



SAN JUAN COUNTY DEPARTMENT OF COMMUNITY DEVELOPMENT

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MEMO

REPORT DATE: July 5, 2018

TO: San Juan County Council
San Juan County Planning Commission

CC: Mike Thomas, County Manager

FROM: Adam Zack, Planner II *AZ*
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Erika Shook, AICP, Director DCD *ES*

SUBJECT: 2036 Comprehensive Plan Update: Housing Forecast

JOINT MEETING: July 20, 2018

ATTACHMENTS: Attachment 1 Method One: Forecast and Data
Attachment 2 Method Two: Forecast and Data
Attachment 3 Comparison of Methods One and Two

Purpose: Staff will brief the Council and Planning Commission on two possible approaches for determining a housing unit forecast and requests feedback after the briefing.

Background: A draft *Housing Needs Assessment* was issued in August 2017. Planning Commission and County Council were briefed on a second draft in October 2017. At that time, staff was requested to refine the housing unit forecast analysis for 2036. Specifically, staff was requested to determine how many housing units would be needed to house the permanent population and how many are expected to be constructed for seasonal use.

Due to the County's popularity as a vacation destination, more than forty percent of housing units in 2015 were used for seasonal, recreational and second homes and are not occupied year round by permanent residents. This makes forecasting future housing units in San Juan County challenging because population growth is not the only driver of housing construction. Housing construction is also driven by economic prosperity in the region that allows people to afford a second or vacation home in the San Juan Islands.

Once the housing unit forecast method is selected and the Land Capacity Analysis (LCA) is further underway, the LCA will be compared with the population projection and housing unit forecast to determine whether enough capacity exists to accommodate the projected levels of growth.

This memo is intended to prepare you for the briefing and it:

- Identifies 2016 and 2036 population, household, and housing unit numbers;
- Provides background on the data sets used;
- Discusses two methods of forecasting the number of housing units expected in the year 2036;
- Analyzes occupancy and vacancy rates;
- Discusses the relationship between the forecasts and the Land Capacity Analysis; and
- Provides a staff recommendation on the selection of a housing unit forecast (Method Two).

2016 and 2036 Population and Household Numbers:

Table 1 below depicts the 2016 and 2036 population, household and housing unit numbers. The 2036 population projection to be used in the Comprehensive Plan update was approved by County Council in Resolution No. 27-2017. The 2016 housing unit number comes from Washington State Office of Financial Management (OFM) data. This information provides a starting point for the following analysis.

Table 1. 2016 and 2036 population and projected households.

	2016 Population	2016 Households	2016 Housing Units	2036 Projected Population	2036 Projected Households
	16,314	7,997	13,859	19,423	9,521
Source	SJC Population Forecast	2016 population / 2.04 - SJC average household size	OFM postcensal housing units estimate	SJC Population Forecast	2036 population / 2.04 - SJC average household size

Source: Draft SJC Housing Needs Assessment and Resolution No. 27-2017.

Housing Unit Forecast Data Sets:

Four data sets were considered in the possible housing unit forecasts:

- Population forecast for the SJC Comprehensive Plan update (adopted by Resolution No. 27-2017);
- Washington State Office of Financial Management (OFM) postcensal housing unit estimates (1990 - 2016);
- Washington State Employment Security Department (ESD) housing permit data that is obtained from the US Census (1980-2016); and
- San Juan County permit data (2004 – 2017).

Staff analyzed this data to:

- Forecast the total number of housing units expected in the County in the year 2036, and
- Understand occupancy and vacancy rates and their relationship to permanent and seasonal population.

I. Forecasting the Number of Housing Units Expected by the year 2036.

Staff reviewed two methods of calculating the number of housing units expected by 2036.

Method One: Total Housing Unit Forecast using Office of Financial Management (OFM) Data

The Method One OFM data table and forecast graph are found on Attachment 1. The OFM postcensal housing unit estimate data from 1990 to 2016 was used to provide a housing unit trend projected through the year 2036. This type of forecasting considers one variable, the total housing unit count from OFM. It does not include other factors that influence the total number of housing units such as cost of development or demand for housing.

The Method One forecast is based on an exponential smoothing algorithm. It assigns a higher weight to the most recent observations, instead of using a simple average of variables over time. The equation for the forecast is $y = a + bx$, where:

$$a = \bar{y} - b\bar{x} \quad \text{And} \quad b = \frac{\sum (x - \bar{x})(y - \bar{y})}{\sum (x - \bar{x})^2}$$

The X bar and Y bar (X's and Y's with a line above them) represent the sample means, the average of known X's and Y's. In this forecast, the X (independent) variable is the year and the Y (dependent) variable is the number of housing units.

Method One Confidence Interval

The Method One forecast is based on a ninety-five percent confidence interval. This interval generates the upper and lower bounds of the housing unit projection. The 2036 forecast reflects the most probable outcome between the upper and lower bounds of the projection. These bounds reflect a range in the total number of housing units expected for a particular year. This range is within a 95 percent statistical likelihood.

Table 2 summarizes the Method One results. This forecast suggests that 20,531 total housing units would be expected in the County by the year 2036. This means that 333 units per year (6,672 total) would be added to the County's housing stock.

Table 2. Method One: 2036 Forecasts using OFM data from 1990 - 2016.

	2036 Housing Units	Units Added Per Year (2016-2036)	2036 Occupancy Rate	2036 Vacancy Rate
FORECAST	20,531	333	46%	54%
FORMULA	Method One forecast	2036 housing units – 2016 housing units / 20 years	2036 households / 2036 forecasted housing units	100% of housing units - 2036 Occupancy Rate

Source: Office of Financial Management data 1990 - 2016 data and staff calculations.

Method Two: Total Housing Unit Forecast Using Annual Building Permit Average from ESD

For Method Two, staff developed a linear forecast of expected housing units using Employment Security Department (ESD) building permit data from the U.S. Census Bureau. This data is found on Attachment 2.

Method 2 is a linear forecast starting with an average of the total number of building permits from 1980 through 2016. The annual average number of building permits issued over this period was 209 housing units. This number of units was added to the 2016 housing unit total and each year through 2036 to arrive at the forecast of 18,059 units by the year 2036. Using this linear forecast method, Table 3 shows a forecast of 4,180 housing new units by 2036.

Table 3. Method Two: 2036 Forecasts using ESD 1980 -2016 data.

Method Two	Units Added Per Year	2036 Housing Units	2036 Occupancy Rate	2036 Vacancy Rate
FORECAST	209	18,059	52.7%	47.3%
FORMULA	Average number of building permits 1980-2016	Method Two forecast	2036 households / 2036 forecasted housing units	100% - 2036 forecasted Occupancy Rate

Source: Employment Security Department data 1980 – 2016 and Staff calculations.

Analysis of Methods One and Two

The Method One housing unit forecast based on the OFM housing unit counts estimates the addition of 333 housing units per year. This results in a higher housing unit total than what would be expected based on the ESD estimate of the addition of 209 housing units per year. Method One estimates that there will be 124 more units per year than Method Two.

The OFM data used in Method One show significant increases in the housing stock every ten years, coinciding with the decennial U.S. Census. This pattern suggests that some un-permitted housing units may have been counted. Method One shows inflated rates of growth compared to County permit data and ESD rates.

The rate of housing unit growth in Method Two is more in line with reasonable expectations based on the annual number of building permits the Department of Community Development (DCD) issues. The DCD records between 2004 and 2017 are similar to the ESD data for the number of housing units. This DCD data is shown on Attachment 3.

The type of statistical analysis used in Method One cannot be reliably used with historic building permit data because of variations in the permit data that fluctuate during times of growth and stagnation. Using Method Two which considers the average of the building permit data is more likely to reflect future rises and dips in the housing construction.

II. Housing Unit Occupancy and Vacancy Rates.

To better understand the implications of the two housing unit forecasts, the estimated occupancy and vacancy rates for 2036 should be considered. These rates were calculated by comparing the total number of forecasted housing units with the expected population (Tables 1, 2, and 3).

The County expects to have a population of 19,421 by the year 2036. At a rate of 2.04 people per household, this translates to 9,521 households. If each of these households occupies a housing unit, 9,521 housing units will be occupied regardless of which forecast method is selected.

To understand why there is such a high percentage of existing vacant housing units, the 2015 U.S. Census American Community Survey (ACS) data was considered. It is a five year estimate of housing unit data from 2010 - 2015. In 2015, eighty-one percent of vacant housing was used for seasonal, recreational, or occasional uses. This large percentage indicates that vacation rentals and second homes generally house the County's seasonal population.

Method One forecasts 20,531 housing units and an occupancy rate of forty-six percent by 2036 (see Table 2).

At this rate, Method One suggests that the County would have 11,010 vacant housing units by 2036. Method Two forecasts 18,059 housing units total and an occupancy rate of fifty-two percent (see Table 3). Method Two suggests that the County would have 8,538 vacant units by 2036.

Table 4. Methods One and Two occupancy and vacancy rates.

Method	Occupancy Rate	Vacancy Rate
One	46%	54%
Two	52.7%	47.3%

Source: Tables 2, and 3 and staff calculations.

Based on the ACS data, the vacancy rate in 2015 was forty-three percent. The use of Method One results in a vacancy rate of fifty-four percent. This is a significant eleven-percentage point increase in the vacancy rate from 2015 to 2036. The forty-seven percent vacancy rate determined using Method Two indicates a more modest, four-percentage point increase in vacancy rate over 2015 levels. The use of Method Two and its resulting vacancy rate is more consistent with the 2015 ACS estimate of forty-three percent.

Occupancy and vacancy rates associated with the housing unit forecasts will be used to help guide housing and land use policy development. Occupancy rates indicate the number of units available for permanent residents and vacancy rates are typically used for seasonal occupation. The selection of a forecast method will influence planning for population growth because the Comprehensive Plan should account for housing both seasonal and permanent populations.

III. Relationship to the Land Capacity Analysis.

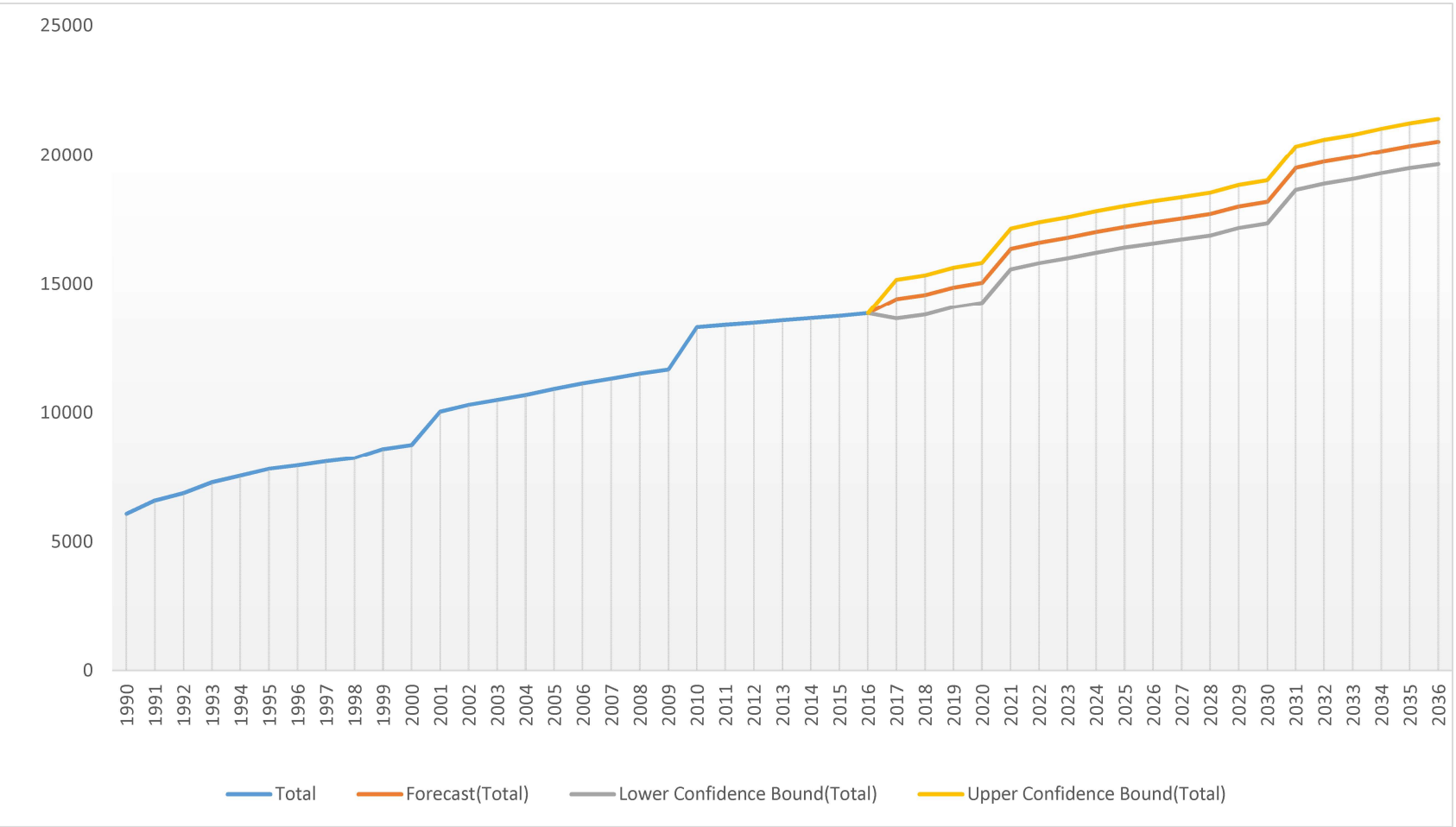
Later in the Comprehensive Plan update process, comparison of the forecasted housing units and occupancy rate to the dwelling unit capacity from the *Land Capacity Analysis* (LCA) will influence the update of goals and policies. The LCA will provide a dwelling unit capacity that shows, under current regulations, how many new dwelling units could be built in the County. This capacity will be compared with the population projection and housing unit forecast to determine whether enough capacity exists to accommodate the projected levels of growth. If there are any discrepancies between dwelling unit capacity and the projected growth in population and housing units, changes to the goals and policies may be needed to address topics such as density and the size of urban growth areas.

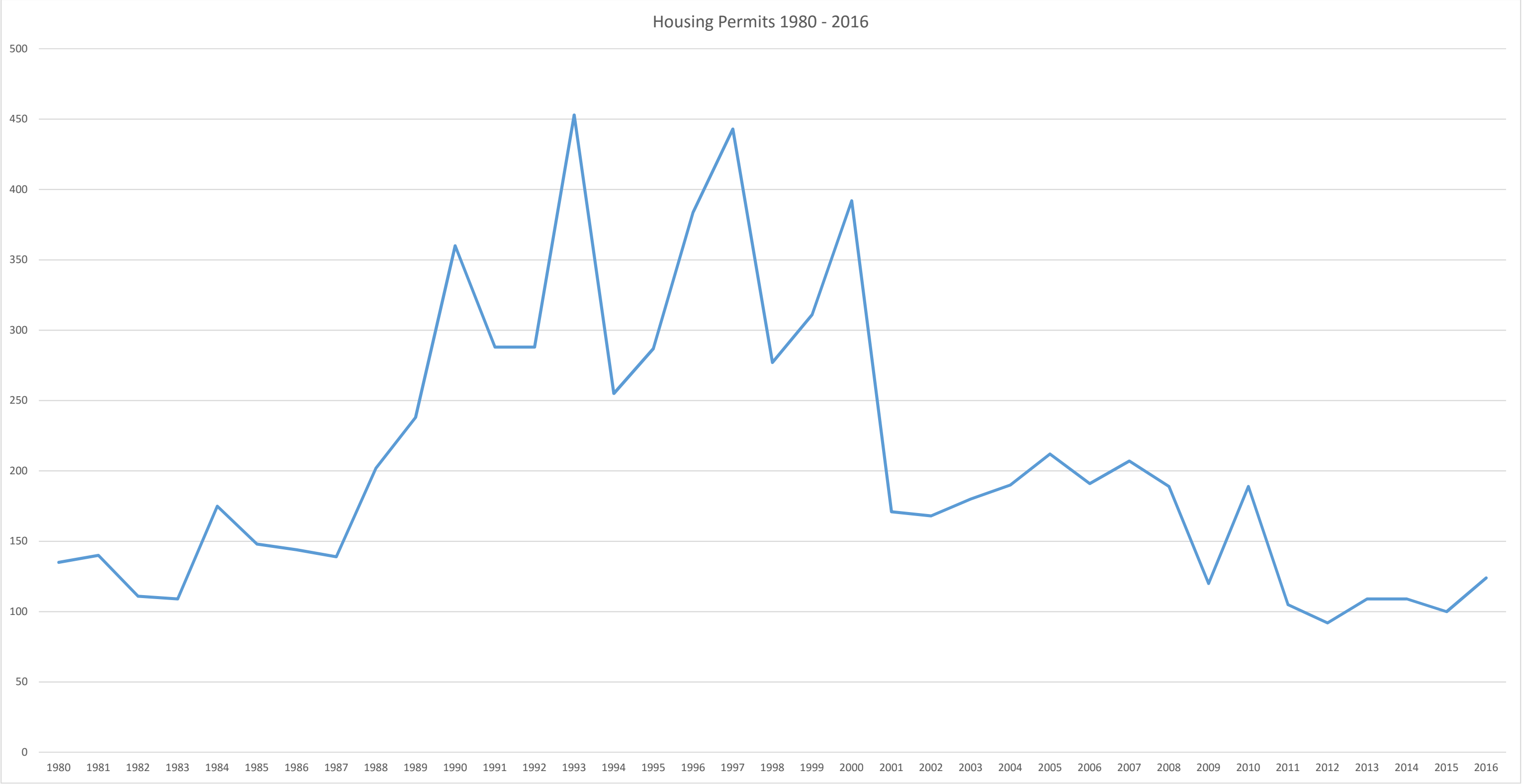
IV. Staff Recommendation.

Staff recommends that Method Two be used to determine the forecasted housing unit total for the *Housing Needs Assessment*. It is more consistent with development trends because it is based on ESD building permit data from 1980 to 2016.

Method Two captures a broader picture of development and accounts for periods of higher and lower levels of development than Method One. It represents an average of the number of building permits issued over time. Method One may produce an inflated number because of the anomalous rise centered on each decennial Census year, resulting in an exaggeration in the forecast model.

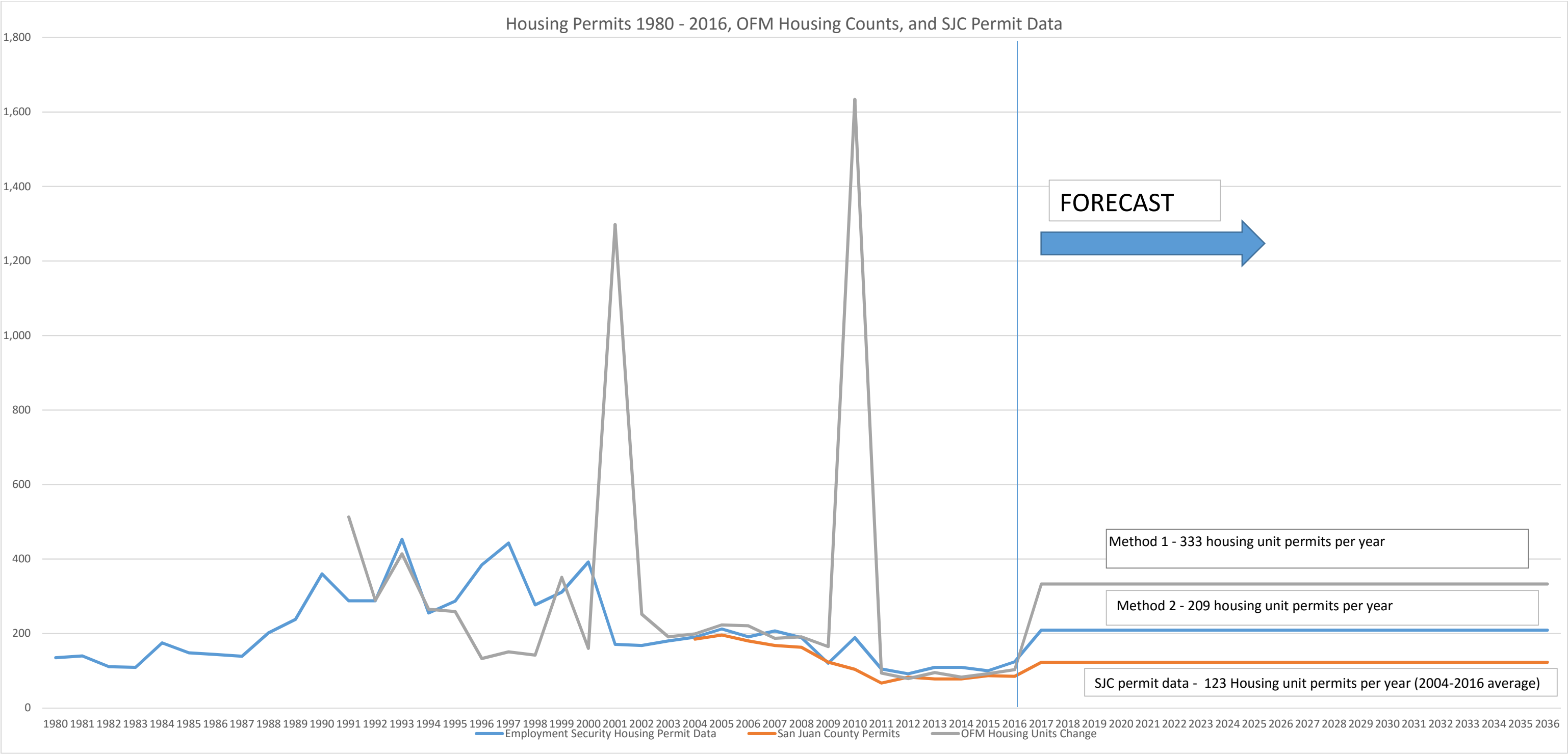
year	Total	Forecast(Total)	Lower Confidence Bound(Total)	Upper Confidence Bound(Total)
1990	6075			
1991	6588			
1992	6877			
1993	7291			
1994	7556			
1995	7815			
1996	7948			
1997	8099			
1998	8241			
1999	8592			
2000	8752			
2001	10050			
2002	10302			
2003	10493			
2004	10692			
2005	10915			
2006	11136			
2007	11323			
2008	11514			
2009	11679			
2010	13313			
2011	13407			
2012	13486			
2013	13581			
2014	13664			
2015	13756			
2016	13859	13859	13859.00	13859.00
2017		14409.24549	13651.79	15166.70
2018		14572.53148	13808.99	15336.07
2019		14867.58858	14097.92	15637.26
2020		15046.27707	14270.43	15822.12
2021		16360.79293	15578.72	17142.86
2022		16606.6438	15818.30	17394.98
2023		16791.75883	15997.10	17586.41
2024		17020.08873	16219.07	17821.10
2025		17221.08562	16413.67	18028.51
2026		17388.1603	16574.29	18202.03
2027		17551.99792	16731.54	18372.46
2028		17715.28392	16888.29	18542.28
2029		18010.34102	17176.77	18843.92
2030		18189.02951	17348.83	19029.23
2031		19503.54537	18656.68	20350.41
2032		19749.39624	18895.82	20602.97
2033		19934.51127	19074.19	20794.83
2034		20162.84117	19295.73	21029.95
2035		20363.83806	19489.89	21237.78
2036		20530.91274	19650.09	21411.73





Housing Permits																				
year	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Total Units	135	140	111	109	175	148	144	139	202	238	360	288	288	453	255	287	384	443	277	311
Single-Family Units	123	140	99	101	120	148	127	127	190	217	299	271	263	406	208	261	332	425	275	311
Multi-Family Units	12	0	12	8	55	0	17	12	12	21	61	17	25	47	47	26	52	18	2	0
Units in 2-unit Multi-Family Structures	2	0	0	0	0	0	14	0	0	6	20	4	0	0	0	0	0	0	2	0
Units in 3- and 4-unit Multi-Family Structures	0	0	0	8	0	0	3	4	6	6	0	0	0	0	0	0	0	0	0	0
Units in 5+ Unit Multi-Family Structures	10	0	12	0	55	0	0	8	6	9	41	13	25	47	47	26	52	18	0	0

2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
392	171	168	180	190	212	191	207	189	120	189	105	92	109	109	100	124
368	171	161	178	172	204	189	157	184	120	189	105	92	109	109	100	118
24	0	7	2	18	8	2	50	5	0	0	0	0	0	0	0	6
24	0	4	2	12	4	2	16	0	0	0	0	0	0	0	0	6
0	0	3	0	6	4	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	34	5	0	0	0	0	0	0	0	0



Attachment 3

Comparison of Methods One, Two and SJC Permit Data

year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
Population																		
Households																		
Housing Units (OFM)	6075	6588	6877	7291	7556	7815	7948	8099	8241	8592	8752	10050	10302	10493	10692	10915	11136	11323
Unit Forecast (based on OFM housing unit total) Method One																		
Unit Forecast (based on building permit average) Method Two																		
Projected Population																		
Projected Households																		
Building Permits (From ESD)	360	288	288	453	255	287	384	443	277	311	392	171	168	180	190	212	191	207
San Juan County Permit Data															185	196	180	168

2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
								16314														
								7997.059														
11514	11679	13313	13407	13486	13581	13664	13756	13859														
									14409.25	14572.53	14867.59	15046.28	16360.79	16606.64	16791.76	17020.09	17221.09	17388.16	17552	17715.28	18010.34	18189.03
									14088	14297	14506	14715	14924	15133	15342	15551	15760	15969	16178	16387	16596	16805
									16469.45	16624.9	16780.35	16935.8	17091.25	17246.7	17402.15	17557.6	17713.05	17868.5	18023.95	18179.4	18334.85	18490.3
									8073.26	8149.461	8225.662	8301.863	8378.064	8454.265	8530.466	8606.667	8682.868	8759.069	8835.27	8911.471	8987.672	9063.873
189	120	189	105	92	109	109	100	124														
163	123	104	67	83	78	78	87	85	123													

2031	2032	2033	2034	2035	2036
19503.55	19749.4	19934.51	20162.84	20363.84	20530.91
17014	17223	17432	17641	17850	18059
18645.75	18801.2	18956.65	19112.1	19267.55	19,423
9140.074	9216.275	9292.475	9368.676	9444.877	9521.078