



YORKTOWN COMMUNITY SCHOOLS

**Yorktown Community Schools, IN
Demographic Study**

October, 2017

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Executive Summary

1. The resident total fertility rate for Yorktown Community Schools over the life of the forecasts is below replacement level. (1.81 vs. the replacement level of 2.1)
2. Most in-migration to the district continues to occur in the 0-to-9 and 25-to-39 year old age groups.
3. The local 18-to-24 year old population continues to leave the district, going to college or moving to other urbanized areas. This population group accounts for the largest segment of the district's out migration flow.
4. The primary factors causing the district's enrollment to decrease over the next five years are the increase in the number of empty nest households, and a modest rate of in-migration of young families.
5. Changes in year-to-year enrollment over the next five years will primarily be due to smaller grade cohorts entering and moving through the school system in conjunction with larger grade cohorts leaving the system.
6. The median age of the district's population will increase from 40.7 in 2010 to 43.0 in 2025.
7. Even if the district continues to have some of annual new home construction, the rate, magnitude, and price of existing home sales will become the increasingly dominant factor affecting the amount of population and enrollment change.
8. Total district enrollment is forecasted to decrease by 101 students, or -3.9%, between 2017-18 and 2022-23. Total enrollment will increase by 26 students, or 1.0%, from 2022-23 to 2027-28.

INTRODUCTION

By demographic principle, distinctions are made between projections and forecasts. A projection extrapolates the past (and present) into the future with little or no attempt to take into account any factors that may impact the extrapolation (e.g., changes in fertility rates, housing patterns or migration patterns) while a forecast results when a projection is modified by reasoning to take into account the aforementioned factors.

To maximize the use of this study as a planning tool, the ultimate goal is not simply to project the past into the future, but rather to assess various factors' impact on the future. A variety of factors influence the future population and enrollment changes of each school district. Not all factors will influence the entire school district at the same level. Some may affect different areas at dissimilar magnitudes and rates causing changes at varying points of time within the same district. The forecaster's judgment, based on a thorough and intimate study of the district, has been used to modify the demographic trends and factors to more accurately predict likely changes. Therefore, strictly speaking, this study is a forecast, not a projection; and the amount of modification of the demographic trends varies between different areas of the district as well as within the timeframe of the forecast.

To calculate population forecasts of any type, particularly for smaller populations such as a school district, realistic suppositions must be made as to what the future will bring in terms of age specific fertility rates and residents' demographic behavior at certain points of the life course. The demographic history of the school district and its interplay with the social and economic history of the area is the starting point and basis of most of these suppositions particularly on key factors such as the age structure of the area. The unique nature of each district's and attendance area's demographic composition and rate of change over time must be assessed and understood to be factors throughout the life of the forecast series. Moreover, no two populations, particularly at the school district and attendance area level, have exactly the same characteristics.

The manifest purpose of these forecasts is to ascertain the demographic factors that will ultimately influence the enrollment levels in the district's schools. There are of course, other non-demographic factors that affect enrollment levels over time. These factors include, but are not limited to: transfer policies within the district, student transfers to and from neighboring districts, placement of "special programs" within school facilities that may serve students from outside the attendance area, state or federal mandates that dictate the movement of students from one facility to another (No Child Left Behind was an excellent example of this factor), the development of charter schools in the district, the prevalence of home schooling in the area, and the dynamics of local private schools.

Unless the district specifically requests the calculation of forecasts that reflect the effects of changes in these non-demographic factors, their influences are held constant for the

life of the forecasts. Again, the main function of these forecasts is to determine what impact demographic changes will have on future enrollment. It is quite possible to calculate special "scenario" forecasts to measure the impact of school policy modifications as well as planned economic and financial changes. However in this case the results of these population and enrollment forecast are meant to represent the most likely scenario for changes over the next 10 years in the district and its attendance areas.

The first part of the report will examine the assumptions made in calculating the population forecasts for the Yorktown Community Schools. Since the results of the population forecasts drive the subsequent enrollment forecasts, the assumptions listed in this section are paramount to understanding the area's demographic dynamics. The remainder of the report is an explanation and analysis of the district's population forecasts and how they will shape the district's grade level enrollment forecasts.

DATA

The data used for the forecasts come from a variety of sources. The Yorktown Community Schools provided enrollments by grade and attendance center for the school years 2012-13 to 2017-18. Birth and death data for the years 2000 through 2015 were obtained from the Indiana Department of Health. The net migration values were calculated using Internal Revenue Service migration reports for the years 2000 through 2015. The data used for the calculation of migration models came from the United States Bureau of the Census, 2005 to 2010, and the models were designed using demographic and economic factors. The base age-sex population counts used are from the results of the 2010 Census.

Recently the Census Bureau began releasing annual estimates of demographic variables at the block group and tract level from the American Community Survey (ACS). There has been wide scale reporting of these results in the national, state and local media. However, due to the methodological problems the Census Bureau is experiencing with their estimates derived from ACS data, particularly in areas with a population of less than 60,000, the results of the ACS are not used in these forecasts. For example, given the sampling framework used by the Census Bureau, each year only 160 of the over 5,700 current households in the district would have been included. For comparison 800 households in the district were included in the sample for the long form questionnaire in the 2000 Census. As a result of this small sample size, the ACS survey result from the last 5 years must be aggregated to produce the tract and block group estimates.

To develop the population forecast models, past migration patterns, current age specific fertility patterns, the magnitude and dynamics of the gross migration, the age specific mortality trends, the distribution of the population by age and sex, the rate and type of existing housing unit sales, and future housing unit construction are considered to be primary variables. In addition, the change in household size

relative to the age structure of the forecast area was addressed. While there was a slight drop in the average household size in the Yorktown Community Schools as well as most other areas of the state during the previous 20 years, the rate of this decline has been forecasted to slow over the next ten years.

ASSUMPTIONS

For these forecasts, the mortality probabilities are held constant at the levels calculated for the year 2010. While the number of deaths in an area are impacted by and will change given the proportion of the local population over age 65, in the absence of an extraordinary event such as a natural disaster or a breakthrough in the treatment of heart disease, death rates rarely move rapidly in any direction, particularly at the school district or attendance area level. Thus, significant changes are not foreseen in district's mortality rates between now and the year 2027. Any increases forecasted in the number of deaths will be due primarily to the general aging of the district's population and specifically to the increase in the number of residents aged 65 and older.

Similarly, fertility rates are assumed to stay fairly constant for the life of the forecasts. Like mortality rates, age specific fertility rates rarely change quickly or dramatically, particularly in small areas. Even with the recently reported rise in the fertility rates of the United States, overall fertility rates have stayed within a 10% range for most of the last 40 years. In fact, the vast majority of year to year change in an area's number of births is due to changes in the number of women in child bearing ages (particularly ages 20-to-29) rather than any fluctuation in an area's fertility rate.

The total fertility rate (TFR), the average number of births a woman will have while living in the school district during her lifetime, is estimated to be 1.81 for the total district for the ten years of the population forecasts. A TFR of 2.1 births per woman is considered to be the theoretical "replacement level" of fertility necessary for a population to remain constant in the absence of in-migration. Therefore, in the absence of migration, fertility alone would be insufficient to maintain the current level of population and enrollment within the Yorktown Community Schools over the course of the forecast period.

A close examination of data for the Yorktown Community Schools has shown the age specific pattern of net migration will be nearly constant throughout the life of the forecasts. While the number of in and out migrants has changed in past years for the Yorktown Community Schools (and will change again over the next 10 years), the basic age pattern of the migrants has stayed nearly the same over the last 30 years. Based on the analysis of data it is safe to assume this age specific migration trend will remain unchanged into the future. This pattern of migration shows most of the local out-migration occurring in the 18-to-24 year old age group as young adults leave the area to go to college or move to other urbanized areas. The second group of out-migrants is those householders aged 70 and older who are downsizing their residences. Most of the local in-migration occurs in the 0-to-9

and 25-to-39 age groups (the bulk of the which come from areas within 100 miles of the Yorktown Community Schools) primarily consisting of younger adults and their children.

As the Delaware County area is not currently contemplating any major expansions or contractions, the forecasts also assume that the current economic, political, social, and environmental factors, as well as the transportation and public works infrastructure (with a few notable exceptions) of the Yorktown Community Schools will remain the same through the year 2027. Below is a list of assumptions and issues that are specific to the Yorktown Community Schools. These issues have been used to modify the population forecast models to more accurately predict the impact of these factors on each area's population change. Specifically, the forecasts for the Yorktown Community Schools assume that throughout the study period:

- a. There will be no short term economic recovery in the next 18 months and the national, state or regional economy does not go into deep recession at any time during the 10 years of the forecasts; (Deep recession is defined as four consecutive quarters where the GDP contracts greater than 1% per quarter)
- b. Interest rates have reached a historic low and will not fluctuate more than one percentage point in the short term; the interest rate for a 30 year fixed home mortgage stays below 5.0%;
- c. The rate of mortgage approval stays at 1999-2003 levels and lenders do not return to "sub-prime" mortgage practices;
- d. There are no additional restrictions placed on home mortgage lenders or additional bankruptcies of major credit providers;
- e. The rate of housing foreclosures does not exceed 125% of the 2005-2007 average of Delaware County for any year in the forecasts;
- f. All currently planned, platted, and approved housing developments are built out and completed by 2026. All housing units constructed are occupied by 2027;
- g. The unemployment rates for the Delaware County and the Muncie Metropolitan Area will remain below 7.0% for the 10 years of the forecasts;
- h. The rate of students transferring into and out of the Yorktown Community Schools will remain at the 2017-18 level for the next 10 years;
- i. The inflation rate for gasoline will stay below 5% per year for the 10 years of the forecasts;
- j. There will be no building moratorium within the district;
- k. There are no changes in the state guidelines regarding school vouchers and/or inter district transfers;
- l. Businesses within the district and the Yorktown Community Schools area will remain viable;
- m. The number of existing home sales in the district that are a result of "distress sales" (homes worth less than the current mortgage value) will not exceed 20% of total homes sales in the district for any given year;

- n. Housing turnover rates (sale of existing homes in the district) will remain at their current levels. The majority of existing home sales are made by home owners over the age of 60;
- o. Private school and home school attendance rates will remain constant;
- p. The rate of foreclosures for commercial property remains at the 2004-2008 average for Delaware County;

If a major employer in the district or in the Greater Muncie Metropolitan Area closes, reduces or expands its operations, the population forecasts would need to be adjusted to reflect the changes brought about by the change in economic and employment conditions. The same holds true for any type of natural disaster, major change in the local infrastructure (e.g., highway construction, water and sewer expansion, changes in zoning regulations etc.), a further economic downturn, any additional weakness in the housing market or any instance or situation that causes rapid and dramatic population changes that could not be foreseen at the time the forecasts were calculated.

The high proportion of high school graduates from the Yorktown Community Schools that attend college or move to urban areas outside of the district for employment is a significant demographic factor. Their departure is a major reason for the extremely high out-migration in the 18-to- 24 year-old age group, and was taken into account when calculating these forecasts. The out-migration of graduating high school seniors is expected to continue over the period of the forecasts and the rate of out-migration has been forecasted to remain the same over the life of the forecast series.

Finally, all demographic trends (i.e., births, deaths, and migration) are assumed to be linear in nature and annualized over the forecast period. For example, if 1,000 births are forecasted for a 5-year period, an equal number, or proportion of the births are assumed to occur every year, 200 per year. Actual year-to-year variations do and will occur, but overall year to year trends are expected to be constant.

METHODOLOGY

The population forecasts presented in this report are the result of using the Cohort-Component Method of population forecasting (Siegel, and Swanson, 2004: 561-601) (Smith et. al. 2004). As stated in the **INTRODUCTION**, the difference between a projection and a forecast is in the use of explicit judgment based upon the unique features of the area under study. Strictly speaking, a cohort projection refers to the future population that would result if a mathematical extrapolation of historical trends. Conversely, a cohort-component forecast refers to the future population that is expected because of a studied and purposeful selection of the components of change (i.e., births, deaths, and migration) and forecast models are developed to measure the impact of these changes in each specific geographic area.

Five sets of data are required to generate population and enrollment forecasts. These five data sets are:

1. a base-year population (here, the 2010 Census population for Yorktown Community Schools);
2. a set of age-specific fertility rates for the district to be used over the forecast period;
3. a set of age-specific survival (mortality) rates for the district;
4. a set of age-specific migration rates for the district; and;
5. the historical enrollment figures by grade.

The most significant and difficult aspect of producing enrollment forecasts is the generation of the population forecasts in which the school age population (and enrollment) is embedded. In turn, the most challenging aspect of generating the population forecasts is found in deriving the rates of change in fertility, mortality, and migration. From the standpoint of demographic analysis, the Yorktown Community Schools area is classified as a “small area” population (as compared to the population of the state of Indiana or to that of the United States). Small area population forecasts are more complicated to calculate because local variations in fertility, mortality, and migration may be more irregular than those at the regional, state or national scale. Especially challenging is the forecast of the migration rates for local areas, because changes in the area's socioeconomic characteristics can quickly change from past and current patterns (Peters and Larkin, 2002.)

The population forecasts for Yorktown Community Schools were calculated using a cohort-component method with the populations divided into male and female groups by five-year age cohorts that range from 0-to-4 years of age to 85 years of age and older (85+). Age- and sex-specific fertility, mortality, and migration models were constructed to specifically reflect the unique demographic characteristics of each of the attendance areas in the Yorktown Community Schools.

The enrollment forecasts were calculated using a modified average survivorship method. Average survivor rates (i.e., the proportion of students who progress from one grade level to the next given the average amount of net migration for that grade level) over the previous five years of year-to-year enrollment data were calculated for grades two through twelve. This procedure is used to identify specific grades where there are large numbers of students changing facilities for non-demographic factors, such as private school transfers or enrollment in special programs.

The survivorship rates were modified or adjusted to reflect the average rate of forecasted in and out migration of 5-to-9, 10-to-14 and 15-to-17 year old cohorts to each of the attendance centers in Yorktown Community Schools for the period 2012 to 2017. These survivorship rates then were adjusted to reflect the forecasted changes in age-specific migration the district should experience over the next five years. These modified survivorship rates were used to project

the enrollment of grades 2 through 12 for the period 2018 to 2022. The survivorship rates were adjusted again for the period 2023 to 2027 to reflect the predicted changes in the amount of age-specific migration in the district for the period.

The forecasted enrollments for kindergarten and first grade are derived from the 5-to-9 year old population of the age-sex population forecast at the elementary attendance center district level. This procedure allows the changes in the incoming grade sizes to be factors of forecasted population change and not an extrapolation of previous class sizes. Given the potentially large amount of variation in kindergarten enrollment due to parental choice, changes in the state's minimum age requirement, and differing district policies on allowing children to start kindergarten early, first grade enrollment is deemed to be a more accurate and reliable starting point for the forecasts. (McKibben, 1996) The level of the accuracy for both the population and enrollment forecasts at the school district level is estimated to be $\pm 2.0\%$ for the life of the forecasts.

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Appendix A: Supplemental Tables

Table 1: Forecasted District Population Change, 2010 to 2020

	2010	2015	2010-2015 Change	2020	2015-2020 Change	2010-2020 Change
Yorktown Comm. Schools	14,102	14,170	0.5%	14,180	0.1%	0.6%

Table 2: Household Characteristics by Elementary Area, 2010 Census

	HH w/ Pop Under 18	% HH w/ Pop Under 18	Total Households	Household Population	Persons Per Household
Yorktown Comm. Schools	1,820	32.0%	5,609	14,102	2.45

Table 3: Householder Characteristics by Elementary Area, 2010 Census

	Percentage of Householders aged 35-54	Percentage of Householders aged 65+	Percentage of Householders Who Own Homes
Yorktown Comm. Schools	36.7%	26.6%	74.0%

Table 4: Percentage of Households that are Single Person Households and Single Person Households that are over age 65 by Elementary Area , 2010 Census

	Percentage of Single Person Households	Percentage of Single Person Households and are 65+
Yorktown Comm. Schools	24.0%	10.3%

Table 5: Elementary Enrollment (K-5), 2017, 2022, 2027

	2017	2022	2017-2022 Change	2027	2022-2027 Change	2017-2027 Change
Yorktown Comm. Schools	1,217	1,225	0.7%	1,186	-3.2%	-2.5%

Table 6: Age Under One to Age Ten Population Counts, by Year of Age, by Elementary Area: 2010 Census

	Under 1 year	1 year	2 years	3 years	4 years	5 years	6 years	7 years	8 years	9 years	10 years
Yorktown Comm. Schools	158	152	185	155	181	178	197	185	182	185	199

Appendix B: Population Forecast

Yorktown Community Schools: Total Population

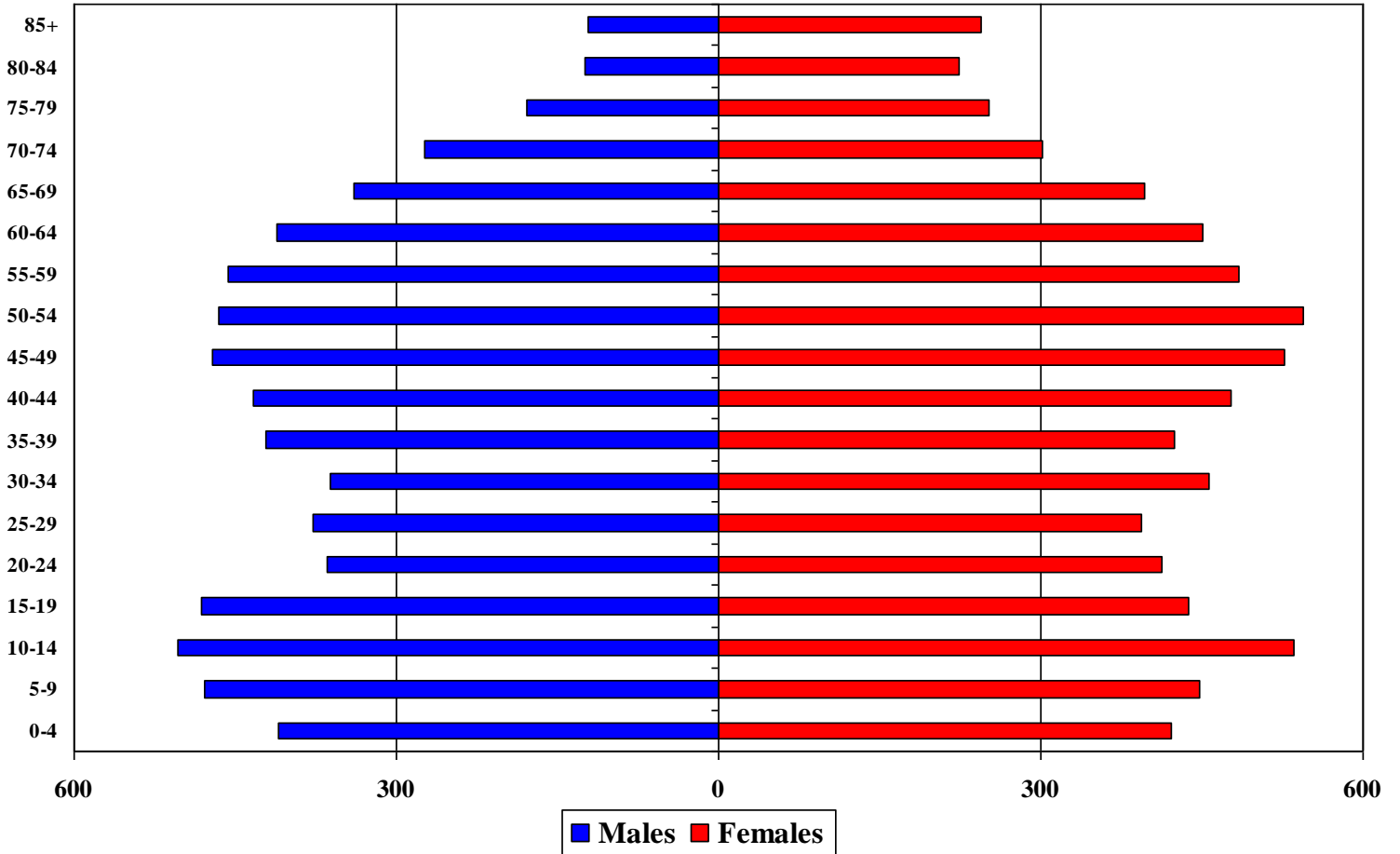
Total	2010	2015	2020	2025
0-4	831	810	800	760
5-9	927	850	920	870
10-14	1,040	930	870	930
15-19	919	1,010	890	850
20-24	777	750	730	710
25-29	770	810	780	750
30-34	818	810	840	800
35-39	846	870	860	880
40-44	910	840	900	860
45-49	998	900	830	880
50-54	1,009	980	890	820
55-59	942	980	960	870
60-64	861	910	950	930
65-69	736	790	840	880
70-74	574	650	700	760
75-79	430	510	560	610
80-84	349	350	400	460
85+	365	420	460	510
Total	14,102	14,170	14,180	14,130
Median Age	40.7	41.5	42.2	43.0

	2010 to 2015	2015 to 2020	2020 to 2025
Births	790	770	740
Deaths	640	690	750
Natural Increase	150	80	-10
Net Migration	-70	-70	-60
Change	80	10	-70

Differences between period Totals may not equal Change due to rounding.

Appendix C: Population Pyramid

Yorktown Community Schools Total Population - 2010 Census



Appendix D: Enrollment Forecast

Yorktown Community Schools: Total Enrollment

	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27	2027-28
K	169	199	173	211	185	208	204	203	204	202	201	199	198	197	195	196
1	162	179	188	169	217	201	211	210	209	208	206	205	203	202	201	199
2	150	169	185	204	177	219	215	209	208	207	206	204	203	201	200	199
Total: K-2	481	547	546	584	579	628	630	622	621	617	613	608	604	600	596	594

3	169	163	180	185	201	190	173	211	207	206	205	204	202	201	199	198
4	173	171	169	183	191	204	197	170	209	205	204	203	202	200	199	197
5	163	181	181	161	195	195	187	193	168	207	203	202	201	200	198	197
Total: 3-5	505	515	530	529	587	589	557	574	584	618	612	609	605	601	596	592

6	202	176	204	188	173	193	191	183	191	166	205	201	200	199	198	196
7	180	205	179	206	198	182	171	189	179	187	163	201	197	198	197	196
8	165	187	213	183	210	196	196	169	187	177	185	161	199	195	196	195
Total: 6-8	547	568	596	577	581	571	558	541	557	530	553	563	596	592	591	587

9	194	182	216	219	201	213	212	198	172	191	181	189	164	205	201	202
10	215	188	186	214	223	197	199	210	196	170	189	179	187	162	203	199
11	206	209	185	183	201	203	212	189	200	186	162	180	170	178	154	193
12	181	204	201	174	175	190	195	206	183	194	180	157	175	165	173	149
Total: 9-12	796	783	788	790	800	803	818	803	751	741	712	705	696	710	731	743
Total: K-12	2,329	2,413	2,460	2,480	2,547	2,591	2,563	2,540	2,513	2,506	2,490	2,485	2,501	2,503	2,514	2,516

Total: K-12	2,329	2,413	2,460	2,480	2,547	2,591	2,563	2,540	2,513	2,506	2,490	2,485	2,501	2,503	2,514	2,516
Change		84	47	20	67	44	-28	-23	-27	-7	-16	-5	16	2	11	2
% Change		3.6%	1.9%	0.8%	2.7%	1.7%	-1.1%	-0.9%	-1.1%	-0.3%	-0.6%	-0.2%	0.6%	0.1%	0.4%	0.1%

Total: K-2	481	547	546	584	579	628	630	622	621	617	613	608	604	600	596	594
Change		66	-1	38	-5	49	2	-8	-1	-4	-4	-5	-4	-4	-4	-2
% Change		13.7%	-0.2%	7.0%	-0.9%	8.5%	0.3%	-1.3%	-0.2%	-0.6%	-0.6%	-0.8%	-0.7%	-0.7%	-0.7%	-0.3%

Total: 3-5	505	515	530	529	587	589	557	574	584	618	612	609	605	601	596	592
Change		10	15	-1	58	2	-32	17	10	34	-6	-3	-4	-4	-5	-4
% Change		2.0%	2.9%	-0.2%	11.0%	0.3%	-5.4%	3.1%	1.7%	5.8%	-1.0%	-0.5%	-0.7%	-0.7%	-0.8%	-0.7%

Total: 6-8	547	568	596	577	581	571	558	541	557	530	553	563	596	592	591	587
Change		21	28	-19	4	-10	-13	-17	16	-27	23	10	33	-4	-1	-4
% Change		3.8%	4.9%	-3.2%	0.7%	-1.7%	-2.3%	-3.0%	3.0%	-4.8%	4.3%	1.8%	5.9%	-0.7%	-0.2%	-0.7%

Total: 9-12	796	783	788	790	800	803	818	803	751	741	712	705	696	710	731	743
Change		-13	5	2	10	3	15	-15	-52	-10	-29	-7	-9	14	21	12
% Change		-1.6%	0.6%	0.3%	1.3%	0.4%	1.9%	-1.8%	-6.5%	-1.3%	-3.9%	-1.0%	-1.3%	2.0%	3.0%	1.6%

Forecasts Developed October 2017
 Green Cells (2017-18 and earlier) are historical data
 Blue Cells (2018-19 and later) are forecasted years