APPENDIX C: DEMOGRAPHICS + 2050 GROWTH SCENARIO

DEMOGRAPHICS AND 2050 GROWTH SCENARIO

This appendix summarizes current socioeconomic conditions in the Greater Des Moines area and provides a forecast of future socioeconomic conditions, also known as a growth scenario.

Current Socioeconomic Conditions

The Des Moines Area MPO collects and reviews a variety of socioeconomic datasets in order to analyze the MPA's transportation needs. By collecting and analyzing socioeconomic data, the Des Moines Area MPO identifies where residents live, work, shop, and travel.

General Demographic Characteristics

Figure C1 identifies growth trends in the Des Moines-West Des Moines MSA counties from 1990 to 2018. Polk County continues to possess the largest population base in the Des Moines-West Des Moines MSA. Dallas County has experienced the largest percentage of population growth from 1990 to 2018. **Figure C3** provides a demographic profile of Dallas, Polk, and Warren Counties from the 2010 Census.

FIGURE C1: HISTORICAL AND ESTIMATED POPULATION, 1990-2018

	1990	2000	2010	2018 ESTIMATE	1990 − 2018 GROWTH
State of Iowa	2,776,755	2,926,324	3,046,355	3,156,145	379,390
Des Moines - West Des Moines MSA	416,346	481,394	569,633	623,113*	206,767
Dallas Co.	29,755	40,750	66,135	90,180	60,425
Guthrie Co.	10,935	11,353	10,954	10,720	-215
Madison Co.	12,483	14,019	15,679	16,249	3,766
Polk Co.	327,140	374,601	430,640	487,204	160,064
Warren Co.	36,033	40,671	46,225	51,056	15,023

Source: US Census Bureau 2018 Population Estimate (*2017 ACS 5-Year Population Estimate)

FIGURE C3 GENERAL DEMOGRAPHIC CHARACTERISTICS OF DALLAS, POLK, AND WARREN COUNTIES

	DALLAS COUNTY	POLK COUNTY	WARREN COUNTY
Total Population	80,864	467,235	48,630
Male	39,934	229,864	23,679
Female	40,930	237,371	24,951
Age			
5-14 Years	13,038	65,361	7,055
15-64 Years	52,233	311,512	31,384
65 Years and Over	9,104	56,639	7,264
Race			
White	75,390	406,899	47,724
Black or African American	2,026	37,858	522
American Indian and Alaska Native	457	3,816	263
Asian	3,842	23,715	463
Native Hawaiian and Other Pacific Islander	99	689	214
Other	854	7,756	310
Two or More Races	1,721	12,960	805
Hispanic or Latino	4,942	37,937	1,268

Source: US Census Bureau American Community Survey, 2013-2017 5-Year Estimates

Housing Characteristics

Figure C4 provides a housing profile of Dallas, Polk, and Warren Counties. Over 25 percent (63,135) of all housing units were built after 2000 and the region has a 94 percent occupancy rate. Approximately five percent of the three counties of the greater Des Moines metropolitan area's occupied housing units (households) do not have access to a vehicle, and 20 percent of the households have access to more than three vehicles.

FIGURE C4: SELECTED HOUSING CHARACTERISTICS FOR DALLAS, POLK, AND WARREN COUNTIES

	DALLAS COUNTY	MARGIN OF ERROR	POLK COUNTY	MARGIN OF ERROR	WARREN COUNTY	MARGIN OF ERROR
Housing Occupancy						
Total Housing Units	33,265	88	193,987	224	19,426	91
Occupied Housing Units	31,363	389	181,316	900	18,621	202
Vacant Housing Units	1,902	379	12,671	887	805	195
Homeowner Vacancy Rate	1	1	1	0	1	0
Rental Vacancy Rate	5	2	5	1	2	2
Year Built						
Before 1959	5,629	224	61,983	805	4,328	179
1960 - 2000	10,827	297	91,169	914	11,157	228
After 2000	16,809	485	40,835	830	5,491	183
Vehicles Available						
No Vehicles Available	946	389	10,829	680	666	162
1 Vehicle Available	8,674	171	57,566	1,386	4,704	324
2 Vehicles Available	14,187	538	75,322	1,435	7,626	392
3 or More Vehicles Available	7,556	584	37,589	1,175	5,625	325
Value						
Median Household Income	$218,000	$5,156	$165,500	$1,351	$171,400	$3,437

Source: US Census Bureau American Community Survey, 2013-2017 5-year Estimates

Economic Characteristics

Figure C5 provides an economic profile of Dallas, Polk, and Warren Counties. The three counties of the greater Des Moines metropolitan area, Dallas, Polk, and Warren Counties, employ approximately 69 percent of the persons aged 16 years and over. Of the workers aged 16 years and over, 79 percent commute to work in a single-occupant car, truck, or van.

FIGURE C5: ECONOMIC CHARACTERISTICS FOR DALLAS, POLK, AND WARREN COUNTIES

	DALLAS COUNTY	MARGIN OF ERROR	POLK COUNTY	MARGIN OF ERROR	WARREN COUNTY	MARGIN OF ERROR
Employment Status						
Population 16 Years and Over	60,395	155	362,001	655	37,784	132
In Labor Force	45,488	612	263,038	1,510	26,693	323
Civilian Labor Force	45,401	613	262,529	1,508	26,653	332
Employed	44,329	668	250,105	1,692	25,633	346
Unemployed	1,072	258	12,424	843	1,020	206
Armed Forces	87	52	509	199	40	41
Not in Labor Force	14,907	597	98,963	1,471	11,091	344
Commuting to Work						
Workers 16 Years and Over	43,887	675	245,995	1,890	25,345	351
Car, Truck, or Van -- Drove Alone	37,637	832	206,252	2,307	21,278	496
Car, Truck, or Van -- Carpooled	3,135	439	20,135	1,014	1,685	274
Public Transportation (Excluding Taxicab)	79	49	3,431	424	56	46
Walked	572	163	4,434	536	766	156
Other Means	262	99	2,543	349	101	51
Worked at Home	2,202	302	9,200	728	1,459	223

Source: US Census Bureau American Community Survey, 2013-2017 5-year Estimates

2050 Growth Scenario

Summary

A long-range transportation plan (LRTP) must project transportation demand for persons and goods over the period of the plan. To complete this task, the MPO must develop a growth scenario that forecasts housing and employment growth out to the plan's horizon year and identifies where this growth will likely occur.   The growth scenario process is important in that it feeds into the MPO's travel-demand model. The model is used to estimate traffic flows into the future and helps to inform planning decisions.

Figure C6 shows the total growth for housing units and employment that was used for the growth scenario. The following appendix outlines how staff arrived at these numbers.

Steps to Develop the Growth Scenario

The following steps were undertaken to develop the 2050 Growth Scenario.

1. Established base-year population and employment data for the MPO planning area and individual jurisdictions;

2. Determined employment growth allocations out to 2050 for each subarea;

3. Determined population growth allocations out to 2050 for each jurisdiction;

4. Work with community representatives to assign their allocated growth using the Envision Tomorrow software; and,

5. Aggregate allocated growth to TAZs for use in the travel-demand model.

FIGURE C6: HOUSING UNIT AND EMPLOYMENT GRWOTH TOTALS

JURISDICTION	HOUSING UNITS	EMPLOYMENT
Altoona	5,509	5,396
Ankeny	22,878	12,069
Bondurant	4,640	1,508
Carlisle	595	832
Clive	3,260	3,792
Des Moines	13,663	100,022
Grimes	3,959	3,543
Johnston	9,642	6,333
Mitchellville	18	313
Norwalk	3,319	3,371
Pleasant Hill	3,847	2,191
Polk City	1,222	410
Urbandale	12,319	14,087
Waukee	10,470	7,108
West Des Moines	17,469	34,187
Windsor Heights	70	1,341
Dallas County	-	-
Polk County	2,883	8,424
Warren County	-	-
TOTAL	**115,763**	**204,927**

Detailed Methodology

The following section provides a more in-depth explanation of the process and methodology used to develop the final 2050 Growth Scenario.

Geography

The 2050 Growth Scenario includes multiple steps that involves the collection, aggregation, and/or forecasting of data at a variety of geographic levels. The following is an explanation of the geographic levels used throughout the growth scenario process.

- Four-county level: The MPO's Metropolitan Planning Area (MPA) resides is parts of Polk, Dallas, Warren, and Madison Counties, which are referred to throughout this document as the four-county level. Woods & Poole data is provided at the county level and, therefore, must be adjusted to provide Planning Area data.

- Metropolitan Planning Area (MPA): The MPA includes areas within Polk, Dallas, Warren, and Madison Counties that are expected to be urbanized by the year 2050

- Subarea: The MPO's MPA boundary is divided into seven subareas. These subareas were established during The Tomorrow Plan's development based on interviews with real estate and community development/economic development professionals, consideration of symbolic and physical boundaries, analysis of real estate supply data and development trends, and previous subareas used by the MPO.

- Traffic Analysis Zone: The MPA is divided into more than 1,000 TAZ for use in travel-demand modeling.

- Parcel-Based Geography: Base-year employment data and future year growth assignments were completed using parcel-based geography. These geographies were based upon land parcels. To limit the size of parcels, a one-acre layer was placed over the parcel map which resulted in the subdivision of some parcels.
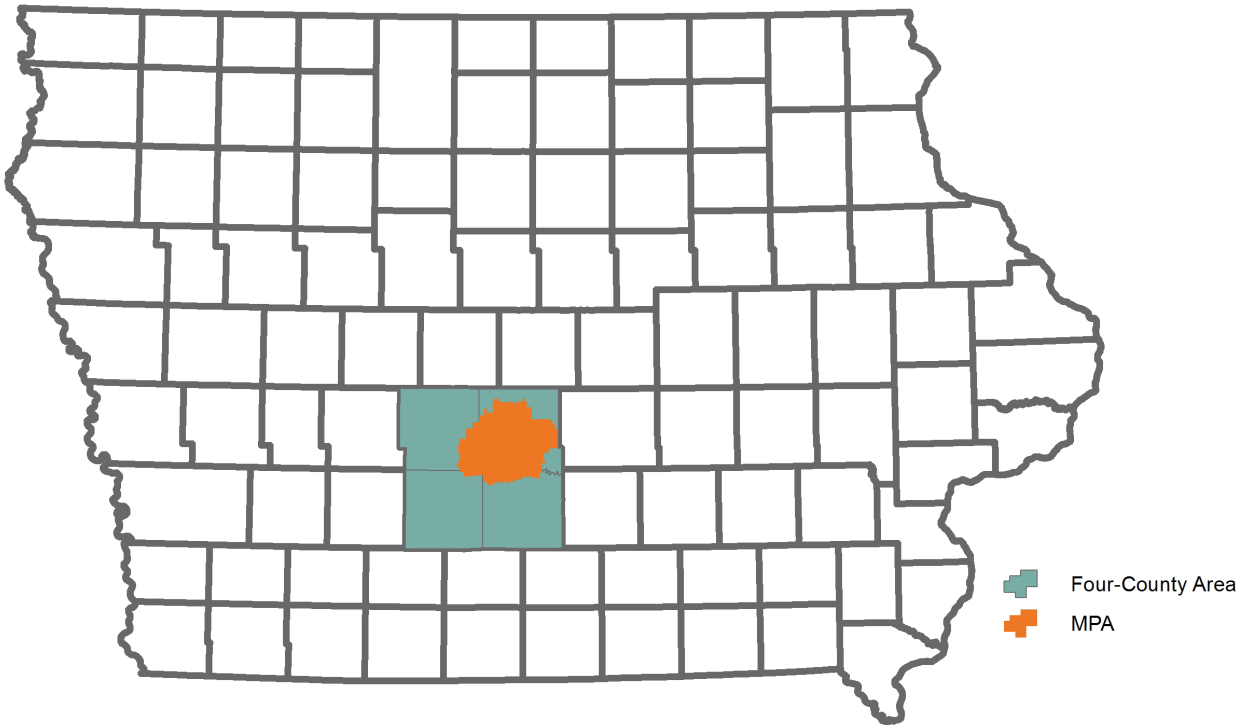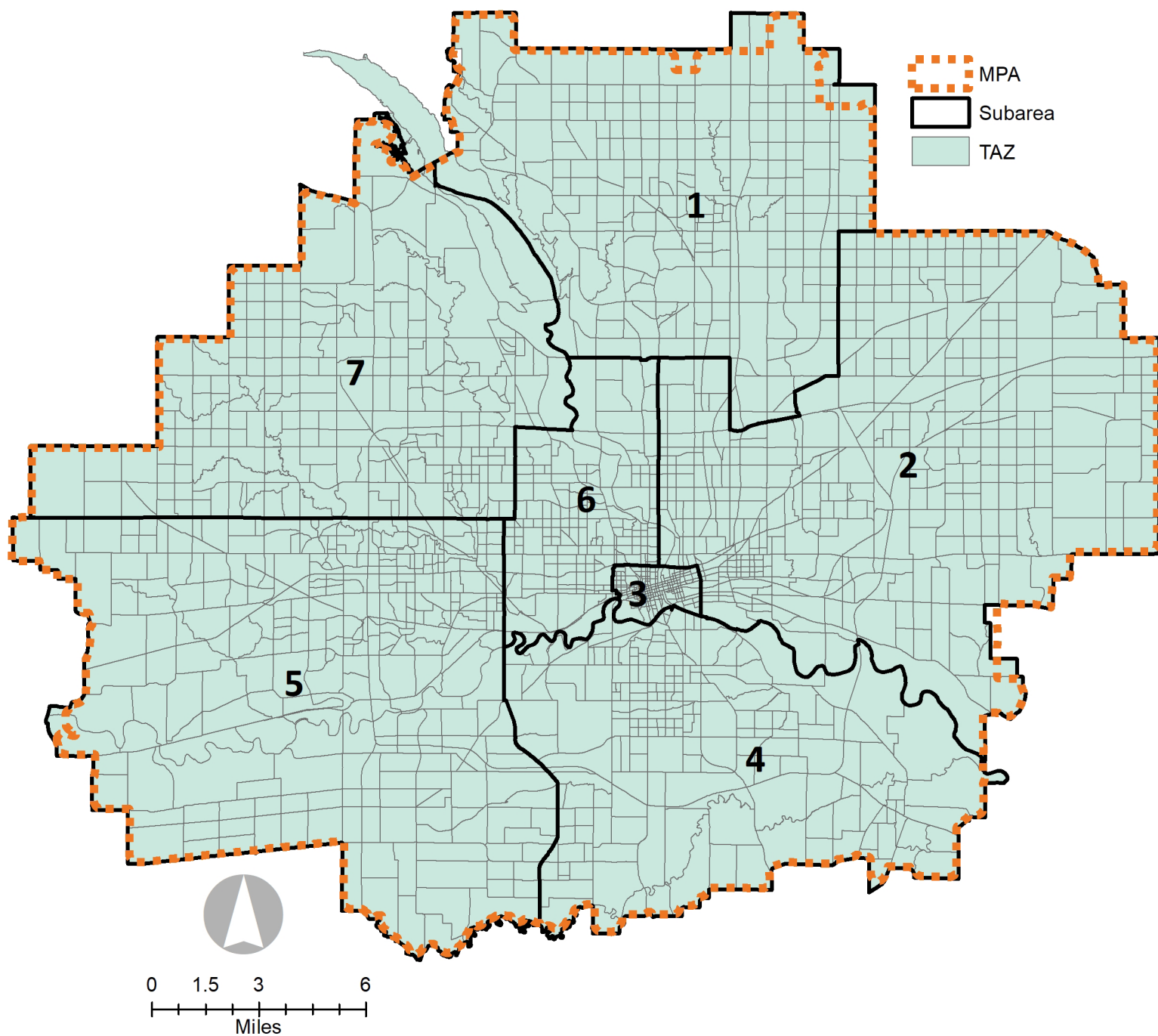
FIGURE C7: FOUR-COUNTY AREA AND MPA GEOGRAPHIES

Four-County Area
MPA

Legend:
- MPA
- Subarea
- TAZ

0 1.5 3 6
Miles

Step 1: Establish Base-Year Population and Employment Data

MPO staff collected data for housing units and employment that was current as of 2016, which serves as the base year. Housing unit information was collected from each county assessor's parcel database and were aggregated to each jurisdiction. Base employment data was collected from the parcel database using the ratios outlined in **Figure C9**.

Employment was estimated following a parcel-based methodology. MPO staff collected GIS information for commercial and industrial use parcels within each county. Information collected included the parcel size, detailed occupancy, building area, height, and age of the building. The detailed occupancy information was used to categorize each parcel into one of 10 categories, and a jobs-per-square-foot ratio was applied to each building, as illustrated in **Figure C9.** Mixed-use buildings were addressed as well by identifying parcels with a mix of uses and estimating the percentage of each building's area attributed to each use. Employment for each parcel was calculated by taking the building area, multiplied by the number of floors, multiplied by the jobs-per-square-foot ratio.

FIGURE C9: EMPLOYMENT RATIOS BY CATEGORY

USE CATEGORY	JOBS/SQFT RATIO
Education	969
Hospital	385
Hotel	3,000
Manufacturing	750
Office	250
Public Assembly	1,400
Religious Worship	2,000
Retail	500
Senior Care	1,000
Warehouse/Flex	1,250

FIGURE C10: BASE YEAR HOUSING AND EMPLOYMENT

JURISDICTION	HOUSING UNITS	EMPLOYMENT
Altoona	7,238	10,779
Ankeny	25,516	24,152
Bondurant	2,088	1,020
Carlisle	1,689	1,425
Clive	7,041	15,406
Des Moines	95,044	197,156
Grimes	5,127	5,565
Johnston	8,347	12,648
Mitchellville	767	632
Norwalk	4,461	2,341
Pleasant Hill	3,984	4,381
Polk City	1,779	832
Urbandale	17,666	28,048
Waukee	8,133	5,409
West Des Moines	29,061	67,946
Windsor Heights	2,330	3,441
Dallas County	1,625	452
Polk County	9,453	15,761
Warren County	1,386	779
TOTAL	**232,735**	**398,173**

Step 2: Determine Subarea Employment Forecasts

The methodology used to forecast employment is based upon analysis of Woods & Poole forecasts by county. Woods & Poole employment forecasts for the four-county area were obtained. The Woods & Poole projections were collected for 2016, 2020, 2025, 2030, 2035, 2040, 2045, and 2050. The four-county projected totals were used to develop an average growth rate for each of the listed timeframes. A key assumption was that the growth rate forecasted at the county level also would be observed at the MPA level for each of the subareas. The growth rate for each time period was used to develop the employment projections for each of the seven subareas in the MPA.

FIGURE C11: EMPLOYMENT PROJECTIONS BY COUNTY

COUNTY	2016	2020	2025	2030	2035	2040	2045	2050
Polk	362,100	383,090	408,056	432,710	454,430	473,890	491,570	507,530
Dallas	56,766	63,597	72,894	80,870	93,442	104,750	116,980	130,260
Madison	6,974	7,220	7,501	7,742	7,940	8,100	8,237	8,356
Warren	18,821	19,768	20,947	22,075	23,116	24,098	25,032	25,914
Totals	444,661	473,675	509,398	543,397	578,928	610,838	641,819	672,060

FIGURE C12: COUNTY GROWTH RATES BY TIME PERIOD

	2016-2020	2021-2025	2026-2030	2031-2035	2036-2040	2041-2044	2046-2050
Polk	1.133	1.271	1.180	0.984	0.842	0.735	0.641
Dallas	2.299	2.766	2.098	2.932	2.311	2.233	2.174
Madison	0.696	0.767	0.634	0.506	0.400	0.336	0.287
Warren	0.987	1.165	1.055	0.926	0.836	0.763	0.695
4-County Average	1.272	1.465	1.301	1.275	1.079	0.994	0.925
Growth Rate for Time Period	6.361	7.324	6.503	6.374	5.394	4.972	4.625

FIGURE C13: EMPLOYMENT PROJECTIONS BY SUBAREA

COUNTY	2016	2020	2025	2030	2035	2040	2045	2050
1	27,680	29,441	31,597	33,652	35,797	37,728	39,603	41,435
2	54,639	58,115	62,371	66,427	70,661	74,473	78,175	81,791
3	90,876	96,657	103,736	110,482	117,524	123,863	130,022	136,036
4	31,589	33,598	36,059	38,404	40,852	43,056	45,196	47,287
5	92,705	98,602	105,824	112,705	119,889	126,356	132,639	138,774
6	49,160	52,287	56,117	59,766	63,575	67,005	70,336	73,590
7	51,524	54,801	58,815	62,640	66,633	70,227	73,719	77,128
Total	398,173	423,501	454,518	484,075	514,930	542,707	569,691	596,041

The next step involved breaking each subarea down by the jurisdictions located in that subarea. For the purpose of projecting employment for each jurisdiction, it was assumed that each jurisdiction would retain its 2016 base year percentage of each subarea's employment. **Figure C14** shows the final employment projections for each jurisdiction.

FIGURE C14: EMPLOYMENT PROJECTIONS BY JURISDICTION

JURISDICTION	2016 BASE YEAR	2020	2030	2040	2050	TOTAL GROWTH BY JURISDICTION
Altoona	10,779	11,465	13,104	14,692	16,136	5,357
Ankeny	24,152	25,688	29,363	32,919	36,154	12,002
Bondurant	1,020	1,085	1,240	1,390	1,527	507
Carlisle	1,425	1,516	1,732	1,942	2,133	708
Clive	15,406	16,386	18,730	20,998	23,062	7,656
Des Moines	197,156	209,697	239,691	268,722	295,131	97,975
Grimes	5,565	5,919	6,766	7,585	8,330	2,765
Johnston	12,648	13,453	15,377	17,239	18,933	6,285
Mitchellville	632	672	768	861	946	314
Norwalk	2,341	2,490	2,846	3,191	3,504	1,163
Pleasant Hill	4,381	4,660	5,326	5,971	6,558	2,177
Polk City	832	885	1,011	1,134	1,245	413
Urbandale	28,048	29,832	34,099	38,229	41,986	13,938
Waukee	5,409	5,753	6,576	7,372	8,097	2,688
West Des Moines	67,946	72,268	82,605	92,610	101,711	33,765
Windsor Heights	3,441	3,660	4,183	4,690	5,151	1,710
Dallas County	452	481	550	616	677	225
Polk County	15,761	16,764	19,161	21,482	23,593	7,832
Warren County	779	829	947	1,062	1,166	387
TOTAL	**398,173**	**423,501**	**484,075**	**542,707**	**596,041**	**197,868**

Step 3: Determine Housing Unit Forecasts by Jurisdiction

The MPO developed a methodology to project housing units using data from the U.S. Census Bureau. Housing unit data from the 2000 Census and 2016 Census Estimate was collected and compared to determine an average annual growth rate over the 16-year period for each of the MPO jurisdictions.

FIGURE C15: HOUSING UNIT GROWTH RATES BY JURISDICTION

JURISDICTION	2000	2016	GROWTH RATE (%)	GROWTH RATE CATEGORY
Altoona	3,959	6,374	3.02	Low
Ankeny	10,339	21,261	4.61	High
Bondurant	682	1,693	5.85	High
Carlisle	1,379	1,635	1.07	Low
Clive	4,902	6,788	2.06	Low
Des Moines	85,067	90,437	0.38	Low
Grimes	1,958	3,733	4.12	High
Johnston	3,406	8,070	5.54	High
Mitchellville	675	684	0.08	Low
Norwalk	2,382	3,813	2.98	Low
Pleasant Hill	1,966	3,788	4.18	High
Polk City	842	1,389	3.18	High
Urbandale	11,869	17,066	2.30	Low
Waukee	2,087	6,470	7.33	High
West Des Moines	20,815	28,298	1.94	Low
Windsor Heights	2,222	2,161	-0.17	Low
Dallas County	n/a	n/a	0.87	n/a
Polk County	n/a	n/a	0.87	n/a
Warren County	n/a	n/a	0.87	n/a
MPA	**n/a**	**n/a**	**3.03**	**n/a**
Low Growth Avg.	**n/a**	**n/a**	**1.52**	**n/a**

The MPO jurisdictions were divided into two growth categories – high growth and low growth. A jurisdiction was considered high growth if its growth rate was higher than the growth rate for the MPA. All other jurisdictions fell into the low-growth category. An average growth rate was also developed for the low-growth category. The average annual growth rate was used to calculate the amount of annual growth that could be expected for each jurisdiction. This annual growth was used to develop a straight-line project for future housing unit growth. However, it was assumed that many of the jurisdictions would not sustain their current growth through the duration of the plan. Therefore, the housing unit projections were divided into three time periods, 2017-2029, 2030-2039, and 2040-2050.

FIGURE C16: ADJUSTED HOUING UNIT GROWTH BY TIME

JURISDICTION	GROWTH RATE 2017-2029	ANNUAL GROWTH 2017-2029	GROWTH RATE 2030-2039	ANNUAL GROWTH 2030-2039	GROWTH RATE 2040-2050	ANNUAL GROWTH 2040-2050
Altoona	3.02%	193	3.02%	193	1.52%	97
Ankeny	4.61%	980	3.03%	644	1.52%	323
Bondurant	5.85%	99	3.03%	51	1.52%	26
Carlisle	1.07%	17	1.07%	17	1.07%	17
Clive	2.06%	140	2.06%	140	1.52%	103
Des Moines	0.38%	347	0.38%	347	0.38%	347
Grimes	4.12%	154	3.03%	113	1.52%	57
Johnston	5.54%	447	3.03%	244	1.52%	122
Mitchellville	0.08%	1	0.08%	1	0.08%	1
Norwalk	2.98%	114	2.98%	114	1.52%	58
Pleasant Hill	4.18%	158	3.03%	115	1.52%	57
Polk City	3.18%	44	3.03%	42	1.52%	21
Urbandale	2.30%	392	2.30%	392	1.52%	259
Waukee	7.33%	474	3.03%	196	1.52%	98
West Des Moines	1.94%	548	1.94%	548	1.52%	429
Windsor Heights	-0.17%	(4)	-0.17%	(4)	-0.17%	(4)
Dallas County	0.87%	14	0.87%	14	0.87%	14
Polk County	0.87%	82	0.87%	82	0.87%	82
Warren County	0.87%	12	0.87%	12	0.87%	12

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In the 2017-2029 time period, the average growth rate from 2000-2016 was used for each jurisdiction. In the subsequent time periods, adjustments were made to reduce the growth rate for some jurisdictions. In the 2030-2039 time period, the growth rate was reduced to the MPA rate of 3.03 percent for the jurisdictions in the high-growth category. In the 2040-2050 time period, the growth rate was reduced to the Low-Growth Average of 1.52 percent for the jurisdictions with growth rates higher than the Low-Growth Average.

FIGURE C17: HOUSING UNIT PROJECTIONS BY

JURISDICTION	2016 BASE YEAR	2020	2030	2040	2050	TOTAL GROWTH BY JURISDICTION
Altoona	7,238	8,008	9,934	11,764	12,731	5,493
Ankeny	25,516	29,436	38,899	45,017	48,243	22,727
Bondurant	2,088	2,484	3,426	3,913	4,170	2,082
Carlisle	1,689	1,759	1,934	2,109	2,284	595
Clive	7,041	7,599	8,994	10,353	11,383	4,342
Des Moines	95,044	96,431	99,897	103,364	106,831	11,787
Grimes	5,127	5,742	7,237	8,311	8,878	3,751
Johnston	8,347	10,135	14,403	16,725	17,949	9,602
Mitchellville	767	769	775	781	786	19
Norwalk	4,461	4,916	6,054	7,136	7,714	3,253
Pleasant Hill	3,984	4,618	6,159	7,249	7,824	3,840
Polk City	1,779	1,956	2,395	2,795	3,005	1,226
Urbandale	17,666	19,233	23,151	26,936	29,526	11,860
Waukee	8,133	10,029	14,492	16,354	17,336	9,203
West Des Moines	29,061	31,255	36,739	42,104	46,398	17,337
Windsor Heights	2,330	2,315	2,277	2,240	2,202	(128)
Dallas County	1,625	1,681	1,822	1,963	2,104	479
Polk County	9,453	9,781	10,600	11,420	12,240	2,787
Warren County	1,386	1,434	1,554	1,674	1,795	409
TOTAL	232,735	249,581	290,744	322,207	343,398	110,663

The Woods & Poole population projection for 2050 is 822,886 for the four-county level. This number was used as a control target with an objective of keeping the MPA population projection below the four-county total. Specific household size and vacancy rate for each jurisdiction were taken from the 2010 Census and used to convert the projected housing units to a population number that could be compared to the Woods & Poole projection for 2050. The converted MPA population number for 2050 is 810,294. This meets the objective of staying under the Woods & Poole four-county level projection.

Step 4: Meet with Jurisdictions to Allocated Growth

Each jurisdiction used its control total from Steps 2 & 3 to allocate growth through the region. To aid in this process, the MPO staff used the scenario planning software Envision Tomorrow. Envision Tomorrow is a free tool that integrates an ArcGIS mapping extension with Microsoft Excel files. The user is able to "paint" areas on a map with different land uses. Each land use can contain different building types and development densities, which are then used to calculate population and employment growth.

MPO staff set up a template for each community and worked with the MPO's Planning Subcommittee to develop general land uses for each community to use. MPO staff also set up a geodatabase built off county assessor records. As noted in the discussion of geography earlier in document, a one-acre grid was placed over the parcel map which resulted in the subdivision of some parcels in order to keep parcel sizes at around one acre. Constrained land uses also were identified based on sensitive area information collected through The Tomorrow Plan's development which would not allow them to be developed.

MPO staff then met with representatives from most all communities to identify areas of growth and/or redevelopment within their jurisdictions. Community representatives were able to "paint" development or redevelopment until their allotment of growth was expended. In some cases, communities could exceed their projected allotment based on their intimate knowledge of growth in their community. Due to this factor, staff set an allocation target not to exceed the projected numbers by more than 5 percent. **Figure C18** shows the per acre housing unit/employment densities used for each of the development patterns.

Figure C19 shows the final allocated growth for housing and employment for each of the jurisdictions. Dallas County and Warren County show no growth as it was assumed that the growth areas in these counties would fall into areas taken up by the future expansion of the municipalities.

Figure C20 shows a comparison of projected housing and employment compared to the final allocated growth. The final allocated growth totals for housing and employment stayed below the 5 percent target threshold.

FIGURE C18: HOUISNG AND EMPLOYMENT DENSITIES BY DEVELOPMENT TYPE

USE CATEGORY	HOUSING UNIT/GROSS ACRE	JOBS/GROSS ACRE
CBD Urban Residential	16.4	-
Urban Residential	8.2	-
Suburban Residential	4.1	-
Rural Residential	0.6	-
Retail	-	12.8
CBD Office	-	141.9
Office	-	27.1
Industrial	-	12.3
Public/Civic	-	27.1
Education	-	27.1
Hotel/Hospitality	-	17.2
Downtown Node	36.3	16.4
Regional Node	65.4	16.4
Community Node	24.5	16.4
Neighborhood Node	14.7	16.4

FIGURE C19 ALLOCATED HOUSING AND EMPLOYMENT BY JURISDICTION

JURISDICTION	TOTAL HOUSING UNIT GROWTH	TOTAL EMPLOYMENT GROWTH
Altoona	5,509	5,396
Ankeny	22,878	12,069
Bondurant	4,640	1,508
Carlisle	595	832
Clive	3,260	3,792
Des Moines	13,663	100,022
Grimes	3,959	3,543
Johnston	9,642	6,333
Mitchellville	18	313
Norwalk	3,319	3,371
Pleasant Hill	3,847	2,191
Polk City	1,222	410
Urbandale	12,319	14,087
Waukee	10,470	7,108
West Des Moines	17,469	34,187
Windsor Heights	70	1,341
Dallas County	-	-
Polk County	2,883	8,424
Warren County	-	-
Total	**115,763**	**204,927**

FIGURE C20: PROJECTED VS. ALLOCATED HOUSING AND EMPLOYMENT TOTALS

	TOTAL HOUSING UNIT GROWTH	TOTAL EMPLOYMENT GROWTH
Projected	110,663	197,868
Allocated	115,763	204,927
Target	4.61%	3.57%

Step 5: Growth Aggregated to TAZs

Once growth for all jurisdictions was allocated for each time horizon, the parcel-based geographies were aggregated to TAZs using ArcGIS. **Figures C21** and **C22** illustrate the forecasted housing and employment growth, respectively.

Legend
- 2041-2050 Growth
- 2031-2040 Growth
- 2021-2030 Growth
- 2016-2020 Growth
- 2016 Housing Units

Legend

- 2041-2050 Growth
- 2031-2040 Growth
- 2021-2030 Growth
- 2016-2020 Growth
- 2016 Housing Units

0   2.5   5   10 Miles
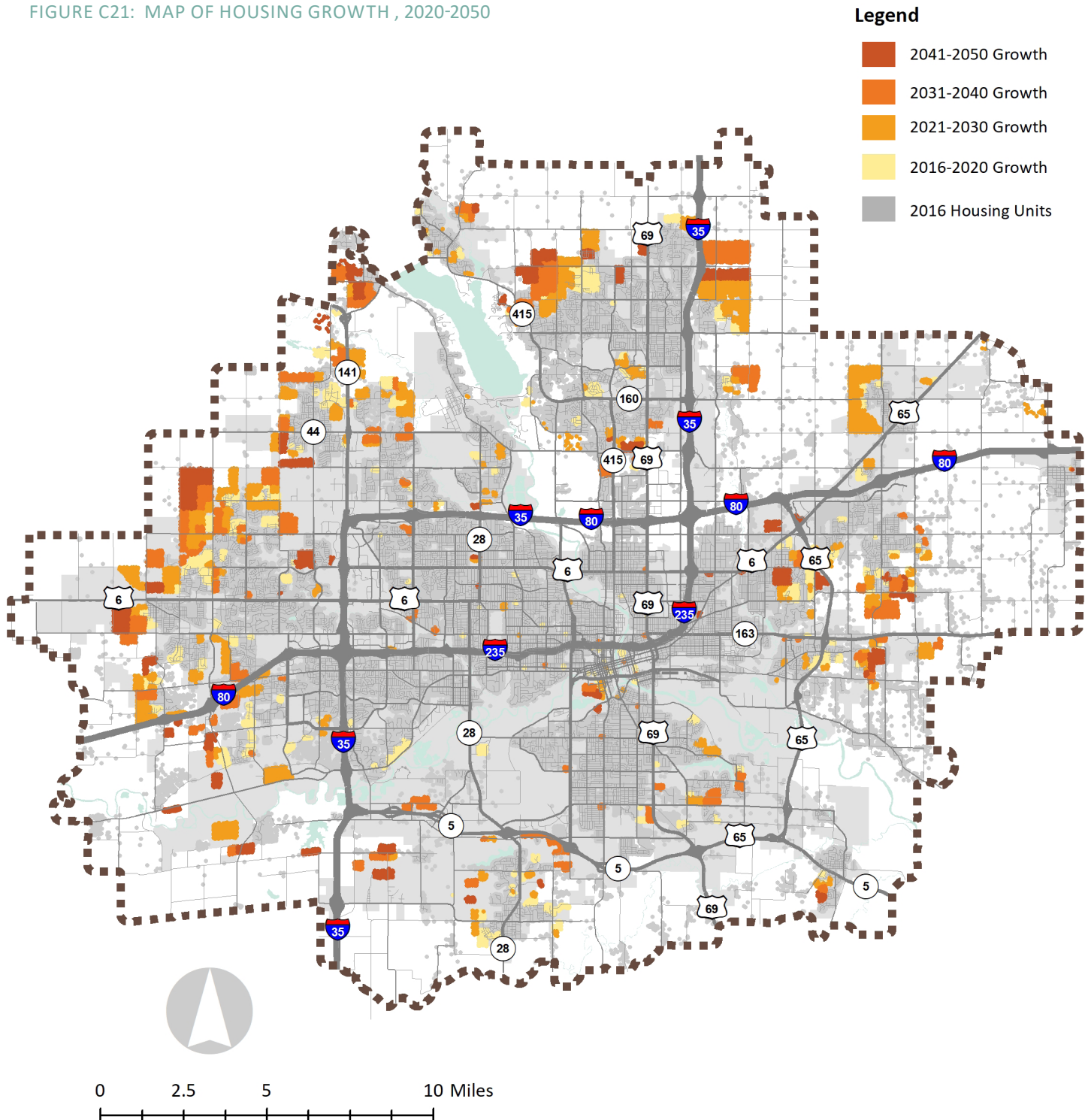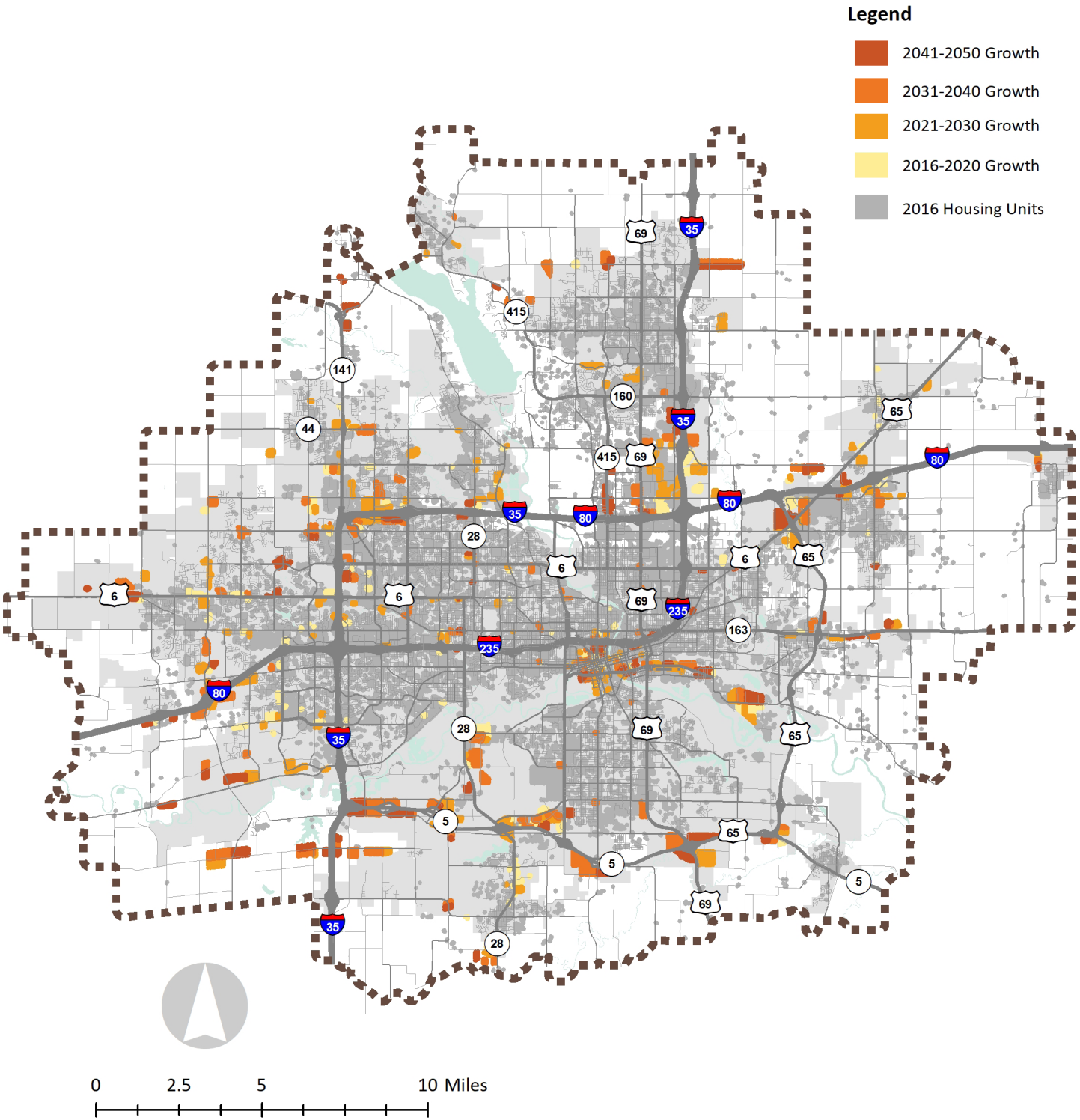
Population Forecasts

Staff also developed population forecasts. These forecasts were used for illustrative purposes when discussing the growth scenario with the Long-Rage Plan Steering Committee. The population numbers were derived using household size and vacancy rates from the 2010 U.S. Census. These rates were applied to the number of housing units from the 2016 base parcel file to determine the 2016 population for each jurisdiction listed in **Figure C23**.

FIGURE C23 BASE POPULATION CALCULATIONS

JURISDICTION	HOUSEHOLD SIZE	VACANCY RATE	2016 POPULATION
Altoona	2.64	4%	18,294
Ankeny	2.58	5%	62,579
Bondurant	2.83	4%	5,660
Carlisle	2.57	3%	4,198
Clive	2.68	5%	17,867
Des Moines	2.43	8%	211,799
Grimes	2.65	5%	12,935
Johnston	2.67	4%	21,448
Mitchellville	2.53	6%	1,823
Norwalk	2.7	5%	11,385
Pleasant Hill	2.57	5%	9,691
Polk City	2.73	3%	4,689
Urbandale	2.52	4%	42,546
Waukee	2.67	4%	20,811
West Des Moines	2.32	7%	62,515
Windsor Heights	2.24	5%	4,941
Dallas County	2.58	7%	3,916
Polk County	2.58	7%	22,782
Warren County	2.58	7%	3,340
Total			**543,219**

Source: US Census Bureau American Community Survey, 2013-2017 5-year Estimates

The same calculations were applied to the allocated housing units from **Figure C19** to determine population growth for each time period of the plan and total growth for each jurisdiction shown in **Figure C24.** The 2016 population from **Figure C23** was added to the total growth to determine the total population in 2050 shown in **Figure C25.**

FIGURE C24 POPULAITON PROJECTIONS - GROWTH BY TIME PERIOD

	2020	2030	2040	2050	TOTAL GROWTH BY JURISDICTION	TOTAL POPULATION 2050
Altoona	2,659	4,180	4,719	2,366	13,924	32,218
Ankeny	10,060	23,213	14,929	7,907	56,109	118,688
Bondurant	1,220	11,357	-	-	12,577	18,237
Carlisle	169	442	428	440	1,479	5,677
Clive	1,520	3,624	3,129	-	8,272	26,139
Des Moines	6,576	7,443	11,160	5,268	30,447	242,246
Grimes	1,642	3,825	2,629	1,892	9,988	22,923
Johnston	2,896	10,430	8,171	3,279	24,776	46,223
Mitchellville	5	14	14	10	43	1,866
Norwalk	4,168	2,450	1,273	579	8,470	19,855
Pleasant Hill	1,581	3,705	2,646	1,425	9,358	19,048
Polk City	493	1,126	1,078	525	3,221	7,910
Urbandale	4,345	9,024	9,157	7,143	29,669	72,214
Waukee	5,048	11,893	5,102	4,747	26,791	47,601
West Des Moines	4,857	11,933	11,296	9,493	37,579	100,094
Windsor Heights	148	-	-	-	148	5,089
Dallas County	-	-	-	-	-	3,916
Polk County	799	2,037	2,051	2,030	6,917	29,699
Warren County	-	-	-	-	-	3,340

	2016 BASE YEAR	2020	2030	2040	2050
Altoona	18,294	20,953	25,133	29,852	32,218
Ankeny	62,579	72,639	95,853	110,781	118,688
Bondurant	5,660	6,879	18,237	18,237	18,237
Carlisle	4,198	4,367	4,810	5,237	5,677
Clive	17,867	19,387	23,011	26,139	26,139
Des Moines	211,799	218,375	225,818	236,978	242,246
Grimes	12,935	14,577	18,402	21,030	22,923
Johnston	21,448	24,344	34,774	42,945	46,223
Mitchellville	1,823	1,828	1,842	1,856	1,866
Norwalk	11,385	15,552	18,002	19,276	19,855
Pleasant Hill	9,691	11,272	14,977	17,623	19,048
Polk City	4,689	5,182	6,308	7,386	7,910
Urbandale	42,546	46,891	55,915	65,071	72,214
Waukee	20,811	25,859	37,752	42,855	47,601
West Des Moines	62,515	67,372	79,305	90,601	100,094
Windsor Heights	4,941	5,089	5,089	5,089	5,089
Dallas County	3,916	3,916	3,916	3,916	3,916
Polk County	22,782	23,581	25,618	27,670	29,699
Warren County	3,340	3,340	3,340	3,340	3,340
TOTAL	**543,219**	**591,406**	**698,102**	**775,884**	**822,987**