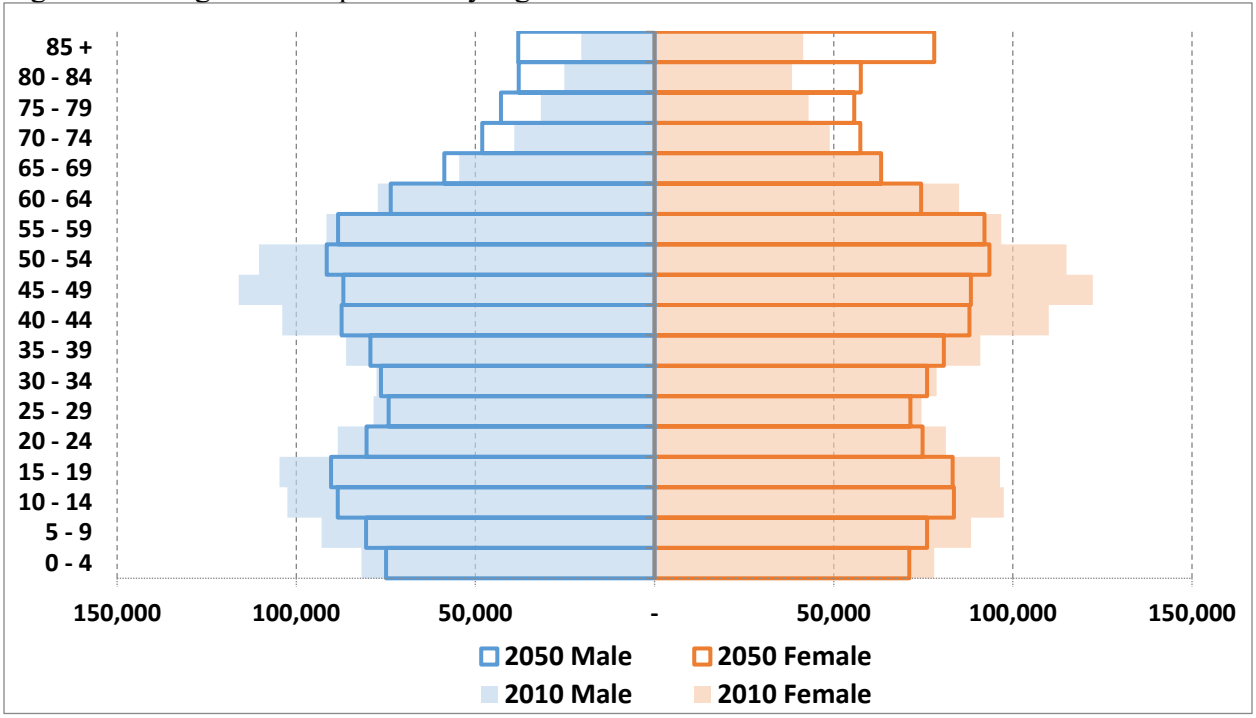
The sub-regional totals in Figure 28 showed a loss of more than 137,000 residents between the 2020 and 2050 forecast years. Figure 29 illustrates Long Island's population forecast by county, which shows that the decline in population is split between the two constituent counties. In this scenario, Nassau's population peaks in 2020, after which it begins a slow decline. Suffolk County's population continues to increase only through 2030 before beginning to decrease. This is not unexpected given the aging of the population on Long Island (see Figure 30), high costs of housing, and relatively slow rate of development.

Figure 29. Population by County: Long Island



Source: NYMTC SED Update Population Models 01-17-2020

Figure 30. Long Island Population by Age

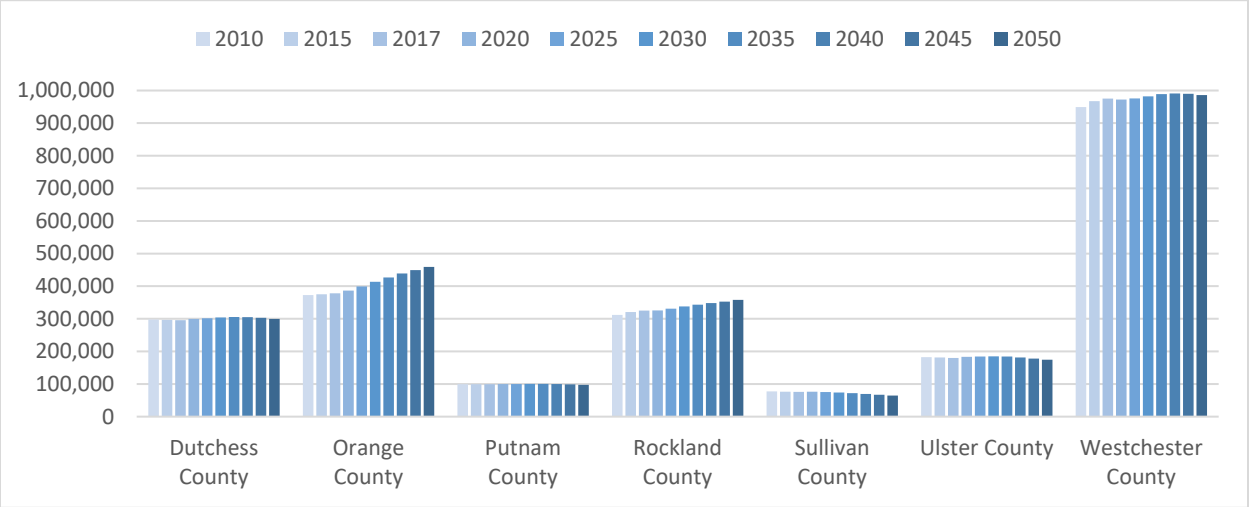


Source: NYMTC SED Update Population Models 01-17-2020

3.4.1.2 Mid-Hudson Counties

As shown in Figure 28 at the sub-region level, in the draft scenarios, the Mid-Hudson will grow by nearly 96,000 residents between the 2020 and 2050 forecast years. As shown in Figure 31, all of the population growth will occur in Orange and Rockland counties while the remaining counties will hold relatively steady.

Figure 31. Population by County: Mid-Hudson

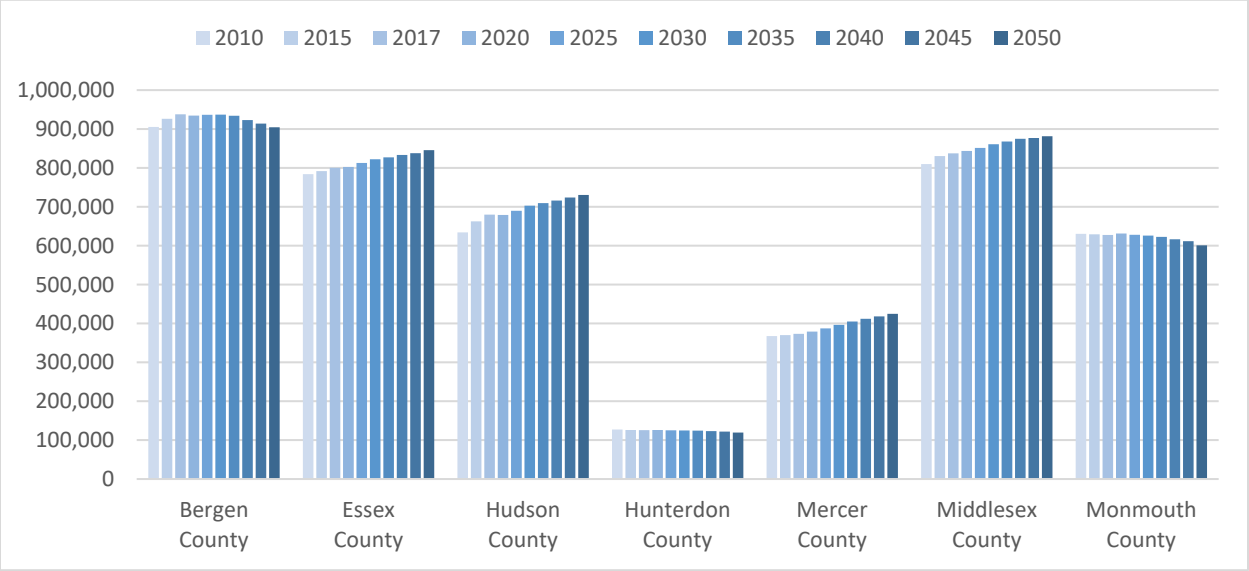


Source: NYMTC SED Update Population Models 01-17-2020

3.4.1.3 New Jersey Counties

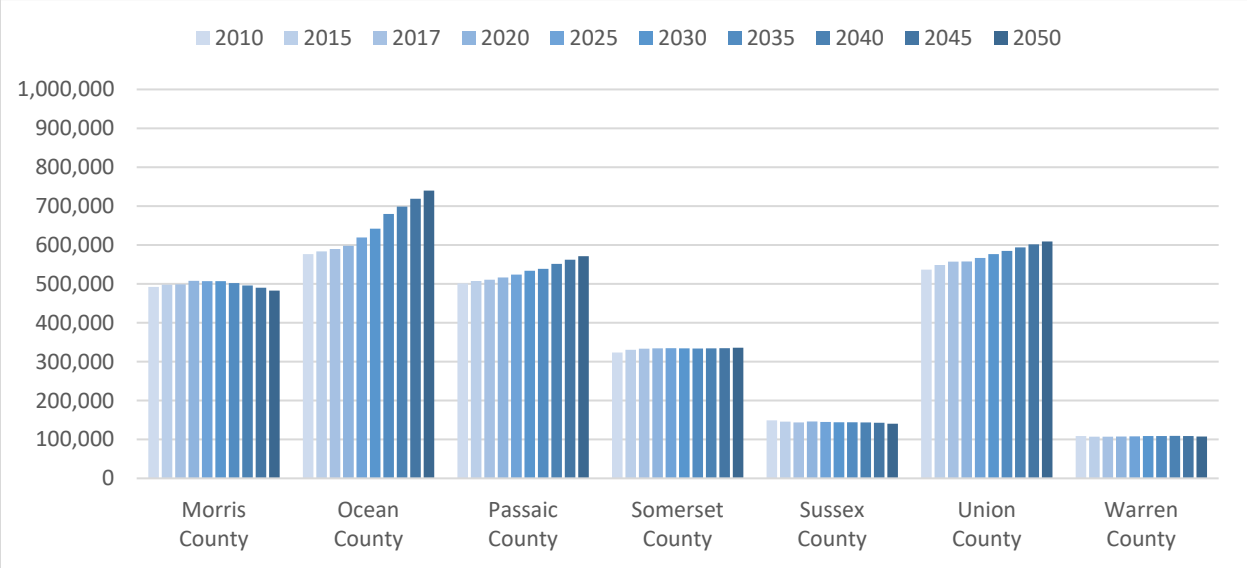
The New Jersey sub-region will see steady growth of some 11,000 persons per year in the current forecasting scenario. Based on the cohort-component models with the Adopted 2015 adjustments to migration and illustrated in Figures 32 and 33, growth is expected in Hudson, Essex, Mercer, Middlesex, Ocean, Passaic, and Union counties. Bergen, Hunterdon, Monmouth, Morris, and Sussex exhibit declines, while the remaining counties hold relatively steady.

Figure 32. Population by County: New Jersey (Pt. 1)



Source: NYMTC SED Update Population Models 01-17-2020

Figure 33. Population by County: New Jersey (Pt. 2)

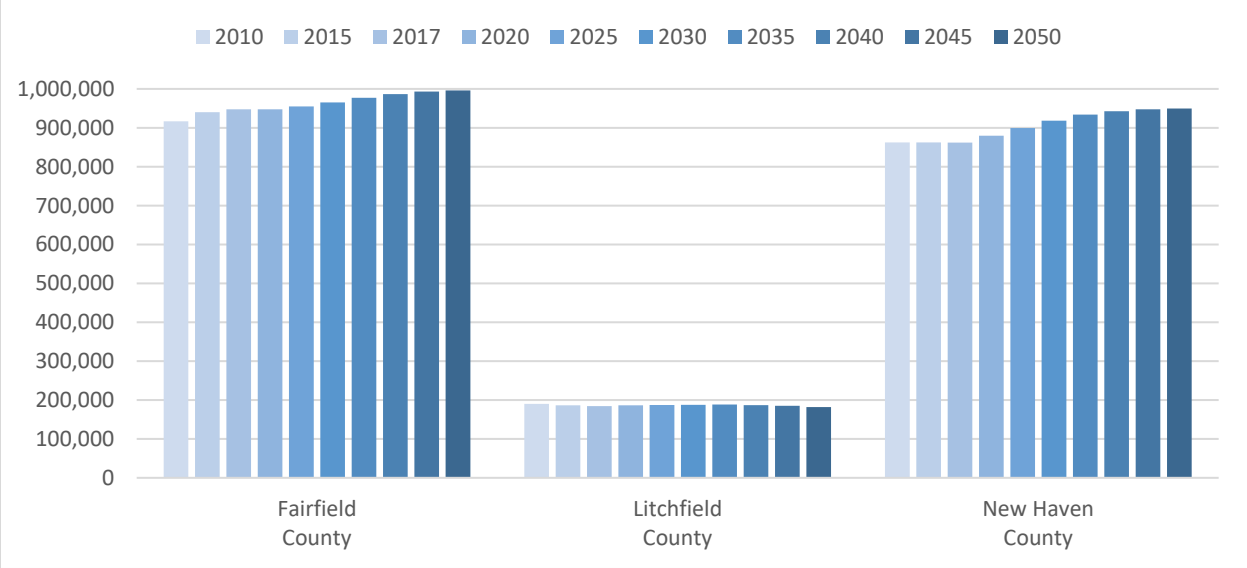


Source: NYMTC SED Update Population Models 01-17-2020

3.4.1.4 Connecticut Counties

Connecticut will also see population growth in the currently modeled scenario with Fairfield and New Haven counties increasing by 49,000 and 70,000 respectively, while Litchfield loses 4,000 residents in the 2020 to 2050 forecast years as shown in Figure 34.

Figure 34. Population by County: Connecticut



Source: NYMTC SED Update Population Models 01-17-2020

4.0 Labor Force

As with population, labor force is a place-of-residence driven factor, therefore the model presents no employment-driven labor force change without the Labor Induced Migration adjustment.

4.1 Civilian Labor Force

Figure 35 presents a comparison of the Draft Baseline and Adopted forecasts of civilian labor force by sub-region. Using the current model adjustments, the civilian labor force will not increase at the same rate as the population at large between 2020 and 2050, and will actually decrease in Long Island and the Mid-Hudson, reflecting the aging of the population in suburban counties and declining labor force participation by age.

Figure 35. Regional Comparison of 2017 Labor Force, Draft Baseline and 2015 Adopted Forecasts

Area	Draft Baseline						Adopted 2015				
	Labor Force			Change, 2020-2050		Area % of 2050	Labor Force		Change, 2020-2050		Area % of 2050
	2017	2020	2050	Number	%		2020	2050	Number	%	
31-County Region	11,914,009	11,957,421	12,236,214	+278,793	+2.3%	100.0%	11,945,120	13,413,002	+1,467,882	+12.3%	100.0%
NYC	4,377,308	4,401,767	4,745,942	+344,175	+7.8%	38.8%	4,373,960	4,604,423	+230,463	+5.3%	34.3%
LI	1,501,307	1,499,679	1,379,863	-119,816	-8.0%	11.3%	1,475,799	1,722,792	+246,993	+16.7%	12.8%
MH	1,193,961	1,195,308	1,194,397	-911	-0.1%	9.8%	1,211,906	1,469,481	+257,575	+21.3%	11.0%
NJ	3,756,355	3,770,125	3,801,937	+31,812	+0.8%	31.1%	3,777,155	4,344,313	+567,158	+15.0%	32.4%
CT	1,085,079	1,090,541	1,114,075	+23,533	+2.2%	9.1%	1,106,300	1,271,993	+165,693	+15.0%	9.5%

Source: NYMTC SED Update Population Models 01-17-2020

Figure 36 on the following page provides a county by county forecast of the civilian labor force. These same numbers can be found in tandem with employment, population, and employed labor force in spreadsheet form in Appendix C.

Figure 36. Draft Baseline Civilian Labor Force Forecasts by County

	Historical			Draft Baseline						
	2010	2015	2017	2020	2025	2030	2035	2040	2045	2050
FORECAST REGION	**11,568,295**	**11,848,339**	**11,914,009**	**11,957,421**	**12,056,787**	**12,030,607**	**12,029,676**	**12,091,859**	**12,183,064**	**12,236,214**
Bronx County	617,531	652,796	661,089	666,250	688,675	696,545	706,955	720,422	731,879	738,884
Kings County	1,236,176	1,290,832	1,298,460	1,303,545	1,349,995	1,371,783	1,395,023	1,415,920	1,427,369	1,430,346
New York County	921,966	962,233	970,336	975,738	986,066	999,959	1,012,797	1,027,912	1,040,239	1,042,066
Queens County	1,185,673	1,208,893	1,221,543	1,229,976	1,257,952	1,270,673	1,278,558	1,288,576	1,296,702	1,300,373
Richmond County	217,944	225,315	225,881	226,258	226,938	225,770	226,534	229,062	232,174	234,273
NYC Total	**4,179,290**	**4,340,068**	**4,377,308**	**4,401,767**	**4,509,626**	**4,564,731**	**4,619,865**	**4,681,893**	**4,728,364**	**4,745,942**
Nassau County	688,439	713,345	710,891	709,254	701,958	685,502	672,368	665,766	660,081	650,354
Suffolk County	784,674	790,402	790,416	790,425	782,138	763,049	746,017	738,921	735,668	729,509
LI Total	**1,473,113**	**1,503,747**	**1,501,307**	**1,499,679**	**1,484,096**	**1,448,551**	**1,418,385**	**1,404,686**	**1,395,748**	**1,379,863**
Dutchess County	155,789	156,057	155,799	155,627	153,409	149,041	146,097	145,666	146,527	146,999
Orange County	182,275	184,885	185,808	186,423	189,100	190,569	192,953	198,035	204,824	211,052
Putnam County	54,348	54,118	54,140	54,155	53,190	51,569	50,131	49,890	49,748	49,554
Rockland County	150,999	159,108	158,736	158,489	158,609	159,343	160,459	163,416	166,623	169,500
Sullivan County	39,099	37,878	37,619	37,446	36,390	35,084	33,904	32,771	31,762	30,524
Ulster County	94,826	92,284	92,262	92,247	91,377	89,211	87,573	86,416	85,646	84,361
Westchester County	497,887	507,610	509,597	510,922	510,297	505,023	500,540	498,626	499,989	502,406
MH Total	**1,175,224**	**1,191,941**	**1,193,961**	**1,195,308**	**1,192,371**	**1,179,840**	**1,171,656**	**1,174,820**	**1,185,118**	**1,194,397**
Bergen County	480,575	495,508	498,074	499,785	497,918	490,206	481,258	472,328	468,799	467,424
Essex County	400,430	410,912	413,070	414,508	418,761	419,566	419,812	420,483	422,855	426,715
Hudson County	360,289	374,134	377,084	379,051	381,192	383,914	387,357	391,486	396,655	396,895
Hunterdon County	69,840	69,667	69,790	69,871	68,041	65,436	63,166	62,533	62,430	62,557
Mercer County	195,951	194,248	196,019	197,200	200,069	201,353	203,879	206,823	211,541	216,186
Middlesex County	433,695	433,140	434,292	435,060	434,598	433,508	433,451	435,191	435,930	438,695
Monmouth County	333,624	338,741	338,762	338,776	333,007	322,841	315,064	310,357	310,514	308,357
Morris County	268,515	275,290	278,820	281,174	279,199	272,152	262,944	257,195	256,856	255,732
Ocean County	271,103	271,774	272,989	273,799	278,618	282,590	296,299	304,687	315,379	326,141
Passaic County	250,474	253,304	255,842	257,534	259,819	261,458	261,709	267,465	273,181	279,314
Somerset County	180,098	181,944	183,601	184,706	184,454	180,437	176,697	175,707	176,422	179,291
Sussex County	82,916	81,739	81,032	80,561	77,570	74,091	71,815	71,530	71,729	71,575
Union County	290,559	295,461	297,149	298,275	300,656	302,198	304,113	307,703	311,932	316,786
Warren County	58,848	59,836	59,830	59,825	59,243	57,683	56,062	55,889	56,139	56,269
NJ Total	**3,676,918**	**3,735,699**	**3,756,355**	**3,770,125**	**3,773,145**	**3,747,434**	**3,733,625**	**3,739,375**	**3,770,362**	**3,801,937**
Fairfield County	485,934	508,682	512,310	514,729	516,689	513,045	511,278	514,531	520,466	526,635
Litchfield County	106,195	106,460	105,589	105,008	102,456	98,736	96,173	95,027	95,849	96,112
New Haven County	471,620	461,743	467,180	470,804	478,405	478,271	478,694	481,527	487,157	491,328
CT Total	**1,063,750**	**1,076,885**	**1,085,079**	**1,090,541**	**1,097,549**	**1,090,052**	**1,086,145**	**1,091,085**	**1,103,472**	**1,114,075**

Source: NYMTC SED Update Population Models 01-17-2020

4.2 Employed Labor Force

As shown in Figure 37, the employed labor force will continue to grow on a Regional basis in the 2020-2050 forecast term. Again reflecting the aging of the population, Long Island will experience decline in employed labor force. In contrast, New Jersey will see greater growth in employed labor force than in total labor force according to the Draft Baseline forecasts, indicative of a decreasing unemployment rate.

There will be further adjustments to the labor force participation rates as the process continues.

Figure 37. Regional Comparison of 2017 Employed Labor Force, Draft Baseline and 2015 Adopted Forecasts

Area	Draft Baseline						Adopted 2015				
	Employed Labor Force			Change, 2020-2050		Area % of 2050	Employed Labor Force		Change, 2020-2050		Area % of 2050
	2017	2020	2050	Number	%		2020	2050	Number	%	
31-County Region	11,264,267	11,393,859	11,767,102	+373,244	+3.3%	100.0%	11,131,027	12,627,509	+1,496,482	+13.4%	100.0%
NYC	4,098,276	4,151,683	4,516,183	+364,500	+8.8%	38.4%	4,026,789	4,275,699	+248,910	+6.2%	33.9%
LI	1,444,397	1,453,873	1,347,774	-106,099	-7.3%	11.5%	1,401,792	1,650,182	+248,390	+17.7%	13.1%
MH	1,134,158	1,144,517	1,154,288	+9,770	+0.9%	9.8%	1,137,034	1,392,428	+255,394	+22.5%	11.0%
NJ	3,570,559	3,615,484	3,686,174	+70,689	+2.0%	31.3%	3,534,201	4,109,759	+575,558	+16.3%	32.5%
CT	1,016,879	1,028,301	1,062,685	+34,384	+3.3%	9.0%	1,031,210	1,199,440	+168,230	+16.3%	9.5%

Source: NYMTC SED Update Population Models 01-17-2020

The complete employed labor force forecasts by county from the Draft Baseline follow in Figure 38.

Figure 38. Draft Baseline Employed Labor Force Forecasts

	Historical			Draft Baseline						
	2010	2015	2017	2020	2025	2030	2035	2040	2045	2050
FORECAST REGION	**10,370,686**	**11,069,387**	**11,264,267**	**11,393,859**	**11,405,349**	**11,418,769**	**11,454,837**	**11,551,665**	**11,677,264**	**11,767,102**
Bronx County	520,228	582,732	594,008	601,197	614,636	625,034	637,687	653,212	667,029	676,877
Kings County	1,101,924	1,192,139	1,214,832	1,229,960	1,264,817	1,289,704	1,315,955	1,340,136	1,355,476	1,362,816
New York County	837,475	903,201	918,487	928,679	934,040	949,424	963,792	980,388	994,383	998,372
Queens County	1,054,073	1,126,363	1,155,021	1,174,126	1,193,983	1,209,452	1,220,263	1,233,156	1,244,285	1,251,170
Richmond County	198,188	213,237	215,928	217,721	217,321	216,717	217,950	220,889	224,402	226,948
NYC Total	**3,711,889**	**4,017,671**	**4,098,276**	**4,151,683**	**4,224,796**	**4,290,330**	**4,355,647**	**4,427,780**	**4,485,576**	**4,516,183**
Nassau County	631,146	679,006	685,558	689,927	679,043	664,938	653,921	649,205	645,353	637,510
Suffolk County	719,152	751,176	758,838	763,946	751,931	735,498	720,894	715,834	714,471	710,264
LI Total	**1,350,298**	**1,430,182**	**1,444,397**	**1,453,873**	**1,430,974**	**1,400,436**	**1,374,816**	**1,365,039**	**1,359,824**	**1,347,774**
Dutchess County	140,167	144,266	147,889	150,305	147,185	143,460	141,069	141,094	142,371	143,275
Orange County	167,127	175,776	177,841	179,218	180,932	182,763	185,465	190,778	197,760	204,229
Putnam County	49,413	51,255	51,605	51,838	50,537	49,177	47,974	47,913	47,944	47,924
Rockland County	139,826	148,682	150,997	152,540	151,482	152,762	154,396	157,816	161,498	164,883
Sullivan County	33,369	34,586	34,353	34,197	32,701	31,779	30,946	30,138	29,431	28,496
Ulster County	85,282	87,130	87,844	88,320	86,648	84,996	83,817	83,087	82,720	81,847
Westchester County	455,021	476,924	483,629	488,100	484,821	481,112	478,090	477,507	480,060	483,634
MH Total	**1,070,207**	**1,118,618**	**1,134,158**	**1,144,517**	**1,134,305**	**1,126,049**	**1,121,757**	**1,128,331**	**1,141,784**	**1,154,288**
Bergen County	439,847	473,046	479,339	483,535	478,987	472,893	465,518	458,115	455,918	455,802
Essex County	344,101	368,905	380,075	387,522	387,187	390,051	392,332	395,015	399,311	405,042
Hudson County	313,256	346,716	357,600	364,857	364,317	368,204	372,761	378,002	384,277	385,795
Hunterdon County	62,863	66,751	67,515	68,025	65,647	63,415	61,478	61,122	61,281	61,667
Mercer County	174,984	179,849	184,664	187,874	189,126	191,071	194,185	197,716	202,971	208,188
Middlesex County	390,279	409,399	414,391	417,719	414,439	414,788	416,078	419,097	421,159	425,191
Monmouth County	304,710	319,425	322,583	324,688	316,784	308,243	301,885	298,426	299,629	298,591
Morris County	245,210	261,595	268,314	272,794	269,181	263,199	255,052	250,219	250,629	250,272
Ocean County	241,314	256,961	260,288	262,505	264,540	269,599	283,983	293,365	305,051	316,897
Passaic County	222,718	241,431	245,732	248,599	247,908	250,903	252,529	259,498	266,491	273,952
Somerset County	167,223	172,336	176,146	178,686	177,499	174,086	170,907	170,377	171,499	174,723
Sussex County	73,759	77,267	77,171	77,107	73,593	70,597	68,715	68,728	69,205	69,341
Union County	254,625	273,603	280,061	284,367	283,607	286,556	289,827	294,721	300,265	306,454
Warren County	53,593	55,888	56,679	57,206	56,307	54,988	53,597	53,584	53,978	54,257
NJ Total	**3,288,483**	**3,503,171**	**3,570,559**	**3,615,484**	**3,589,121**	**3,578,593**	**3,578,846**	**3,597,984**	**3,641,664**	**3,686,174**
Fairfield County	433,778	469,551	478,656	484,726	483,315	481,493	481,365	485,968	493,132	500,553
Litchfield County	95,796	100,362	100,165	100,034	96,733	93,633	91,590	90,881	92,053	92,693
New Haven County	420,236	429,832	438,058	443,541	446,105	448,236	450,816	455,681	463,231	469,439
CT Total	**949,810**	**999,745**	**1,016,879**	**1,028,301**	**1,026,153**	**1,023,361**	**1,023,771**	**1,032,530**	**1,048,417**	**1,062,685**

Source: NYMTC SED Update Population Models 01-17-2020

5.0 Next Steps

The project team will collect your responses and comments to the Draft Baseline and Alternative scenarios. In particular, we are looking for your reactions to the employment and population numbers for your respective counties. These comments will provide the next steps in reconciling the Population and Employment forecasts.

In order to make your analysis easier, the team is providing the model outputs and other contextual information as noted in the text as Excel spreadsheet appendices.