

APPENDICES BUILDINGS BASELINE STUDY

TABLE OF CONTENTS

Appendices Buildings Baseline Study 1

Appendix A: Building Age Distribution..... 2

Appendix B: Residential EUI Versus Solar and EV Adoption 3

Appendix C: Electricity Consumption Disaggregation..... 5

Appendix D: Natural Gas Consumption Disaggregation 6

Appendix F: Residential Square Footage by Decade Built7

Appendix G: Single-Family and Condo Units by Decade Built..... 8

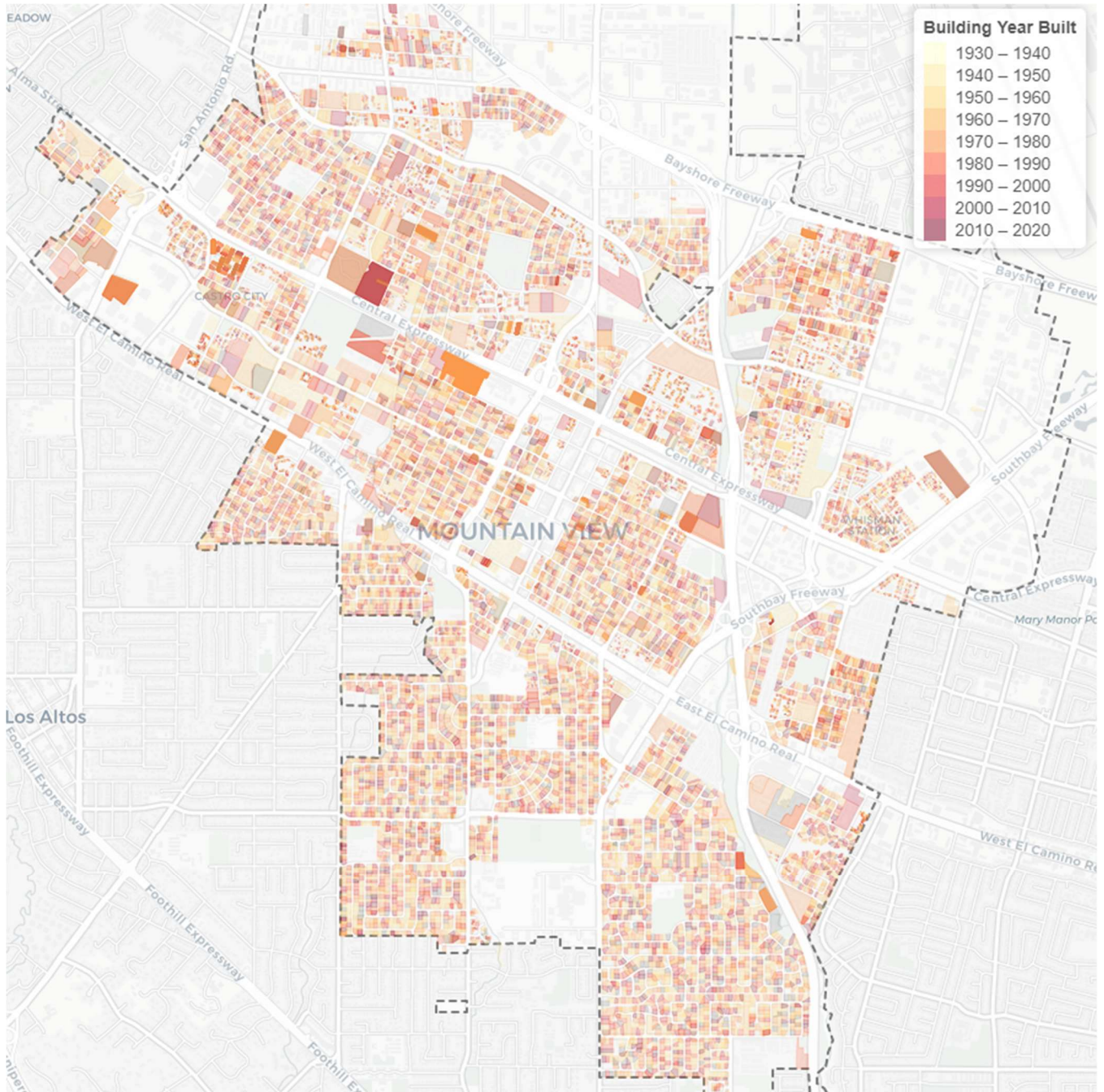
Appendix H: Multi-Family Units and Parcels Built by Decade 9

Appendix I: Building Size Versus Electricity Consumption 10

Appendix J: Building Size Versus Natural Gas Consumption 11

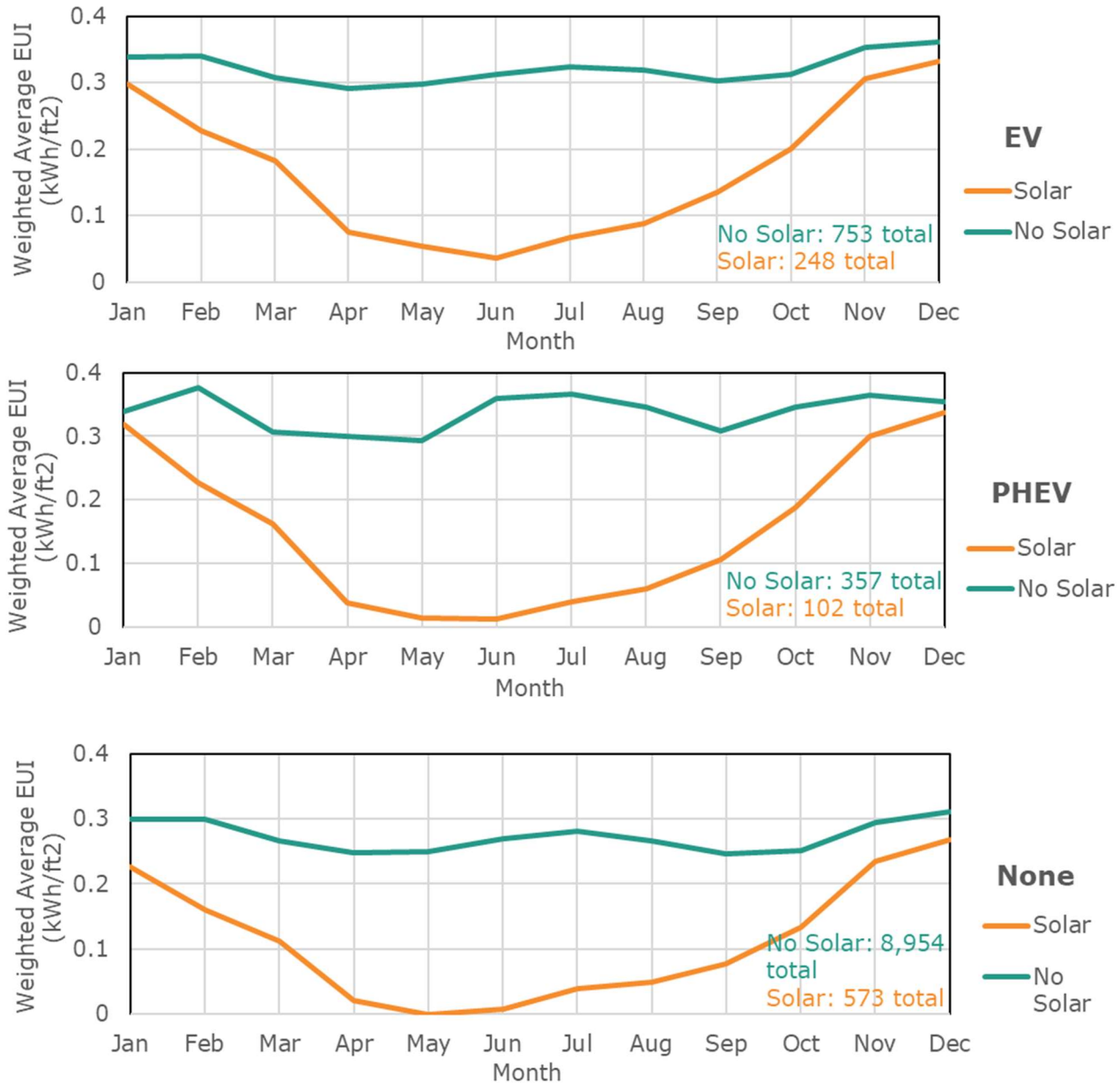
Appendix A: Building Age Distribution

The figure below shows the construction year range of buildings in Mountain View.



Appendix B: Residential EUI Versus Solar and EV Adoption

The electricity EUI was calculated for each month for single-family homes and townhomes for the Mountain View electricity accounts that were successfully matched to a parcel.¹ The resulting electricity EUI, as a function of existence of solar and vehicle type registered at the address, is shown in the figures below.²



As shown in the figures above, solar customers have a very different monthly electricity EUI profile compared to non-solar customers. This has implications for seasonal trends in net electricity consumption as a function of solar PV adoption. As previously described, residential electricity consumption is approximately 25% lower in the summer months. Rooftop solar PV adoption in the

¹ Condos were not plotted in this figure due to there being only a few condos that were matched to an account with solar.

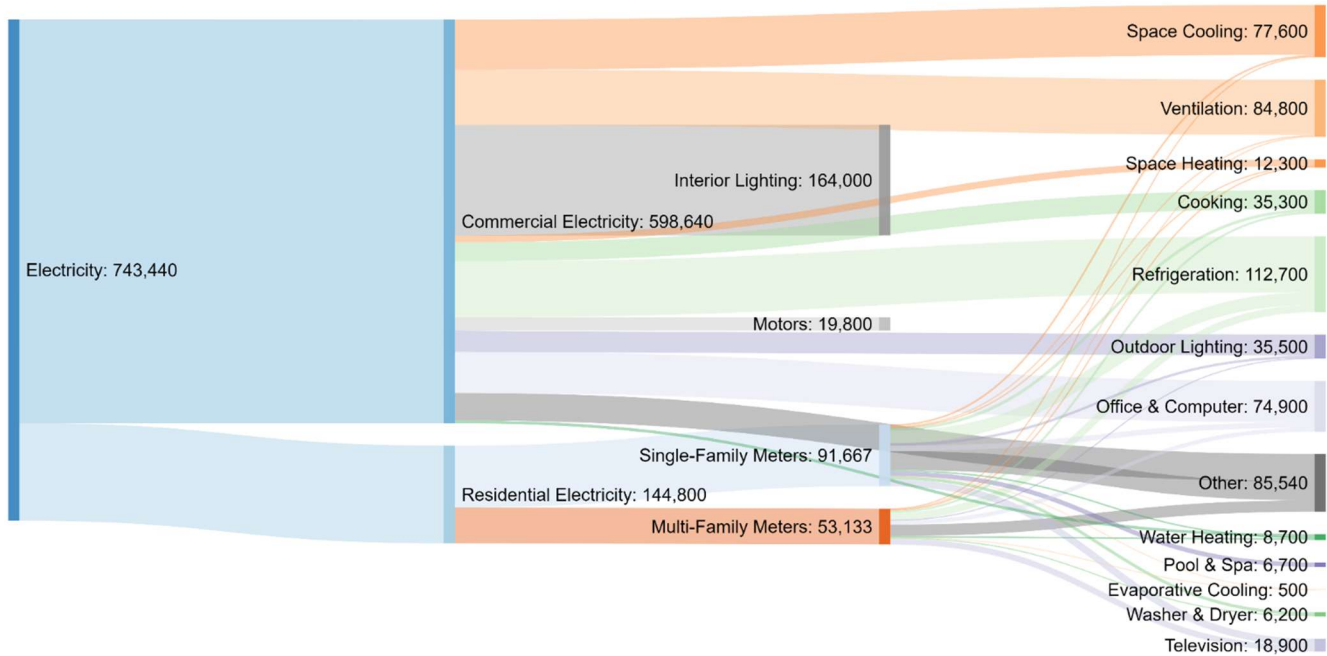
² The combined EUI of multiple buildings is calculated using the weighted average (by square footage) of the EUIs of each building.

residential sector may have influenced this trend—the figure above shows that solar residential customers have the lowest electricity EUI in the summer months, while non-solar residential customers have increased electricity EUIs in the summer months.

Non-solar customers with an electric vehicle tend to have an annual electricity EUI that is approximately **18% to 24% higher** than non-solar customers with no electric vehicle. Solar customers with an electric vehicle tend to have an annual electricity EUI that is approximately **36% to 51% higher** than solar customers with no electric vehicle. These trends give a sense of the increased electricity demand due to home EV charging.

Appendix C: Electricity Consumption Disaggregation

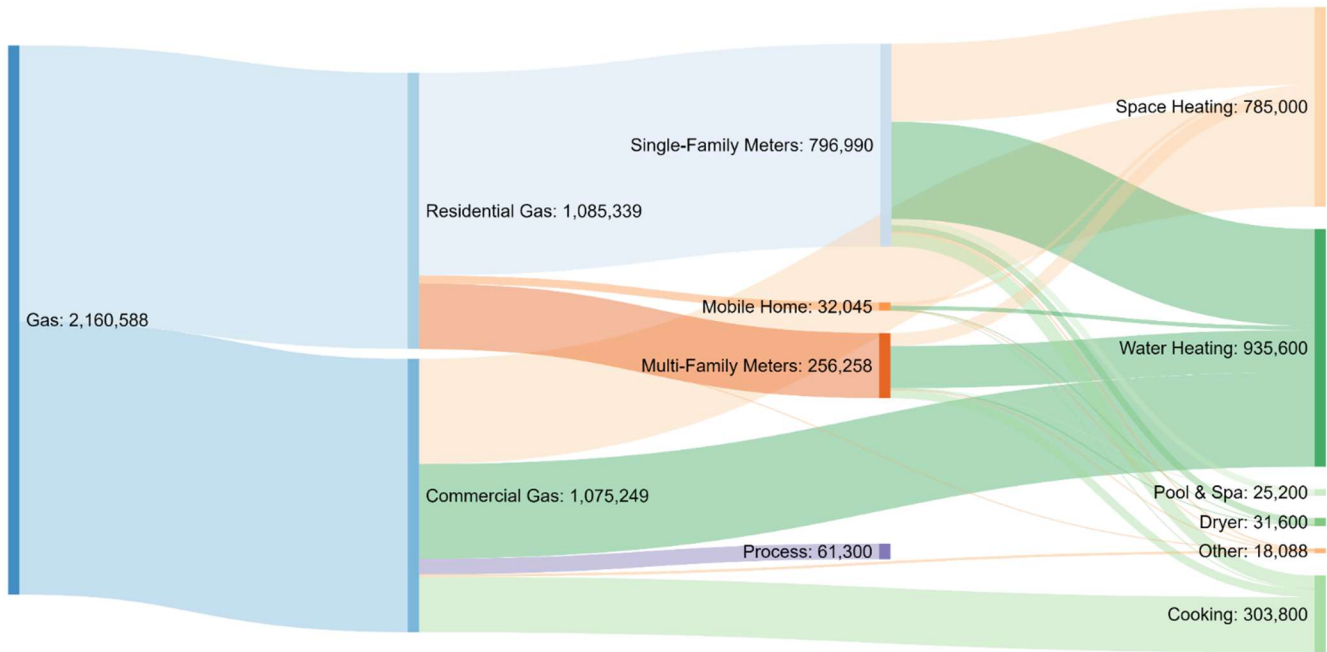
The figure below shows end-use consumption patterns of electricity (MWh) in Mountain View in 2018.³ In the following figure, single-family meters consist of single-family homes and townhomes; multi-family meters consist of condos and multi-unit dwellings.



³ Approximately 30% of residential electricity load is not categorized. It is also important to note that the residential (RASS, 2009) and commercial (CEUS, 2006) end-use surveys that the figures are based on predate the widespread adoption of LED lighting. The updated RASS and CEUS surveys are expected to be completed in March 2020 and March 2021, respectively—therefore, there will likely be significant changes in end-use fractions after the next survey update.

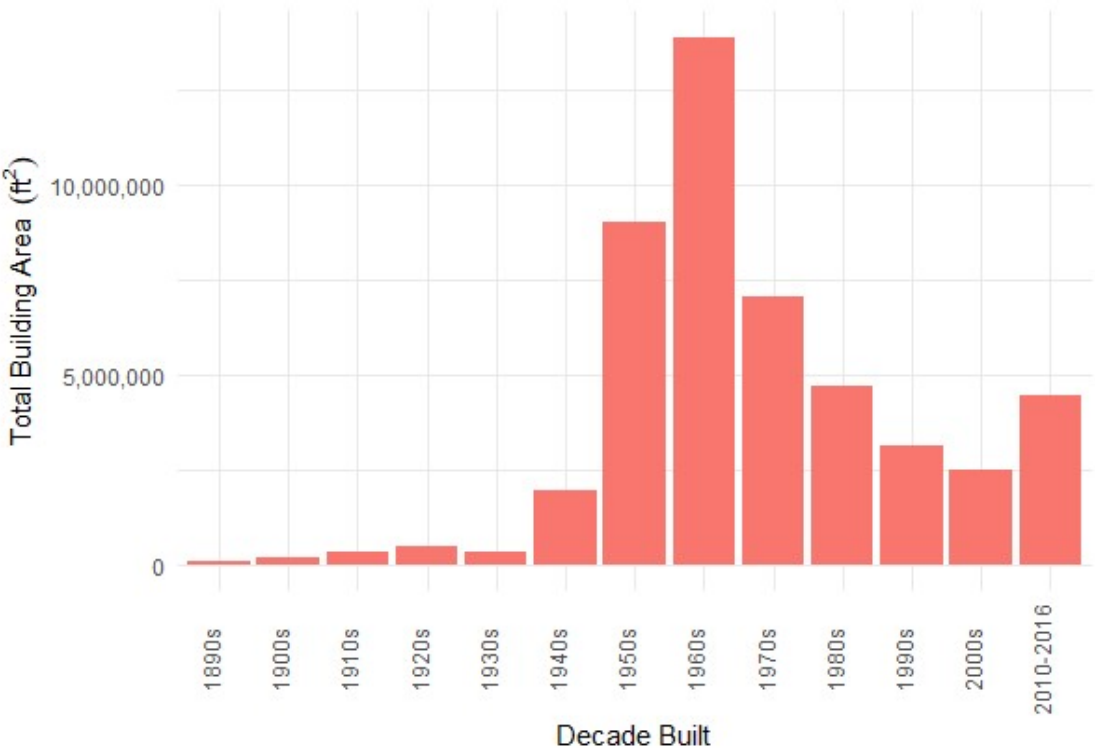
Appendix D: Natural Gas Consumption Disaggregation

The figure below shows end-use consumption patterns of natural gas (MMBtu) in Mountain View in 2018. Water heating, space heating, and cooking make up approximately **94%** of all natural gas consumption. In the following figure, single-family meters consist of single-family homes, townhomes, and condos; multi-family meters consist of multi-unit dwellings.



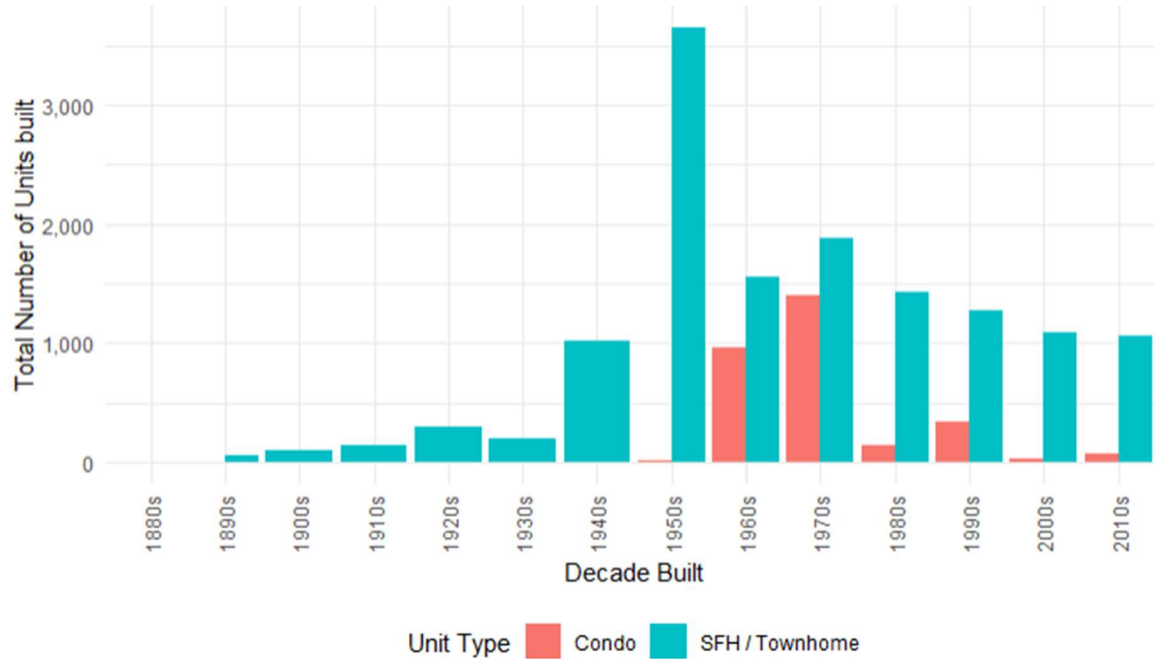
Appendix F: Residential Square Footage by Decade Built

The following figure shows the total residential square footage (both single and multi-family) in Mountain View by construction decade, after removing outliers. A large percentage of residential square footage was constructed in the 1960s.



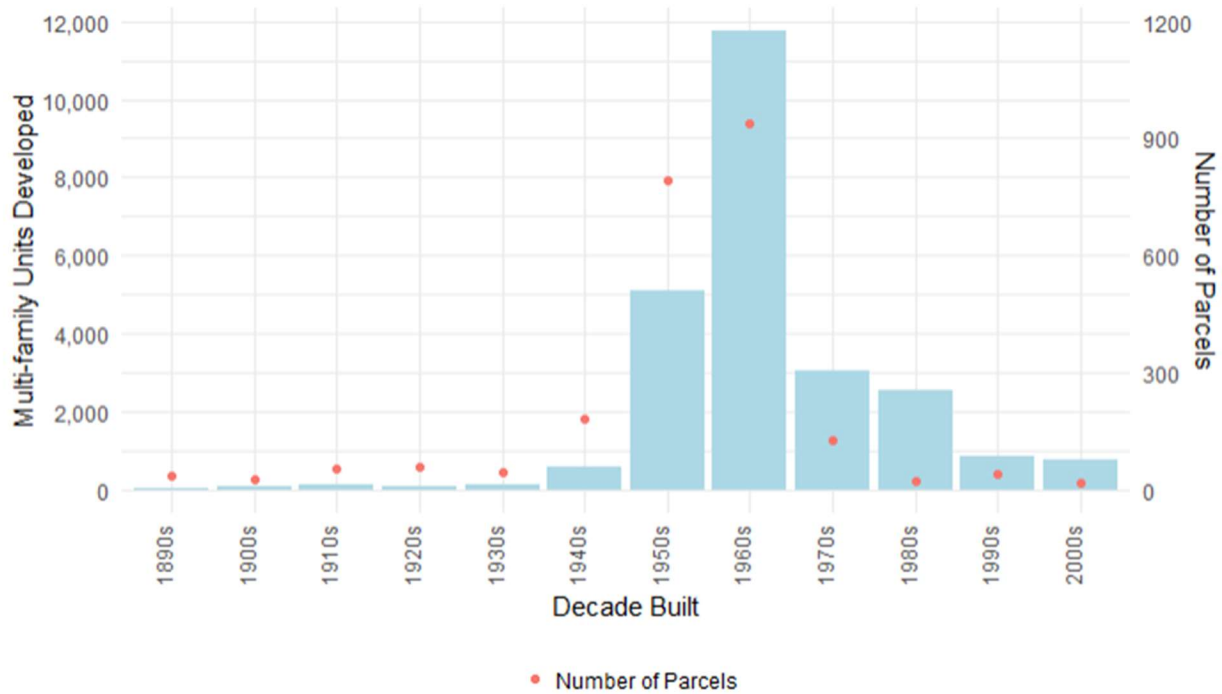
Appendix G: Single-Family and Condo Units by Decade Built

The following figure shows the total single-family home/townhome and condominium unit count in Mountain View by construction decade, after removing outliers. Most condos were built in the 1960s and 1970s.



Appendix H: Multi-Family Units and Parcels Built by Decade

The following figure shows the total number of multi-family (apartment) units in Mountain View built by decade, as well as the total number of *parcels* developed. This shows that new multi-family dwellings typically have more units than older multi-family dwellings. A large percentage of multi-family parcels and units were developed in the 1960s.



Appendix I: Building Size Versus Electricity Consumption

The figure below shows the relationship between building size and electricity consumption for condos and single-family homes/townhomes in Mountain View.⁴ On an annual basis, condo units typically have lower electricity consumption than single-family homes, possibly due to lower unit square footage and fewer inhabitants per unit compared to a single-family home.



⁴ For condos, building area refers to the area of each individual unit.

Appendix J: Building Size Versus Natural Gas Consumption

The figure below shows the relationship between building size and natural gas consumption for condos and single-family homes/townhomes in Mountain View.⁵ On an annual basis, condo units typically have lower natural gas consumption than single-family homes, possibly due to lower unit square footage and fewer inhabitants per unit compared to a single-family home.



⁵ For condos, building area refers to the area of each individual unit.

