Post Camp Fire Regional Population and Transportation Study

Appendix A

Pre and Post Camp Fire Conditions and Regional Growth Forecast

FEHR PEERS

Fehr & Peers Project # RS19-3800

Table of Contents

Post Camp Fire Regional Population and Transportation Study

Prepared for:
Butte County Association of Governments

Report of Pre and Post Camp Fire Conditions

Tasks 4.2 and 4.3

Print Date August 14, 2020

FEHR PEERS

Fehr & Peers Project # RS19-3800

Table of Contents

Appendices

Introduction

This Technical Report functions as a combined deliverable for Tasks 4.2. and 4.3. These two tasks focused on identifying the Camp Fire's impacts on travel patterns, economics, and demographics across Butte County. Multiple data sources were analyzed including:

- Traffic Counts
- Large Employer Commute Surveys
- Butte County Travel Survey
- Public Outreach
- Inventory of Land Use
- Cellular Device Travel Information

This memorandum begins with an overview of key findings from the various sources. Following that is a detailed breakdown by data source, highlighting the relevant analysis. At the end of the memorandum is an overview of disaster recovery activities in other jurisdictions.

An analysis of public transit services can be found in a separate Technical Memorandum titled ***Butte County Transit and Non-Motorized Plan Update -***

Overview of Key Findings

The Camp Fire (November 2018) was the single deadliest and most destructive wildfire in the history of the State of California. It not only destroyed most of the Town of Paradise, it also had ripple effects that extended to Chico, Oroville, the other small towns in the county, and even communities over the county line.

The restoration process involves the preparation of the Post Camp Fire Regional Population and Transportation Study. The first step is identifying the effects the fire had on transportation, economics, and demographics.

After collecting, reviewing, and analyzing the data from a variety of sources, we have determined that the following were key outcomes from the Camp Fire.

Vehicle Activity

- Overall traffic volume (including trucks) across all traffic count locations decreased by 3% post fire. The changes by jurisdiction are listed below.
    - Biggs increased by 10%
    - Chico increased by 11%
    - Gridley increased by 17%,
    - Oroville and Thermalito increased by 15%
    - Paradise and Magalia decreased by 43%
- Overall average daily passenger vehicle volumes (excluding trucks) decreased by 11%.
- Despite the overall reduction, there were several areas that experienced a significant increase in daily traffic volume including:

    Chico
    - East Ave east of Esplanade Rd, +5,076 (+21%)
    - Cohasset Rd south of East Ave, +4,082 (+19%)
    - Esplanade Rd south of East Ave, +3,777 (+18%)
    - East 1st Ave west of Sherman Ave, +3,693 (+21%)

    Oroville
    - 18th St north of Oro Dam Blvd (+29%)
    - Montgomery St west of Table Mtn Blvd (+13%)
    - Orange Ave west of Acacia Ave (+21%)

    Unincorporated County
    - Aguas Frias Rd south of Durham Dayton Rd (+68%)
    - Los Verjeles Rd south of La Porte Rd (+39%)
    - Lower Wyandotte Rd west of Alverda Dr (+44%)
- Not surprisingly, Paradise experienced a decline in traffic volume. There were several other locations that also show a decrease in volume. The largest decreases in total vehicle volume are shown occurring at:

Paradise

- Clark Rd north of Pearson Rd, (-49%)
- Skyway south of Pearson Rd, (-30%)
- Clark Rd north of Wagstaff Rd, (-54%)
- Pearson Rd east of Clark Rd, (-61%)
- Bille Rd east of Skyway, (-65%)

Chico

- Skyway south of Bruce Rd (-15%)
- W 3rd east of Ivy St (-12%)

Unincorporated County

- Skyway east of Cliffhanger Ln (-23%)

- Vehicular travel across the Butte County line (to and from) experienced a substantial increase (15% increase in both directions).
- There was a significant increase (206%) in medium-duty truck activity across all locations, especially in Paradise along Skyway.
- While overall average heavy-duty truck traffic dropped by over one-third (38%), some areas did see an uptick including:

  Chico

  - Skyway east of Bruce Rd, (+78%)
  - Cohasset Rd north of Eaton Rd, (+602%)

  Paradise

  - Wagstaff Rd west of Pentz Rd, (+387%)
  - Pentz Rd north of Pearson Rd (+179%)

  Unincorporated County

  - Skyway east of Cliffhanger Ln, (+254%)

- As for vehicle speeds:
  - Activity in the higher vehicle speed ranges (30-50 mph and 50 mph+) decreased by 7% and 26% respectively.[1]
  - Overall volumes in the 0-30 mph range increased by 10% across all locations.[2] The roadways experiencing the largest increases in this speed range include:
    - Cohasset Rd south of East Ave (+40%)
    - East 1st Ave west of Sherman Ave (+70%)
    - Park Ave north of East Park Ave (+65%)

[1] Travel volumes shifted from the higher speed limit roadways into the lower speed ranges within cities.

[2] Based on the increased volume on roadways within Chico and non-rural roads, the speed increase is mostly due to increased volume on roadways with speed limits of less than 30 mph. This can be verified by looking at the "before and after" speed changes at the locations. It appears that the change in volume did not cause a major change in observed speed.

Travel Patterns and Habits

Large Employer Commute Survey

Employees at 165 large employers completed a survey about their commute activities. We learned that:

- Over 50% of respondents run errands to/from work (trip chain), which can make switching to ridesharing and transit more difficult.
- Transit currently does not work for most people (e.g., inadequate hours and frequency and a lack of emergency guaranteed ride home).
- 90% of respondents do not work on the weekends.
- When asked what would incentivize individuals not to drive alone, the greatest responses were: 1) provide some type of financial incentive and/or 2) provide a guaranteed ride home for emergencies.

Butte County Travel Survey[3]

This survey was administered online and at pop-up events. Key findings include:

- Most respondents (66) were employed and drive alone to/from work
- As the number of vehicles in a household increases, the use of transit by people in that household tends to decrease

Public Outreach

Respondents at pop-up events in 2019[4] were asked what issues kept them from walking or bicycling more frequently. The most frequent responses include:

- Issues walking outside: 34% missing sidewalks, 30% unsafe crossing/intersection, 26% personal safety
- Issues biking: 37% no bike paths/lanes, 35% high car traffic speed/volume, 15% no place to park bike at destination

[3] For information about issues related to public transit services please refer to Butte County Transit and Non-Motorized Plan Update –

[4] According to AIM Consulting, a total of more than 80 people (combined) attended pop-up events on November 24 (Chico Christmas Preview, Chico, CA) and December 5 (Paradise Alliance Church Community Dinner, Paradise, CA).

Cellphone Data[5]

- Total weekday trip activity[6] decreased marginally (-6%) in the year following the Camp Fire.
- Total weekend trips experienced a more significant decrease (-18%) than weekday trips during the same period.
- Total weekday trips entering Butte County experienced a significant increase (+14%) over the same period while weekend trips decreased (-9%). Of the total weekday increase in trips into Butte County, Tehama accounted for 40%, Yuba accounted for 23%, and Sutter accounted for 18%.
- Total weekday trips leaving Butte County over the same period also experienced an increase of +10%. For the increase of trips, the major destinations to surrounding counties were Tehama (+43%), Yuba (24%), and Sutter (17%).
- Total weekend trips exiting the Butte County decreased substantially (-10%).
- Weekday trips that stayed within Butte County decreased by 9% between 2018 and 2019. Weekend trips declined by 25% over the same period.

Demographics, Businesses and Economics

Where did people relocate?

The main counties where Camp Fire survivors relocated include Sacramento, Placer, Sutter, and Yuba. For people who relocated within Butte County, the two main destinations were Chico and Oroville.

Home Values and Ownership

The data did not reveal any significant changes in home values following the fire.[7] Not surprisingly, there was a decrease in home ownership and an increase in renting.

[5] Anonymized cellphone data representing between 10% and 20% of the population obtained from telecommunications companies were collected, evaluated for travel patterns of residents, workers, and visitors, and aggregated to represent "before and after" conditions. When comparing travel patterns from 2017 to 2018 and 2018 to 2019, there is an increase in relocating from 14% to 17%, respectively.

[6] The definition of the cellphone trip is based on the location of the origin of the trip compared to the destination of the trip, regardless of trip purpose or location of residency. For example, a trip starting within Butte County and ending outside of Butte County is considered a trip leaving Butte County. When combining purpose (to work, to home) with direction, it is inferred the resident trip is for home purposes. For example, a trip starting outside of Butte County with a trip purpose of "to home" is inferred to be a resident of Butte County and is described as a trip entering Butte County to their home within Butte County.

[7] The InfoGroup data are based on the estimated value of the home at its last appraisal, not the asking or market value. The data are also only a sample for each year, and the overall data are only for residents who lived in Butte County before or after the fire, not the location they lived before the fire outside of Butte County. The InfoGroup data may have this result because of the data collection method being a sample, or it could be that those who relocated purchased houses in roughly the same price range because that is what they could afford. Those who could not afford or did not want to stay in Butte County are those that migrated out of the county.

Changes in Business

There were no significant changes in business types (based on percentage of businesses) following the fire with one exception: Health Care and Social Service-related businesses declined by a few percentage points. Businesses that had to relocate tended to go to Sutter County. New businesses that have started post fire have been mostly in Chico and Oroville.

Buildings (residential and commercial)

As expected, almost all residential and commercial reductions in Butte County occurred in Paradise as a direct result of the fire. Single-family structures within Paradise were reduced by 85%, multi-family structures were reduced by 71%, and mobile homes were reduced by 96%. Some reconstruction did begin in Paradise in 2019 including many temporary residential units (648).

Overall Impression

From a transportation perspective, most of Butte County can be considered low density and/or rural, and this characteristic has a direct impact on transportation and mobility. There are limited options for using public transit, except within the City of Chico, and in many areas, it is physically difficult to walk or bike between destinations due to limitations in the pedestrian and bicycle network such as lack of sidewalks, lack of complete bicycle lanes, etc. Historically, most people have had to drive to get from one place to another within the county.

The findings seem to support what one would expect following a major natural disaster that literally destroyed most of a town. Traffic levels were up in the primary surrounding community, traffic in the impacted community decreased, weekday activity between the impacted county and neighboring counties increased (contractors, supplies, people commuting to temporary housing and jobs, etc.). Cars were still the dominant mode of travel and will likely remain so without significant capital expenditures for increased transit service plus improvements to bicycle and pedestrian facilities.

Data Sources and Analysis

Traffic Counts and Travel Patterns

Traffic Counts

Traffic counts at 343 locations were collected during the middle of the week (Tuesday-Thursday) between September-November 2017, September-October 2018, and November 2019. Among these locations, 54 were identified where count data was collected both before and after the fire. These counts were summarized by hour of day, Federal Highway Administration (FHWA) vehicle class, and by direction. **Maps 1-3** show the counts by location for pre Camp Fire and post Camp Fire plus the net change. **Maps 1-3** can be found in **Appendix A** – **Maps** (file title Appendix A - Maps.pdf). **Charts 1-18** can be found in **Appendix B – Traffic Counts** (file title Appendix B-Traffic Counts.pdf).

After the fire, there was an overall reduction in traffic volume of 3%. **Chart 1** compares pre- and post-Camp Fire average total daily volume at each count location and **Chart 2** shows the difference between pre- and post-Camp Fire average total daily volume. Total volume decreased at 18 of the 54 locations. At locations where the total volume decreased, the average reduction was 37%; while at locations where the volume increased, the average increase was 20%. Notable increases were measured at:

Chico
- East Ave east of Esplanade Rd, +5,076 (+21%)
- Cohasset Rd south of East Ave, +4,082 (+19%)
- Esplanade Rd south of East Ave, +3,777 (+18%)
- East 1st Ave west of Sherman Ave, +3,693 (+21%)

Oroville
- 18th St north of Oro Dam Blvd (+29%)
- Montgomery St west of Table Mtn Blvd (+13%)
- Orange Ave west of Acacia Ave (+21%)

Unincorporated County
- Aguas Frias Rd south of Durham Dayton Rd (+68%)
- Los Verjeles Rd south of La Porte Rd (+39%)
- Lower Wyandotte Rd west of Alverda Dr (+44%)

Notable decreases were measured at:

Paradise
- Clark Rd north of Pearson Rd, (-49%)
- Skyway south of Pearson Rd, (-30%)
- Clark Rd north of Wagstaff Rd, (-54%)
- Pearson Rd east of Clark Rd, (-61%)
- Bille Rd east of Skyway, (-65%)

Chico
- Skyway south of Bruce Rd (-15%)

- W 3rd east of Ivy St (-12%)

Unincorporated County

Skyway east of Cliffhanger Ln (-23%)

Vehicle Class (Type)

The 13 FHWA classes were aggregated into three groups: 1) passenger vehicles and lightweight trucks, 2) medium-duty[8] trucks, and 3) heavy-duty[9] trucks. In cases where count data was available for the same location from multiple days, outlier counts beyond three standard deviations of the mean were discarded. Then, for each location, average daily totals, shares, and changes in volume were calculated for pre- and post-fire conditions.

Average daily passenger vehicle (i.e., cars and light trucks) volumes are illustrated in **Chart 3** and the difference in passenger vehicle volumes between pre- and post-Camp Fire is shown in **Chart 4**. There was an overall reduction of 11% in passenger vehicle volume, which decreased at 23 of the 54 locations. At locations where the passenger vehicle volume decreased, the average reduction was 38%; while at locations where the volume increased, the average increase was 13%. Notable increases were measured at the following locations:

Chico

- East Ave east of Esplanade Rd, (+25%)
- Cohasset Rd south of East Ave (+19%)
- Esplanade Rd south of East Ave (+17%)

Oroville

- Orange St west of Acacia Ave (+17%)
- 18th St north of Oro Dam Blvd (+18%)

Unincorporated County

- Lower Wyandotte Rd west of Alverda Rd (+33%)
- Aguas Frias Rd south of Durham Dayton Rd (+40%)
- Richvale Hwy east of Midway (+41%)

Notable decreases were measured at the following locations:

Chico

- Skyway south of Bruce Rd (-15%)
- W 3rd east of Ivy St (-12%)

[8] Class 3 – Medium Duty includes flat-bed trucks, box trucks, and extended bed cargo vans with a GVWR of 10,001 to 14,000 lbs. and 6 tires or more; Class 4 – Medium Duty includes delivery vans, small buses, and conversion vans about the size of an ambulance with a GVWR or 14,001 to 16,001 lbs. and 6 tires or more; Class 5 – Medium Duty includes RVs, dump trucks, or medium-size refrigerated trucks with a GVWR of 16,001 to 19,500 lbs. and 6 tires or more; and Class 6 – Medium Duty includes buses and medium size cargo or delivery trucks with a GVWR of 19,501 to 26,000 lbs. and 6 tires or more.

[9] Class 7 – Heavy Duty includes large delivery trucks and tractor-trailer combinations with a GVWR of 26,001 to 33,000 lbs. and 6 tires or more and Class 8 – Heavy Duty includes motor coaches, all tractor-trailer combinations, refuse trucks, and construction vehicles with a GVWR of 33,001 or more and 10 or more tires.

Paradise

- Clark Rd north of Pearson Rd, (-63%)
- Skyway south of Pearson Rd, (-41%)
- Skyway east of Cliffhanger Ln, (-37%)
- Skyway east of Bruce Rd, (-31%)
- Pearson Rd east of Clark Rd, (-73%)
- Clark Rd north of Wagstaff Rd, (-63%)
- Bille Rd east of Skyway, (-74%)

Unincorporated County

- Skyway east of Cliffhanger Ln (-37%)

Average daily shares of passenger vehicles at each location are shown in **Chart 5** and the difference in passenger vehicle shares between pre- and post-Camp Fire is shown in **Chart 6**. While passenger vehicles accounted for more than 60% volume at every location post-fire, the share still decreased at 49 out of 54 locations. At these 49 locations, on average, a reduction in the share of passenger vehicles of 12% was observed. The locations with the highest volume reductions also saw the largest drops in passenger vehicle share.

Average daily medium truck volumes are illustrated in **Chart 7** and the difference in medium truck vehicles between pre- and post-Camp Fire is shown in **Chart 8**. In aggregate, across all locations, medium truck volumes increased by 206%, virtually tripling from pre-fire counts. Medium truck volumes increased at 53 out of 54 locations. The largest increases were measured at:

Chico

- Skyway south of Bruce Rd (+489%)

Paradise

- Elliot Rd east of Clark Rd (+2,532%)
- Skyway south of Pearson Rd, (+318%)
- Pearson Rd east of Clark Rd (+1,323%)

Unincorporated County

- Skyway east of Cliffhanger Ln +292%)

Average daily shares of medium-duty trucks are shown in **Chart 9** and the difference in medium truck shares between pre- and post-Camp Fire is shown in **Chart 10**. The share of medium trucks relative to total volume increased at 53 of the 54 locations. On average, the increase in medium truck share observed was 11%. However, at 25% of the locations, increases of 15% or higher were observed.

Average daily heavy-duty truck volumes are illustrated in **Chart 11** and the difference in heavy truck vehicles between pre- and post-Camp Fire is shown in **Chart 12**. In aggregate, heavy truck volume decreased by 38% across all locations. Heavy truck volumes decreased at 40 of 54 locations, decreasing by 64% on average. The largest decrease was measured at East Avenue East of Esplanade Road: -1,137 (-76%). Notable increases in volume were measured at:

Chico
- Skyway east of Bruce Rd, (+78%)
- Cohasset Rd north of Eaton Rd, (+602%)

Paradise
- Wagstaff Rd west of Pentz Rd, (+387%)
- Pentz Rd north of Pearson Rd (+179%)

Unincorporated County
- Skyway east of Cliffhanger Ln, (+254%)

Average daily shares of heavy trucks are shown in **Chart 13** and the difference in heavy truck shares between pre- and post-Camp Fire is shown in **Chart 14**. The share of heavy trucks decreased at 38 out of 54 locations. Heavy trucks accounted for less than 4% of the total volume at all locations in the post-fire data. At Richvale Hwy east of Midway, the heavy truck share was highest before the fire, 12%. This decreased by a range of 10% to 2%. Other locations where heavy truck share decreased from larger percentages compared to before the fire are Chico River Road west of Alberton Road, B Street east of First Street, East Avenue east of Esplanade Road, and Aguas Frias Road south of Durham Dayton Road.

Speed

Vehicle counts at 54 locations were aggregated into four speed bins: 0-30 mph, 30-50 mph, 50-70 mph, and 70+ mph. The preprocessing methodology followed for this data was like the methods for the class counts data, including removal of outliers from multi-day counts. After preprocessing, the data from before and after the fire were compared.

The volumes of vehicles traveling at speeds between 0-30 mph at each location are displayed in **Chart 15**. Overall, volume in this bin increased by 10% across all locations. The volume of vehicles in this bin increased at 32 of 54 locations. Notable increases were measured at:

- Cohasset Rd south of East Ave (+40%)
- East 1st Ave west of Sherman Ave (+70%)
- Park Ave north of E Park Ave (+65%)

Notable decreases were seen at:

- Skyway south of Pearson Rd (-58%)
- Pearson Rd east of Clark Rd (-68%)
- Clark Rd north of Wagstaff Rd (-92%)

The volumes of vehicles in the 30-50 mph bin before and after the fire are displayed in **Chart 16**. In aggregate, there was a 7% decrease in volumes across all locations, with volumes decreasing at 32 of 54 locations. Notable decreases were measured at:

Chico
- W 3rd St east of Ivy St (-78%)

Paradise
- Clark Rd north of Pearson Rd (-64%)
- Bille Rd east of Skyway (-87%)
- Wagstaff Rd west of Pentz Rd (-89%)
- Pentz Rd north of Wagstaff Rd (-53%)
- Elliot Rd east of Clark Rd (-86%)
- New Skyway east of Pentz Rd (-25%)

Unincorporated County
- Aguas Frias Rd south of Durham Dayton Rd (-84%)

The volumes of vehicles traveling at speeds between 50 mph and above are displayed in **Chart 17**. This volume decreased at 35 of 54 locations, leading to an aggregate decrease of 26% after the fire. The largest volume decreases were measured at:

Chico
- Bruce Rd north of Skyway (-99%)
- Skyway east of Bruce Rd (-17%)

Paradise
- Clark Rd north of Wagstaff Rd (-39%)

Unincorporated County
- Skyway east of Cliffhanger Ln (-19%)
- Durham Pentz Rd east of SR 99 (-53%)

The relationship between total volume and truck volume is shown in **Chart 18**. The lower volume roads have higher truck percentages while the higher volume roads have lower truck percentages. Roadways such as Skyway connecting the major destinations have middle of the range volumes and truck percentages since there are few alternative routes.

Travel Patterns

Large Employer Commute Surveys

Surveys were developed for employees of large employers to gather information about travel behavior and new mobility options. Highlights of the 165 large employer survey results are noted below. Overall, the need to make more than one stop and the difficulty of finding a carpool/vanpool results in the large single-occupant commute.

- 50% of respondents need to make other stops or prefer to drive their own car, 39% cannot get home in an emergency, 35% find it difficult to organize carpool/vanpool, and 34% work irregular hours. The existing schedule and routes do not align with 37% of respondents' commute hours.
- Over 90% of respondents have Saturday and Sunday off

- Shift start: Before 7 AM (17%), 7-8 AM (26%), 8-9 AM (37%), 9 AM (15%)
- Shift End: Before 4 PM (22%), 4-5 PM (32%), 5-6 PM (52%)

- When asked what incentives would motivate people to not drive alone, 66% responded financial incentives; 36% responded guaranteed ride home; 33% biking access; 27% showers and lockers; and 25% shuttle between transit and work. With the responses not being mutually exclusive, some combination of these factors may be most effective.[10]

Butte County Travel Survey

The Butte County Travel Survey was administered online and at pop-up events to collect information from the public on commute patterns and household demographics. Of those surveyed (66), nearly all are employed and drive alone for their commute of 20 minutes or shorter. Personal safety, vehicle speeds, and the lack of a complete active transportation network were the main reasons for not walking or biking. This is consistent with the employer survey where most people drive and might walk or bike if they felt safe in terms of personal security and from collisions (fast moving vehicles or lack of infrastructure).

Highlights from the Butte County Travel survey are summarized below. Travel pattern charts **19-25** can be found in **Appendix C – Travel-Demgraphics-Econonomics-1** (file title Appendix C – Travel-Dem-Econ-1.pdf)**.**

Chart 19 shows the primary mode of travel for those who are employed, students, or neither. All respondents were either employed (66 people, 98%) or in school (1 person, 2%) and had their primary mode of transport being drive alone (58 people, 85%) with carpool/vanpool (5 people, 7.5%) being the second most used mode.

Chart 20 shows the number of people per household who regularly use B-Line compared to those who do not regularly use B-Line. The more people per household, the less likely someone is to use B-Line regularly. This is consistent with the transit survey describing the per person fare of transit compared to the fixed cost of driving relative to the number of people traveling.

Chart 21 shows the number of vehicles (car, motorcycle, or scooter) available for those who regularly use B-Line compared to those who do not regularly use B-Line. The more vehicles per household, the less likely someone is to use B-Line regularly. This is consistent with the transit survey describing the lack of vehicles available or that using a personal vehicle would cause an inconvenience for another household member.

Chart 22 shows the household income for those who regularly use B-Line compared to those who do not regularly use B-Line. Although there is one response for each of the income groups who do regularly use B-Line, the higher income groups not using B-Line is consistent with the transit survey.

[10] Respondents were allowed more than one response.

Chart 23 shows the gender for those who regularly use B-Line compared to those who do not regularly use B-Line. The split between female and male is roughly equal in those who do not take B-Line. Although not a statistically significant difference due to low sample size, there are 4 (4%) females and 1 (1%) male who regularly use B-Line.

Chart 24 shows reasons for not taking B-Line for only those who are not B-Line regulars and do not have or are unsure if they have transit serving their area (20 people, 26%). Of those without service, approximately half of the respondents prefer to drive (11 people, 55%) with the next most common reason being that the service does not go where or when they need it (9 people, 45%) or the service is too expensive (9 people, 45%). Note that the responses sum to over 100% since respondents could select multiple answers.

Since there were no clear patterns for the overall survey based on income, **Chart 25** shows the household income for those currently not using B-Line regularly because it does not serve their area but responded they would take transit if it were offered. The number of responses of people who said they do not currently use B-Line but would if it were offered in their area is fairly low, so the results are not statistically significant and are a similar distribution to the income of the overall survey.

Public Outreach

Pop-up events were organized in November and December 2019 to gather input on how to improve multimodal transportation in Butte County. Similar to the results found in the other surveys, improving infrastructure (facilities and parking) and personal safety would encourage more active transportation, and improving the access and quality of service (frequency and hours of operation) would encourage more transit usage. Some of the most interesting highlights from the survey centered around the issue of what things keep people from walking or bicycling more frequently:

- Issues walking outside: 34% missing sidewalks, 30% unsafe crossing/intersection, 26% personal safety
- Issues biking: 37% no bike paths/lanes, 35% high car traffic speed/volume, 15% no place to park bike at destination

Cellphone Data

Travel datasets from anonymized cellphone data representing trip counts between census blocks and organized by time of day, weekend vs weekday, and trip purpose, were collected in September-October 2018 and September-November 2019 by Teralytics. A separate equivalency was utilized to aggregate the data from the census block level to city and county levels.

Travel pattern, demographic, and economic **Charts 26-90** can be found in **Appendix D – Travel-Demgraphics-Economics-2** (file title Appendix D – Travel-Dem-Econ-2.pdf)

Total trip volumes in Butte County for weekdays and weekends are shown in **Chart 26** and **Chart 27**, respectively. A 4% decrease in number of weekday trips was observed from September 2018 to

September 2019. Between October 2018 and October 2019, this reduction was 1%. These can be considered marginal changes.

The changes in trip volumes for weekday trips in Butte County before and after the fire are presented in **Chart 28**. The changes for weekend trips are shown in **Chart 29**.

Trips Entering Butte County

Weekday counts are displayed in **Chart 30**, weekend counts in **Chart 31**, changes in weekday counts in **Chart 32**, and changes in weekend trips in **Chart 33**. Trips entering Butte County from other counties on weekdays increased by 15% between September 2018 and September 2019. The same type of trip count increased by 6% in October 2019. The change in weekday and weekend counts by county of origin for September are displayed in **Chart 34**. **Chart 35** presents the change in weekday trips by county for October. The change in weekend trips for September by county of origin is shown in **Chart 36.1** and for October in **Chart 36.2**. Trips from Yuba, Tehama, Sutter, and Glenn counties increased by 25%, 22%, 10%, and 8%, respectively, while trips from Yolo County decreased by 12% from September 2018 to September 2019. Trips from Tehama and Yuba counties to Butte County increased by 12% and 15% respectively, while trips from Sacramento (8%) and Yolo (19%) counties decreased significantly in October 2019 compared to October 2018.[11] Weekend trips most likely decreased due to: 1) a decrease in recreation travel into or out of the county, and/or 2) a decrease in trips by those who moved out the county and now needed to travel in/out of the county less frequently for their activities on the weekend.

Trips Leaving Butte County

Trips leaving Butte County on weekdays are shown in **Chart 37** and on weekends in **Chart 38**. Changes in weekday and weekend trips are shown in **Chart 39** and **Chart 40**, respectively. Trips exiting Butte County increased by 15% in September and by 6% in October from 2018 to 2019. The change in weekday trips leaving Butte County by county of destination for September and October is shown in **Chart 41** and **Chart 42**, respectively. Changes in weekend trips for September and October by county of destination are shown in **Chart 43** and **Chart 44**, respectively. In September, trips from Butte County to Yuba and Tehama counties increased by 26% and 23% respectively while trips to Yolo County decreased by 15%. Yolo County was the only destination to which trips decreased. In October 2019, the major increases were in trips from Butte County to El Dorado (30%), Tehama (12%), and Yuba (15%) counties, while trips to Yolo County decreased by 20%.

Trips Within Butte County

Trips within Butte County are shown in **Chart 45** for weekdays and in **Chart 46** for weekends. Trips within Butte County decreased by 9% in September 2019 and by 4% in October 2019. **Chart 47** through **Chart**

[11] A general note about the variations - There are variations in monthly travel. Data from September were compared to October within one year to compare the monthly variation to the difference pre- and post-Camp Fire conditions to determine if the change is a normal variation or an actual observed difference due to the fire.

54[12] present the top increases and decreases in trips between cities in Butte County for weekdays and weekends between September 2018 and October 2019. Trips between Chico and unincorporated areas of Butte County (+41%), as well as trips between Chico and Oroville (+29%), saw significant increases, while trips between Paradise and Chico (-19%), trips within Paradise, and between Paradise and unincorporated areas (-16%), as well as between Oroville and unincorporated areas (-18) saw significant reductions. From October 2018 to October 2019, trips from Chico to Oroville (+18%), Chico to unincorporated areas (+11%), and Chico to Gridley (+28%) increased significantly while the only major decrease was in trips from Chico to Paradise (-32%).

Trips by Purpose

Trips with at least one trip end in Butte County are shown for weekdays by Work-bound, Home-bound, and Other-bound trip purposes on **Charts 55-57**. Home-bound trip volume was approximately equal between September 2018 and September 2019 but increased by 16% between October 2018 and October 2019. Work-bound trip volume fell by 14% in September 2019 and by 11% in October 2019. Other trips decreased by 15% in September 2019 and by 10% in October 2019.

The top 10 increases and decreases in home-bound, work-bound, and other trips in September and October compared to 2018 are shown in **Charts 58-69**. Work trips to Chico increased the most (+14%). While not surprising that work trips to Paradise from all locations were in the top 10 decreases, work trips in the Unincorporated County also had a significant decrease (-43%). The largest increase by far for home-bound trips was between Chico and Oroville (+111%), while Paradise was the primary jurisdiction to have a reduction between all other locations of -63%. For other trips, Gridley had the largest increase (+21%), while trips within Paradise (-71%) and trips within Oroville (-56%) and between Chico and Orland (-50%) had the largest decrease.

Economics and Demographics

The residential and business location datasets consist of records of households and businesses from 2018 and 2019 from InfoGroup.[13] Individual residents, families, and businesses are provided unique identifiers,

[12] For Charts 51 and 52, when comparing changes, the primary focus is to compare before and after the Camp Fire rather than September to October. September before had many more observations than after, while October was relatively similar before and after. September in both before and after had more trips observed than October, so the main point of these charts is to reinforce the idea that there is variability of data and comparing September before and after separately to October before and after is important.

[13] Residential household (address, size, income, number of workers, number of vehicles, tenure) and business information (location, firm size, firm name, industry type, small business, estimated revenue, tenure) was collected at a disaggregated level. Residential information was collected from over 90 sources (i.e., real estate mortgages, voter registration, consumer transactions, offline subscriptions, school registrations, etc.) in 2018. In addition, information from over 4,000 business sources (i.e., business licenses, utilities, employee taxes, etc.) was also collected in Butte County in 2018. Each household and business location across the county were identified and verified quarterly as part of the standard business operating procedure. The Post Camp Fire Regional Population and Transportation Study team obtained the preexisting data for pre and post Camp Fire and evaluated the subset of households and businesses that were in Butte County in September or October 2018 and their location in [Butte County] or [Butte, El Dorado, Placer, Sacramento, Sutter, Yolo, and Yuba counties] in September or October 2019.

which can be used to investigate post-fire changes. The residential date is in units of households and the non-residential data are in units of businesses. Data for the person within household and employee within businesses are not available due to confidentiality.

Families and Residents

Pre- and post-fire records of households including detailed addresses, homeownership status, tenure, home values, household sizes, years of construction, etc., were utilized to understand the status of the county population. Records of 193,596 households in Butte County were listed in the 2018 dataset while records of 200,906 households in Butte County were listed in the 2019 dataset. 38,322 families (20%) – 41,935 residents – that were listed in the 2018 data were not listed in the 2019 data.[14] The American Community Survey (ACS) product from the Census for 2019 estimates 86,209 households consisting of 219,186 residents.

Migration

Family migration out of Butte County is shown in **Chart 70** and **Chart 71**. The largest migrations occurred from Chico (38%), Paradise (32%), Oroville (15%), and Magalia (8%) to cities outside Butte County. Primary relocation destinations include Sacramento County (30%), Placer County (24%) and Sutter County (21%). A substantial number of inter-city migrations was also observed from Paradise to Chico (66%). Other notable migrations within Butte County include Paradise to Oroville (16%) and to Unincorporated County (8%).

New Residents[15]

Chart 72 shows the distribution of new residents in 2019. The highest number of new residents (55%) was observed in Chico, followed by Oroville (22%), Paradise (7%), Magalia (5%) and Gridley (4%).

Tenure

Tenure of families in their current residences is shown in **Chart 73**. The share of families living in their current address for six months to one year decreased between 2018 and 2019, while the share of residents who had moved in the past six months increased.

---

[14] This was described in Task 1 memo. Residential information from over 90 sources (i.e., real estate/ mortgages, voter registration, consumer transactions, offline subscriptions, school registrations, etc.) and over 4,000 business sources (i.e., business licenses, utilities, employee taxes, etc.) were collected in Butte County in 2018. Using the residential and business data sources, each household and business location across the county were determined and verified quarterly as part of the data providers standard business. The Post Camp Fire Study obtained the preexisting data for pre- and post-Camp Fire and evaluated the subset of households and businesses that were in Butte County in September or October 2018 and their location in Butte County or outside of the county in September or October 2019. To maintain individual and household privacy, migration information was summarized at a city level or higher and when reporting cross classified attributes (i.e., household size and income) maintained minimum reporting sample of 50 households or greater.

[15] "New residents in 2019" means that the household was not located in the same jurisdiction or the household formation (i.e., people in the household) changed in 2019 compared to 2018

Home Value

The distribution of estimated home values from the InfoGroup data before and after the fire is shown in **Chart 74**. The median home value (approx. $210,000) did not change between 2018 and 2019. More than 25% of families lived in homes valued at less than $100,000. The share of families living in homes valued between $150,000 to $200,000 fell slightly. As a point of comparison, the ACS for 2019 estimated the median home value at $248,100. Zillow estimated the median home value at approximately $330,000 and estimates that home prices have increased by approximately 25% after the Camp Fire.

Year of Construction

The distribution of construction years for homes in 2018 and 2019 is shown in **Chart 75**. The share of families living in homes built in the 1970s and 1980s decreased in 2019, while the share of families living in homes built in the 1990s and 2000s increased. Houses built in the 2010s are the same in 2018 and 2019.

Home Ownership

Home-owning families constituted 80% in 2018. This dropped to 68% in 2019, resulting in a rise in renters from 20% to 33%. This is shown in **Chart 76**.

Household Size

The distribution of household size is displayed in **Chart 77**. Single-person households constituted more than 60% of the total despite this share dropping slightly in 2019. Small increases in shares of 3-, 4-, 5-, and 6-person households were observed resulting in an average household size in 2018 of 1.57 and in 2019 of 1.63. As a point of comparison, the ACS for 2014-2018 estimated the average household size of 2.55 people per household.

Businesses

Records of 12,702 businesses were listed in the 2018 dataset while records of 13,457 businesses were listed in the 2019 dataset. The total number of businesses in the dataset by industry type, year established, and number of employees is shown in **Charts 78-80**, respectively. Note that the values are in terms of businesses and not employees and are based on payroll taxes and other similar datasets described earlier in the report. When compared to the Economic Census data for 2019, the rank based on percentage of businesses and employees is similar for all business sectors.

Chart 78 shows the jobs by sector for both 2018 and 2019. The share of Health Care and Social Assistance businesses fell from 2018 to 2019 by -11% and the share of Retail Trade businesses decreased by 5%. The share of Non-Classifiable Establishments rose by 23%.

Chart 79 shows the year a business was established for both the 2018 and 2019 data. The largest fraction of businesses was established on or after 2000. This share decreased from 2019 to 2018. Shares of businesses established in the 1980s and 1990s also decreased while shares of businesses established in the 1950s and 1970s increased.

As shown in **Chart 80**, more than 85% of businesses had 10 or fewer employees both before and after the fire.

Lost Businesses

Businesses lost are shown in **Charts 81-87**.[16] Between 2018 and 2019, listed businesses with Butte County addresses decreased by 2,289 (18%); presumably, they closed. Notably, 688 businesses in the Health Care and Social Assistance industry (25%) were no longer listed. Among the lost businesses, 1,840 (80%) had five or fewer employees. This points towards the fact that small businesses were affected the most by the fire. Of the 2,289 businesses, 900 (39%) were lost in Paradise, with 956 (42%) lost in Chico, and 268 (12%) in Oroville. The businesses lost outside of Paradise may be due to the typical business turnover, the business owners relocating due to their house being destroyed, lack of business due to the evacuation, or other factors beyond those included in the data. Businesses with five or fewer employees accounted for 81% of the total businesses lost in Paradise.

New Businesses

Businesses that have either relocated to Butte County or have opened as new businesses are considered new establishments and are shown in **Charts 88-90**. After the Camp Fire, 271 businesses were established in Butte County in 2019. Among these, 39 were retail businesses. A substantial majority of newly started businesses (226, 83%) had five or fewer employees. The highest number of new businesses was seen in Chico (57%), followed by Oroville (18%), and unincorporated County (10%).

Migration

Between 2018 and 2019, 521 businesses in Butte County changed addresses. Of these, 116 moved to different cities (22%) and seven moved outside of Butte County (1%). Notably, 70 businesses moved from Paradise to Chico (13%). Many businesses moved out of Paradise to different cities including Magalia (2%), Marysville (2%), and Oroville (2%). Four businesses (0.7%) changed their address from a physical location to a PO Box.

Female-Owned Businesses

About 8% of businesses were female-owned in both 2018 and 2019.

Structure Status and Development

The countywide residential total decreased by 14,146 from 2017 to 2018 with 11,570 of the decrease within Paradise. Between 2018 and 2019, approximately 400 permanent structures were rebuilt along with 648 temporary structures. In Paradise, 32 single-family homes were reconstructed along with 373 temporary units, while there was a loss of one additional mobile home and 54 multi-family homes. Temporary homes were also constructed in Unincorporated Butte County (102 units), Chico (87 units), Magalia (39), and Oroville (3). Single-family structures within Paradise were reduced by 85%, multi-family

[16] These charts contain the term "non-classified". That is a designation that simply means that the business cannot be classified within one of the currently recognized industry categories.

structures were reduced by 71%, and mobile homes were reduced by 96%. A detailed summary of the residential development over time, and the pre and post Camp Fire data for Butte County combined and by jurisdiction can be found in **Table 1**.

Within Paradise, a total of 23% of all commercial development space was destroyed: This includes:

- Retail (55% of total retail space was destroyed)
- Office (50% of total office space destroyed)
- Medical/Public (45% of total medical/public space destroyed)
- Industrial (29% of total industrial space was destroyed)

A detailed summary of the commercial development over time, and the pre and post Camp Fire data for Butte County combined and by jurisdiction, can be found in **Table 2**.

Recovery Literature Review

To understand existing research and analogous case studies to the Camp Fire, a literature review of disaster recovery and displacement was performed. The two disaster recovery studies found to be most relevant to the Camp Fire were the Tōhoku Earthquake and Tsunami, Japan (2011) and Hurricane Sandy, United States (2012).

The 2011 earthquake and tsunami off the Pacific Coast of Japan in Tōhoku was the most powerful earthquake ever recorded in Japan that killed more than 10,000 people and resulted in $360 billion in damage. Research[17] found that nationwide recovery efforts are ongoing almost 10 years later. Community members have been highly engaged in the recovery process, which has contributed to slow consensus building around where and how to rebuild. This has also resulted in a mixed recovery pattern, with some areas redeveloping under similar development patterns to pre-disaster conditions, while other areas are choosing to rebuild with new development patterns.

Hurricane Sandy in 2012 was the deadliest and most destructive Category 3 hurricane in history, causing more than $70 billion in damage and claiming 233 lives. The recovery literature focuses on the storm's effects in New York and New Jersey although many other areas were affected. Other research on the 2012 Hurricane Sandy[18], namely the case studies of Oakwood Beach (New York) and Sea Bright (New Jersey), concluded different results on disaster recovery and displacement than those of the Tōhoku study. The Hurricane Sandy study noted a much shorter time frame (i.e., less than a year) for redevelopment and repopulation of the affected areas in both cities. The recovery patterns of both areas mirrored pre-disaster development.

A main difference between these two studies and the condition in the Camp Fire is the geographic area impacted directly due to the event. In the Camp Fire, the Town of Paradise was significantly impacted while other surrounding jurisdictions had less long-term impact, allowing for temporary housing and relocation to occur within Butte County. The transportation infrastructure serving Paradise has less significant damage, but the water, sewer, and power have similar levels of impact as the two study areas.

Census data was also utilized to measure disaster recovery and displacement. Demographic and socioeconomic effects of similar devastating wildfires to the Camp Fire in Northern California, including the Tubbs Fire and the Kincade Fire in Napa and Sonoma counties, respectively, were analyzed. However, the Census data lacks the level of precision and granularity to isolate the effects of these fires on demographic and socioeconomic conditions.

---

[17] Howitt, Arnold M. 2018. Recreating Livable Communities after Catastrophe: Managing the Recovery from Japan's Earthquake, Tsunami, and Nuclear Disaster of 2011. *Transportation Research Board TRID*.

[18] McNeil, Sue, Trainor, J., Greer, A., Israt, J., Mininger, K. 2016. Understanding the Relationships between Household Decisions and Infrastructure Investment in Disaster Recovery: Cases from Superstorm Sandy. *Transportation Research Board TRID*.

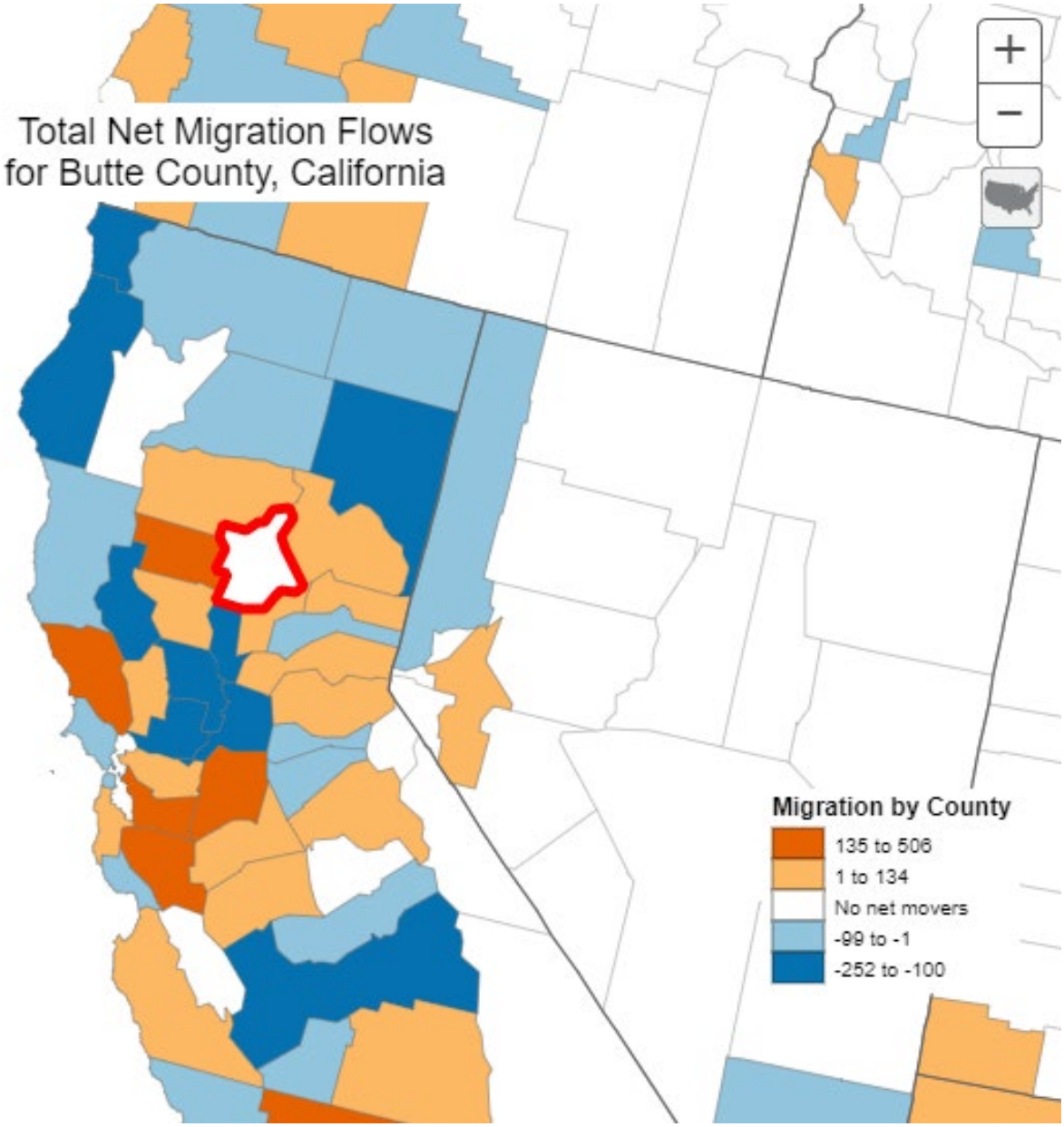
Census Flows Mapper

The Great Recession from 2007 to 2009 was reviewed as a proxy for measuring the larger effects of financial disasters compared to the Camp Fire. The Census Flows Mapper is an application that displays migration patterns by county in the United States[19]. Using this tool, migratory patterns in Butte County were evaluated from 2008 to 2012. A screenshot from this tool is provided below. The map shows the net change in inbound and outbound migration by county for the four-year period. The counties with positive numbers show that Butte County imported more residents from those counties than Butte County exported to those counties. The counties with a negative number are those where more people left Butte County for those counties than moved to Butte County from those counties.

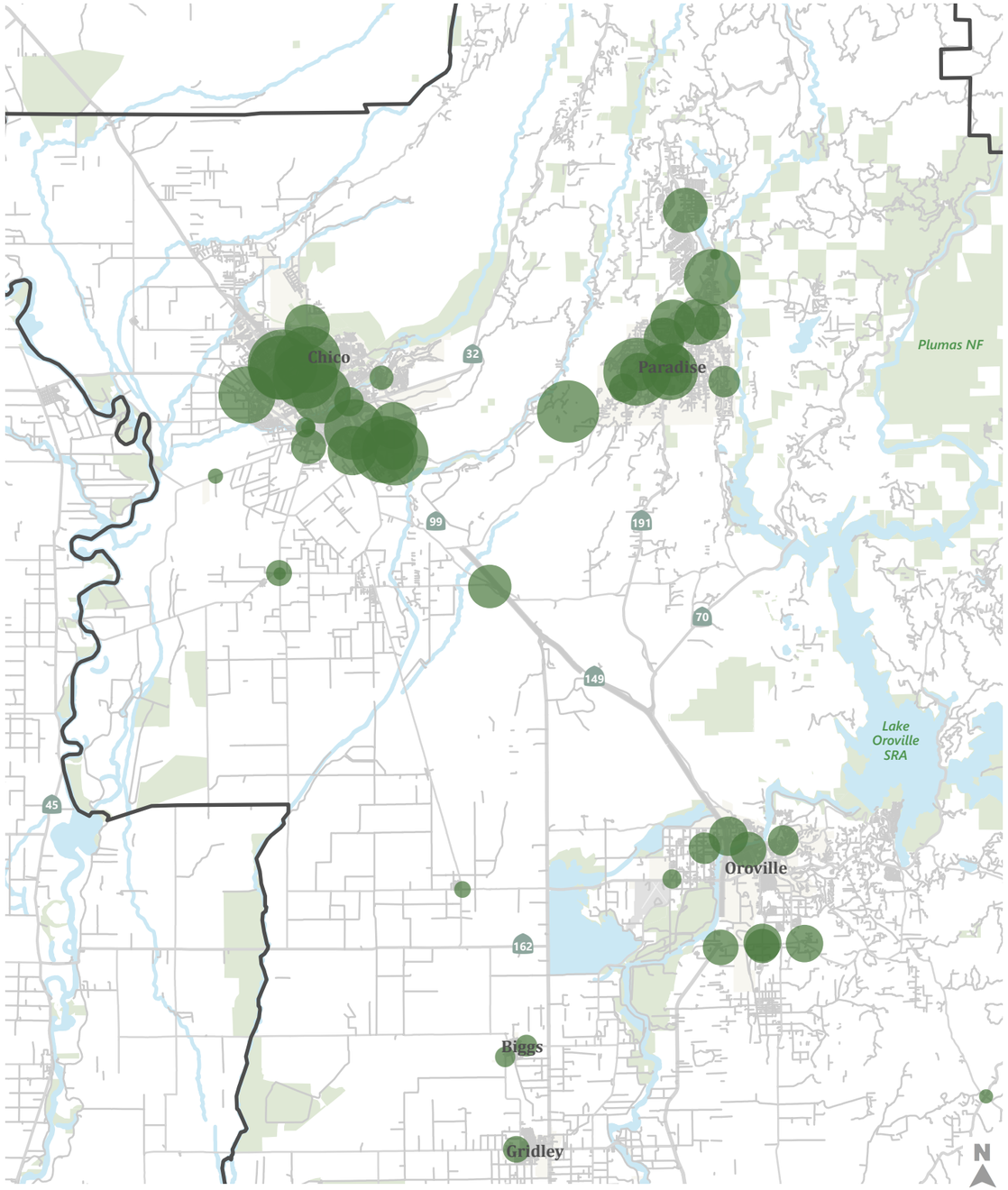
The map shows that Butte County had a net gain of residents coming from the Bay Area counties and the counties immediately surrounding Butte County. It also shows a net loss of residents between Butte County and Lassen, Lake, Yuba, Sutter, Humboldt, Del Norte, and Sacramento counties. Reasons for these flows may be due to financial and other cost of living concerns following the economic crisis. As noted, with the regional travel and household/employee migration, the types of household and worker are shown in terms of commute patterns. A major difference between the recession and the Camp Fire is that the structures were abandoned during the recession and the infrastructure was not damaged like during the Camp Fire, allowing for recovery of housing and non-residential buildings to be closer tied to economics than redevelopment.

The 2008 to 2012 data from the Census Flows Mapper tool was also compared to the most recent available data from 2013 to 2017. Many of the migratory trends in the 2013 to 2017 data are like the 2008 to 2012 migratory trends, such as a general inbound migration to Butte County from counties in the Bay Area. However, there is a noticeable increase in the amount of inbound migration to Butte County from the far northern California counties of Siskiyou, Modoc, Shasta, Lassen, Plumas, and Trinity.

[19] https://flowsmapper.geo.census.gov/map.html#



Source: Census Flows Mapper, 2020. https://flowsmapper.geo.census.gov/map.html#

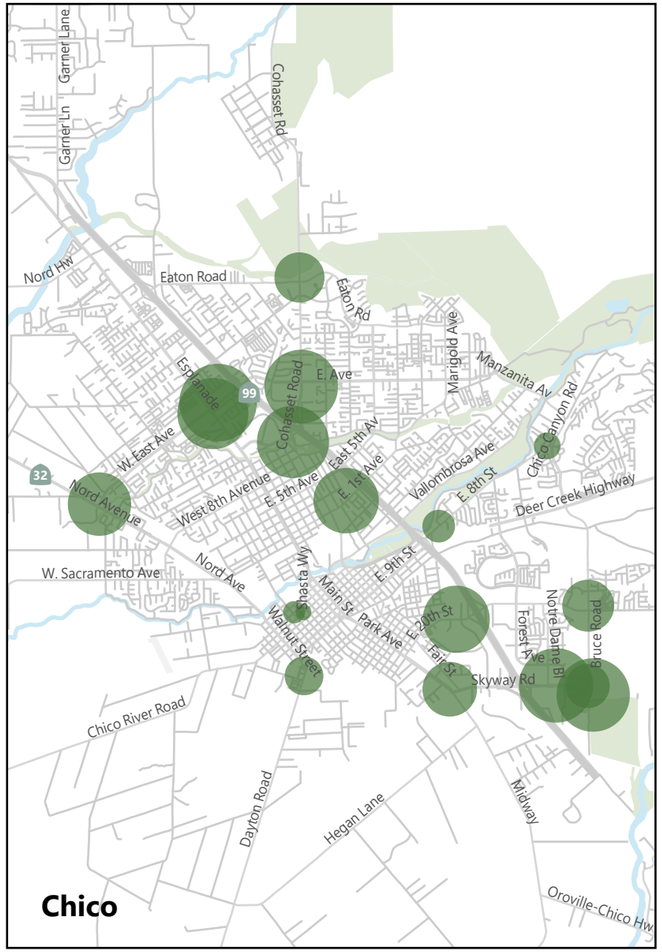


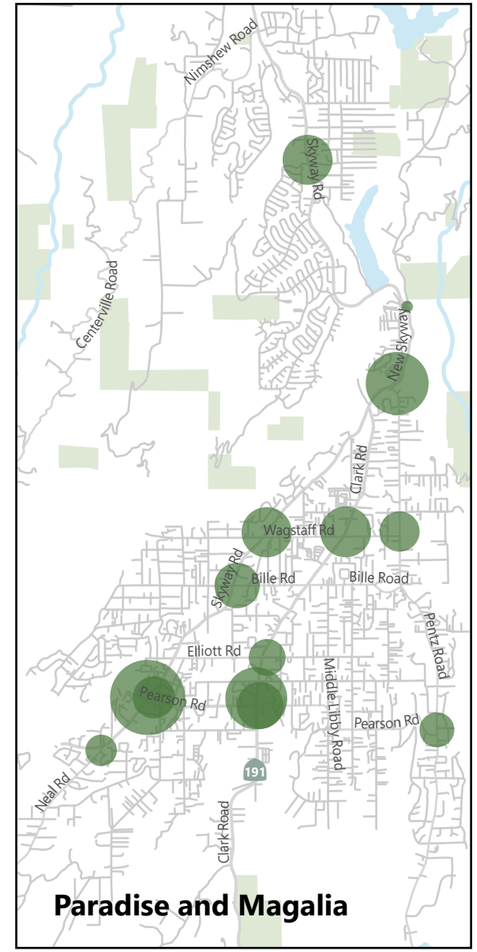
Average Daily Volume

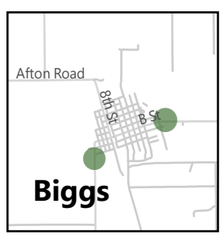
20,000
10,000
5,000
1,000

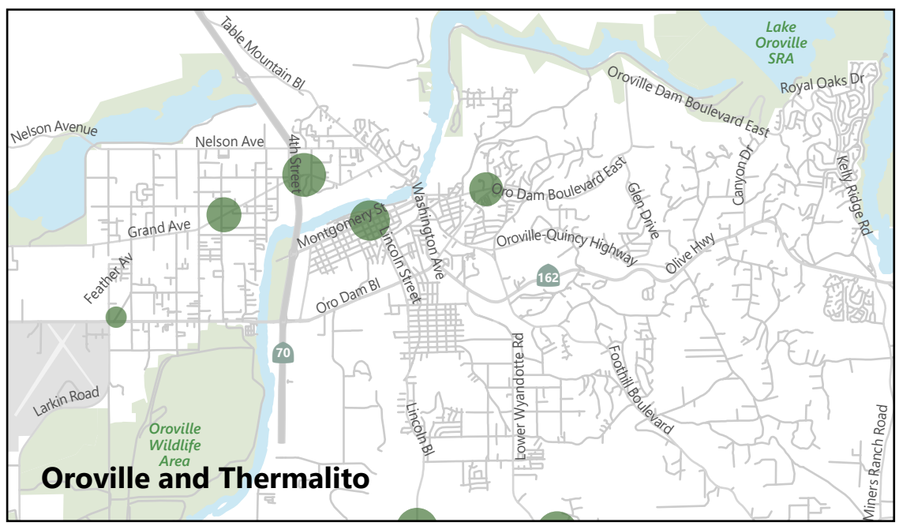
Map 1

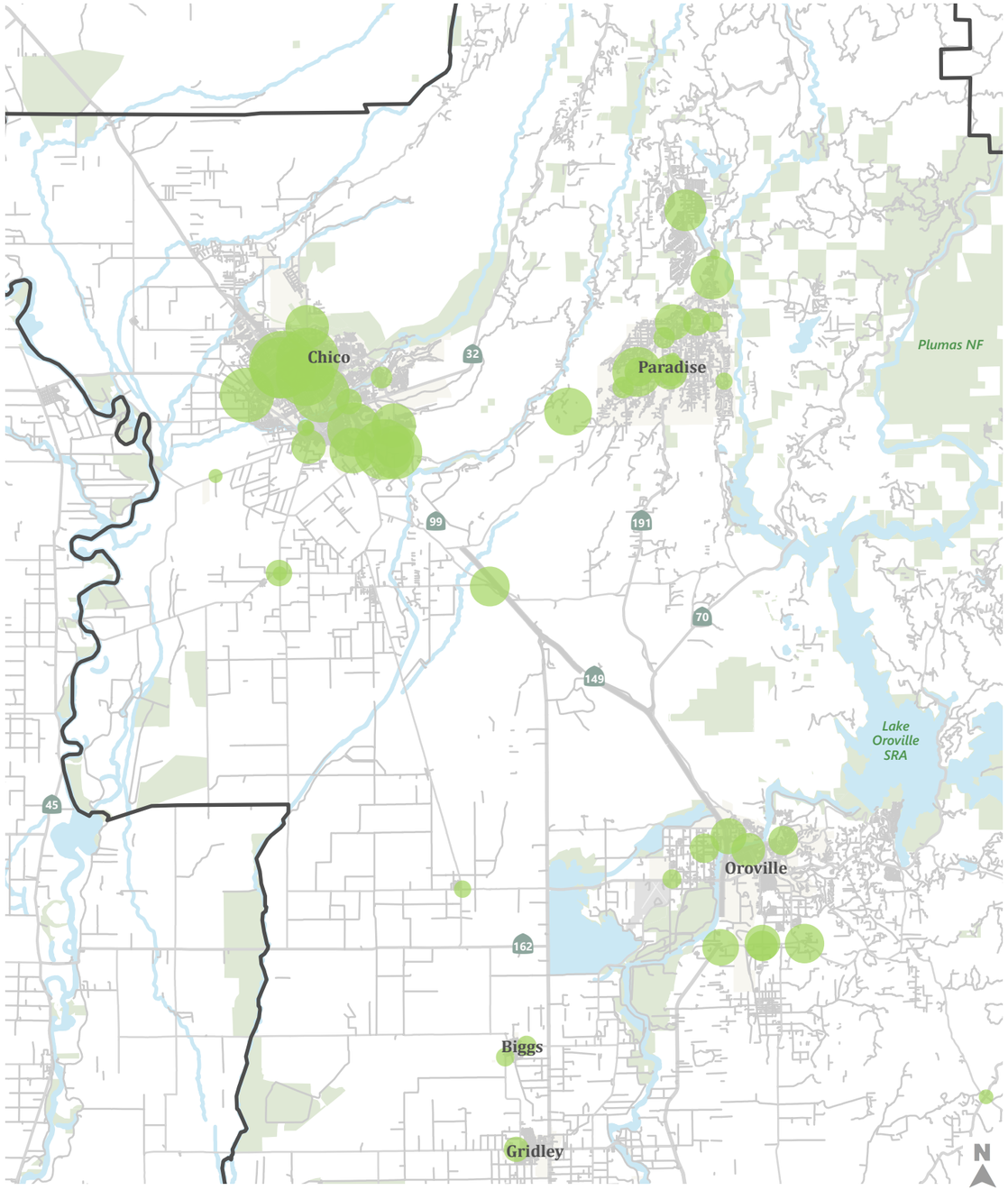
Average Daily Volume Pre-Camp Fire









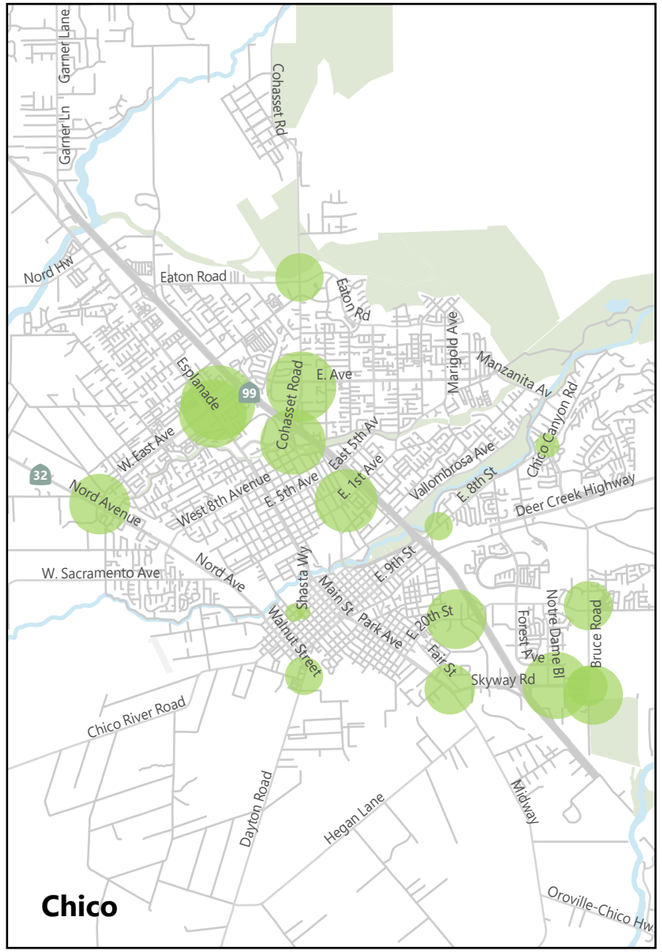


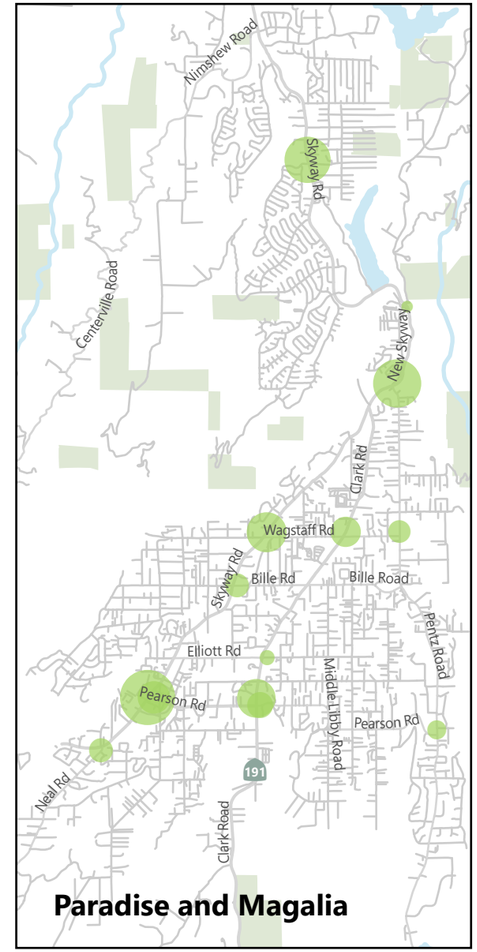
Average Daily Volume

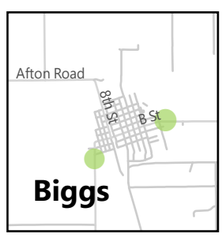
20,000
10,000
5,000
1,000

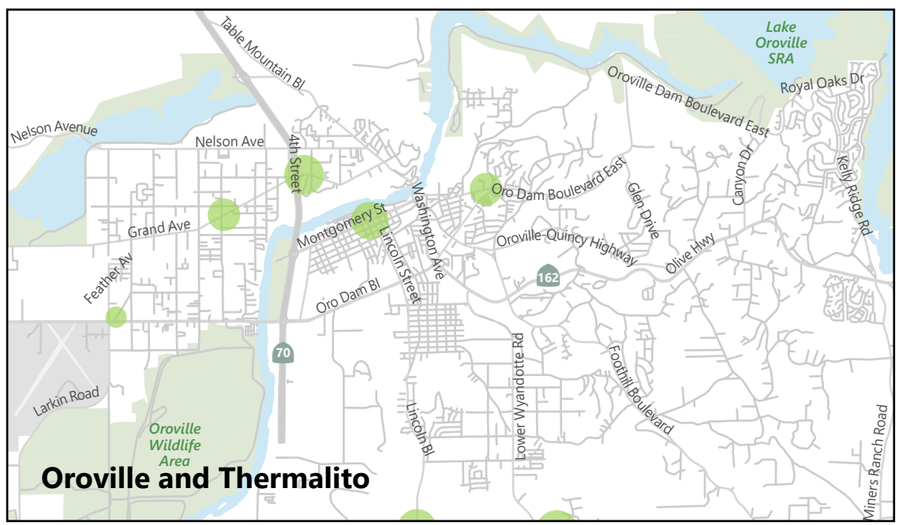
Map 2

Average Daily Volume Post-Camp Fire

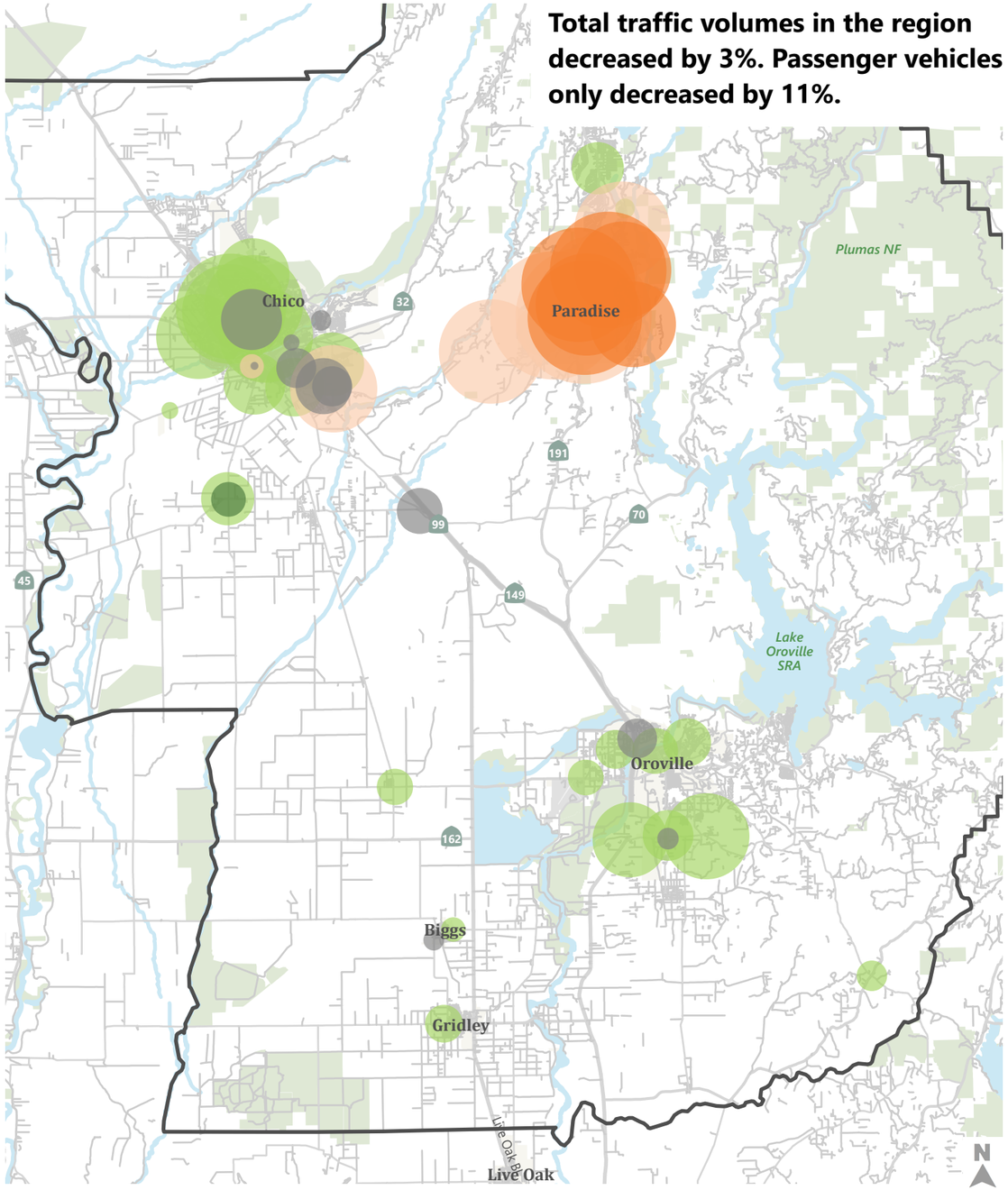








Total traffic volumes in the region decreased by 3%. Passenger vehicles only decreased by 11%.



Change In Average Daily Volume

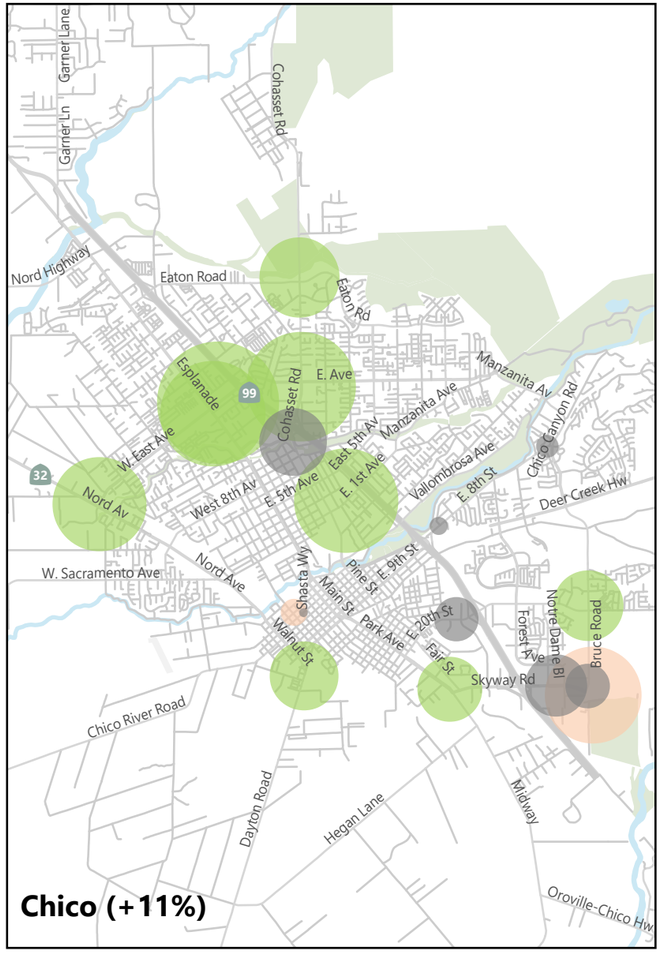
8,000
1,000
500
100

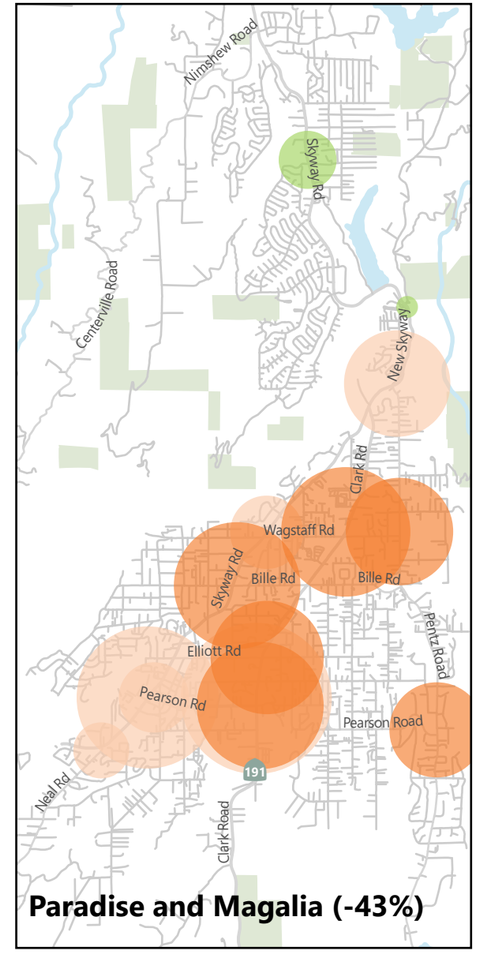
- 50% or Higher Increase
- 10%-50% Increase
- Less Than 10% Change
- 10%-50% Decrease
- 50% or Higher Decrease

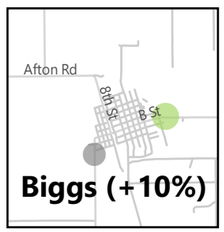
(+-xx%) Total Vehicle Percent Change

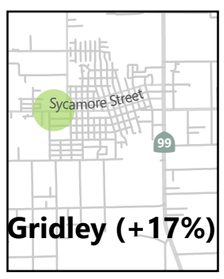
Map 3

Change In Average Daily Volume Post-Camp Fire









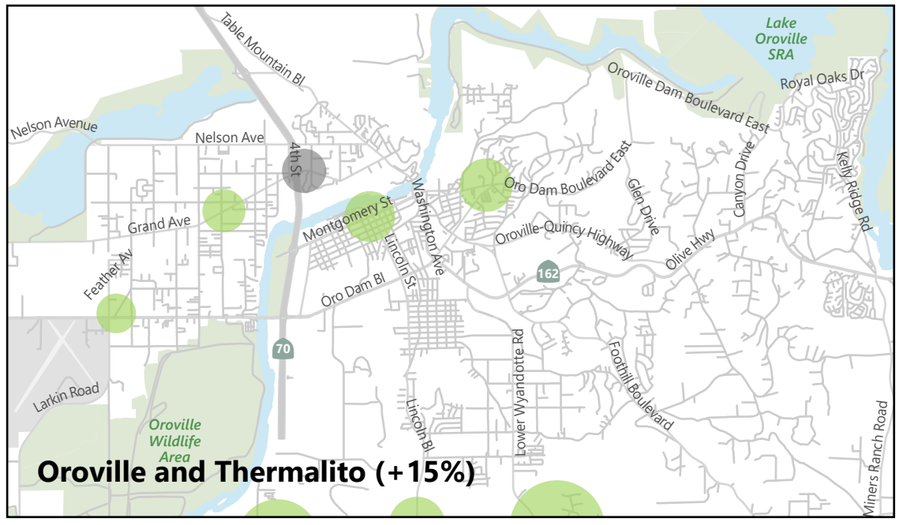


Chart 1: Average Total Daily Volume by Location

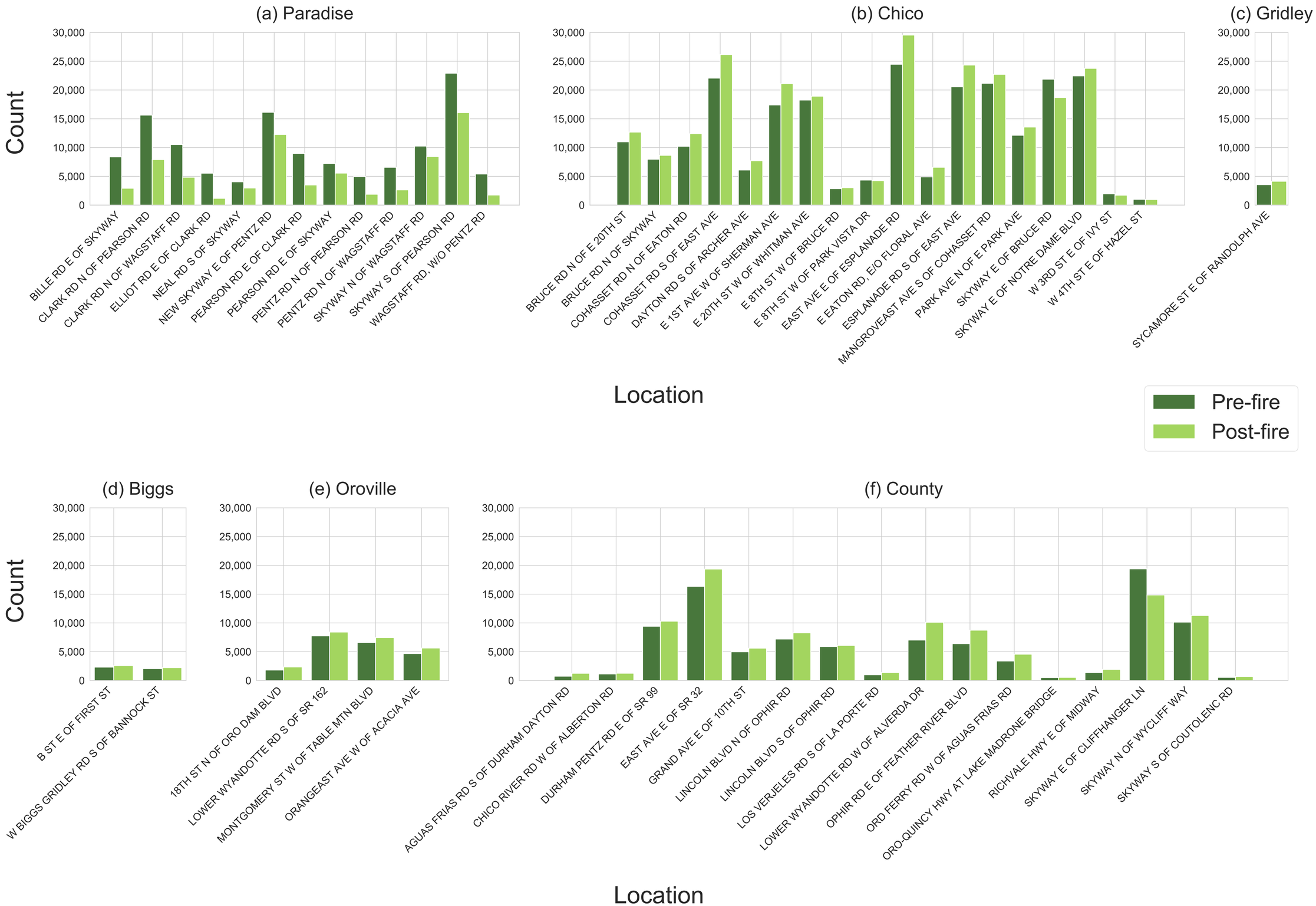


Chart 2: Difference in Average Total Daily Volume by Location

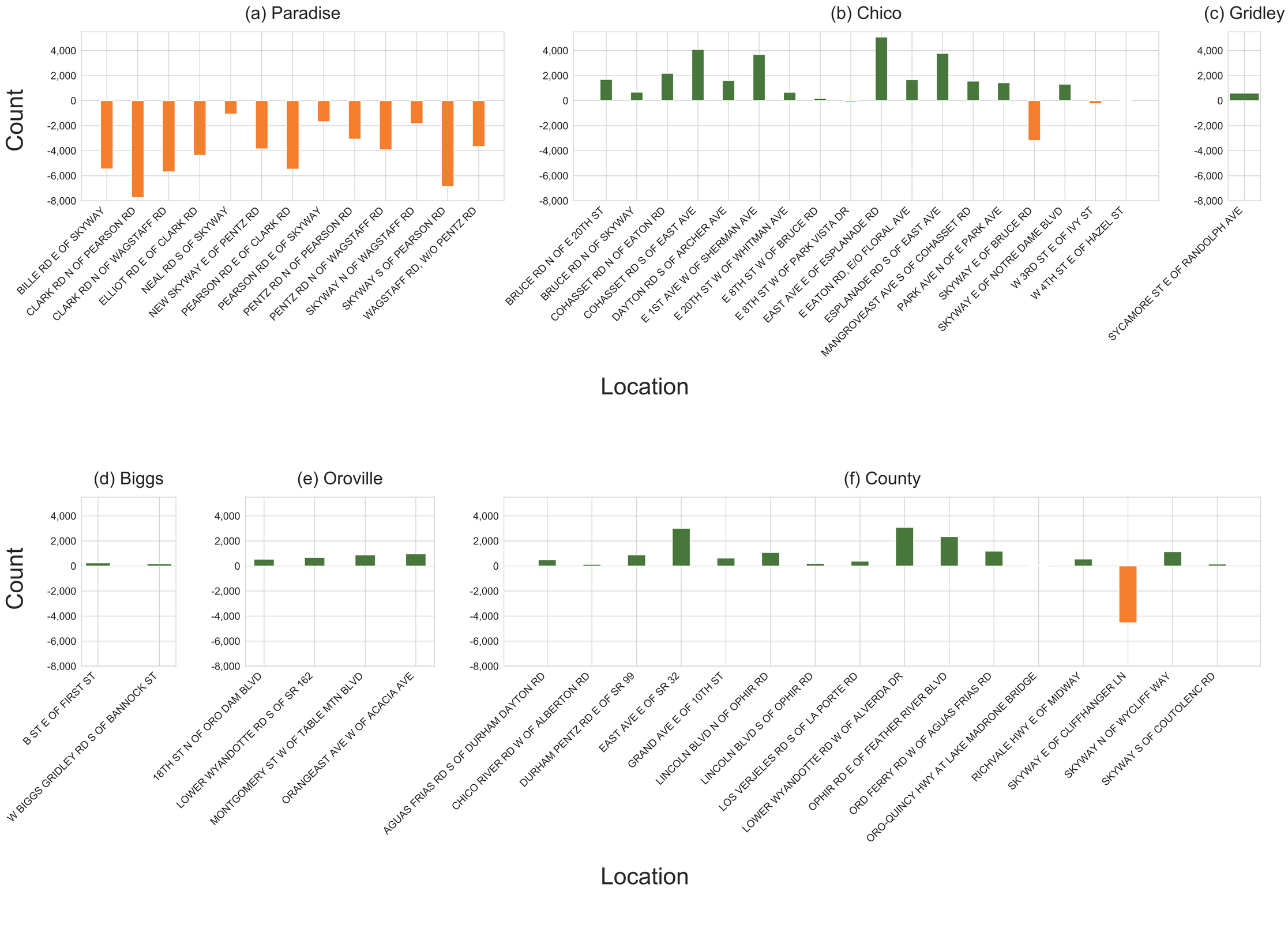


Chart 3: Average Daily Passenger Vehicle Volume by Location

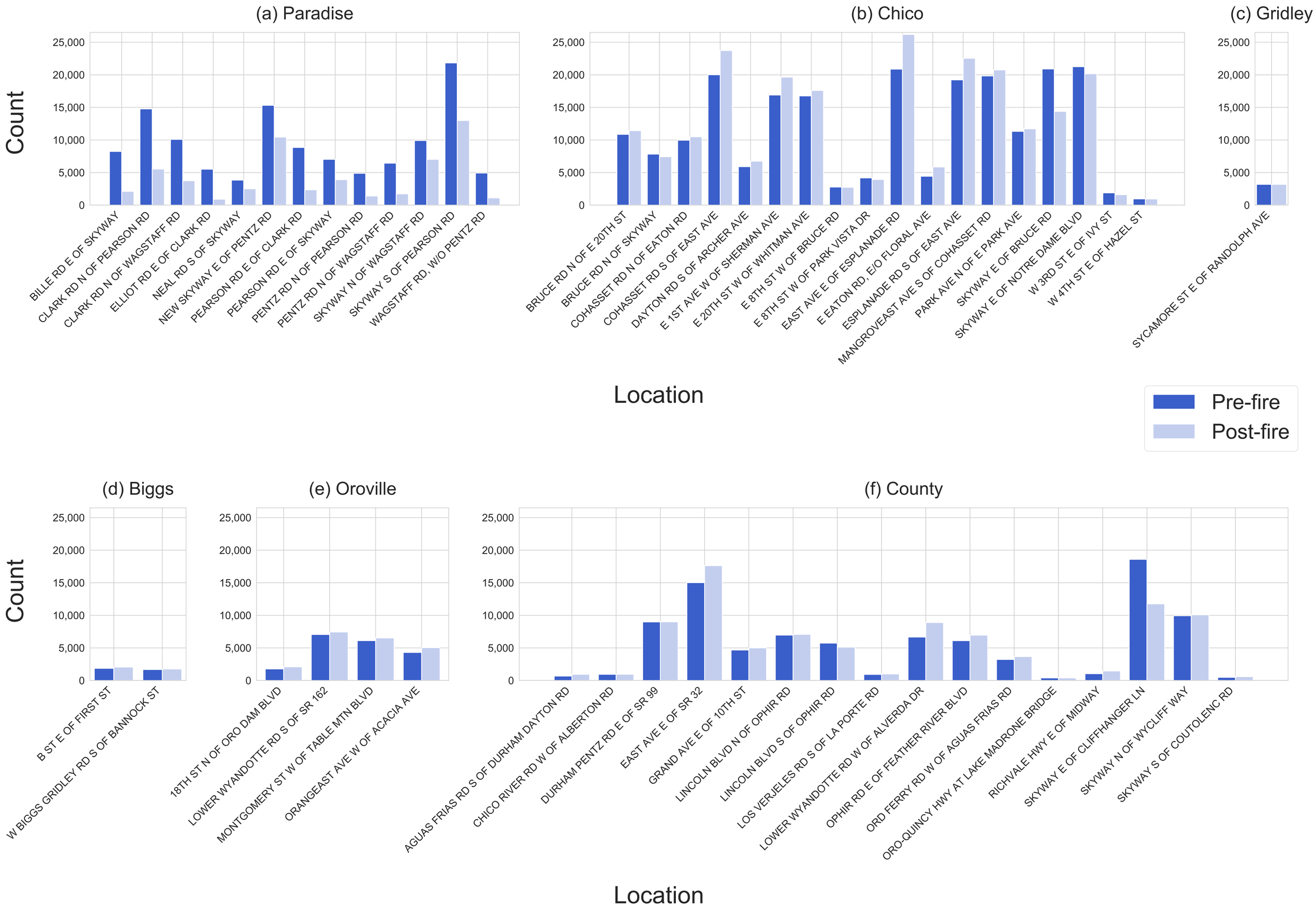


Chart 4: Difference in Average Daily Passenger Vehicle Volume by Location

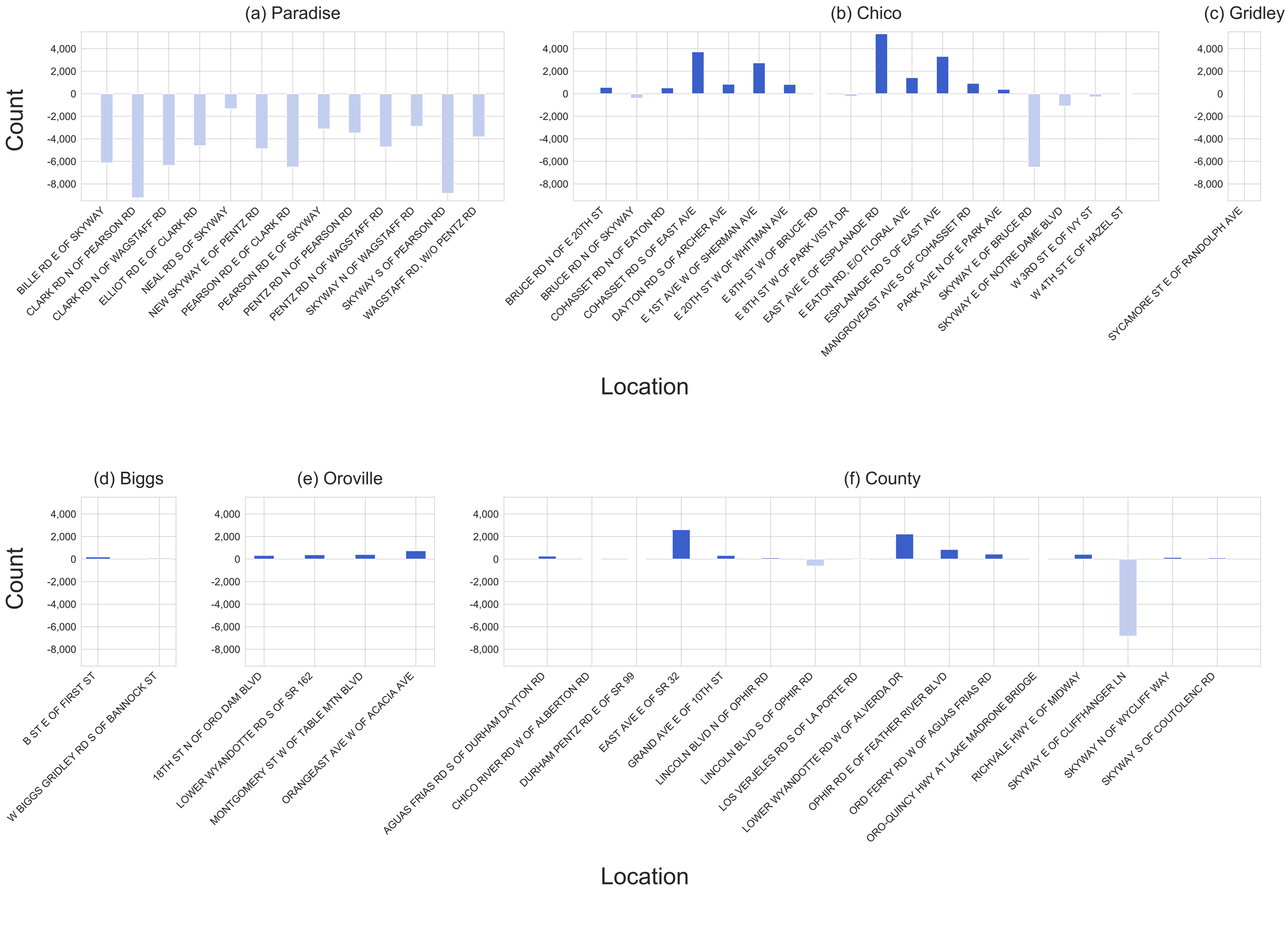


Chart 5: Average Daily Passenger Vehicle Share by Location

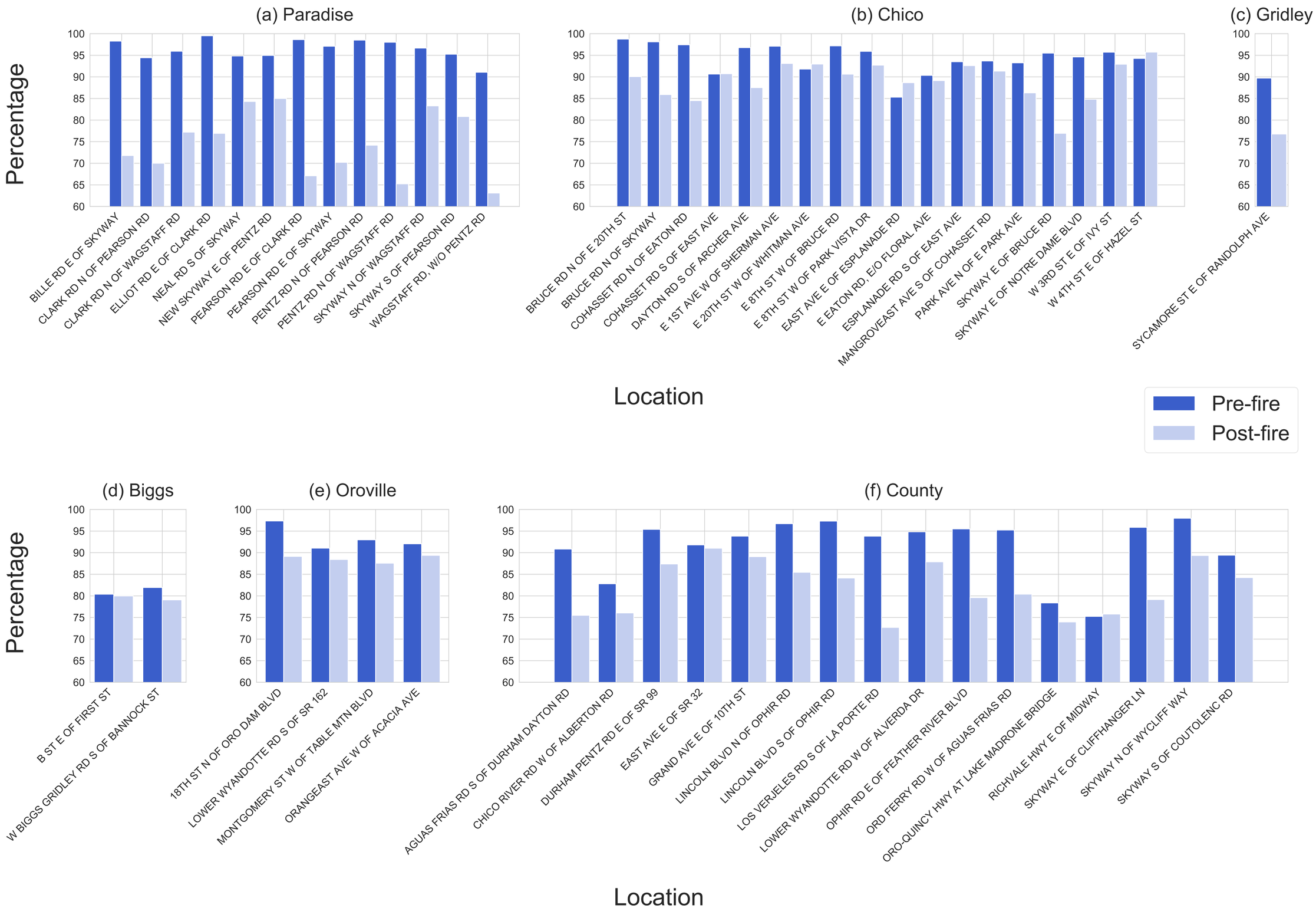


Chart 6: Difference in Average Daily Passenger Vehicle Share by Location

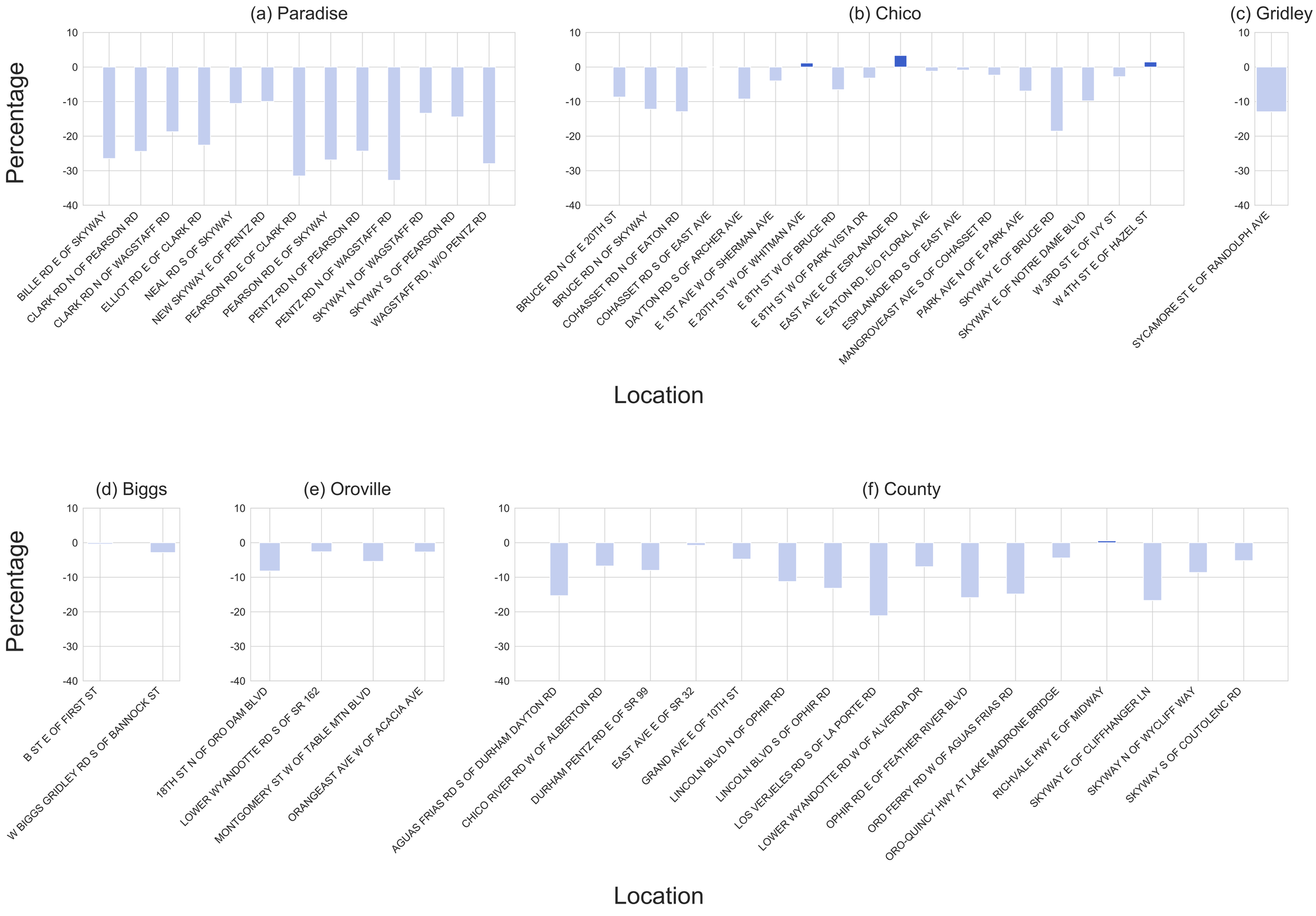


Chart 7: Average Daily Medium Truck Volume by Location

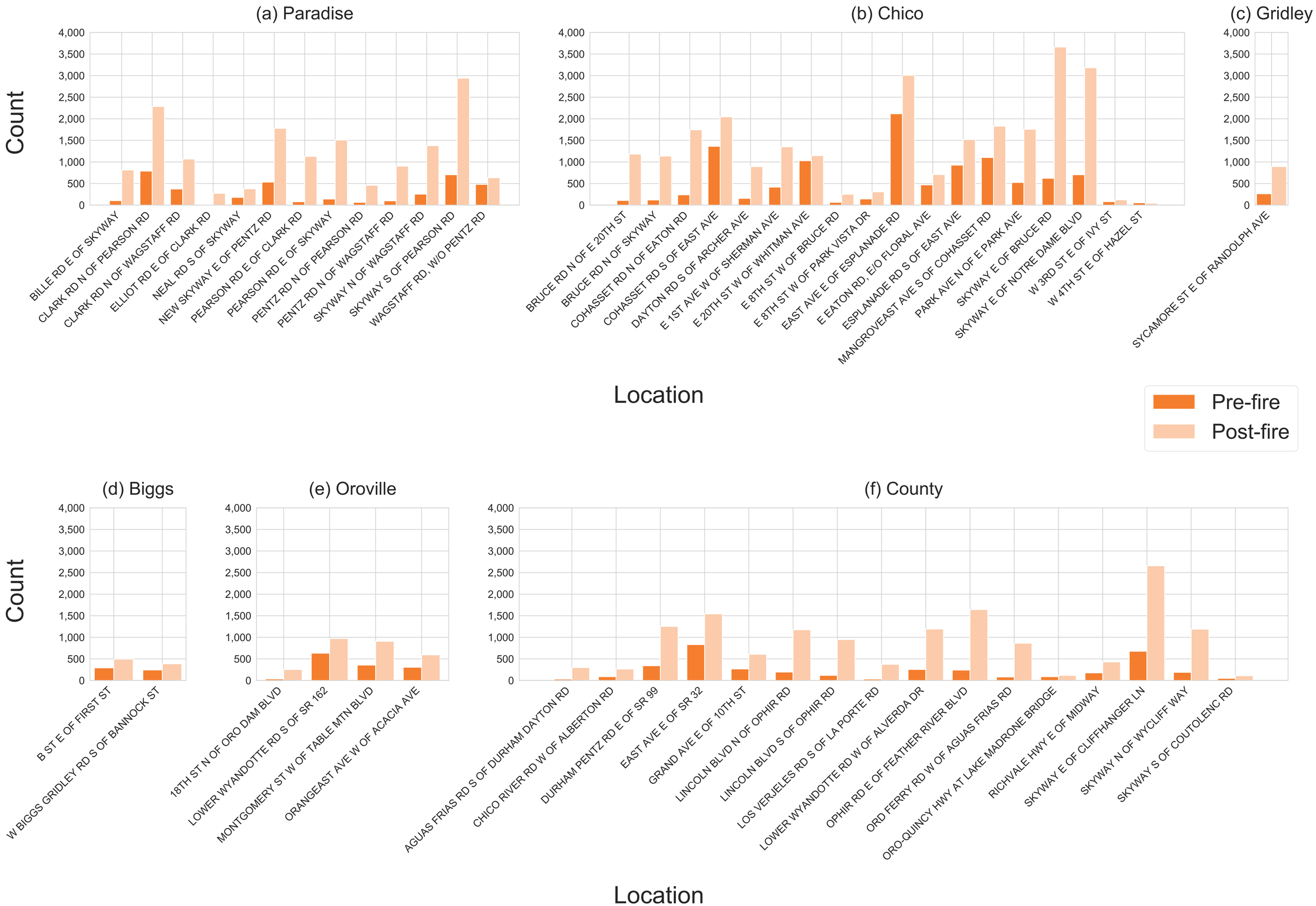


Chart 8: Difference in Average Daily Medium Truck Volume by Location

Chart 9: Average Daily Medium Truck Share by Location

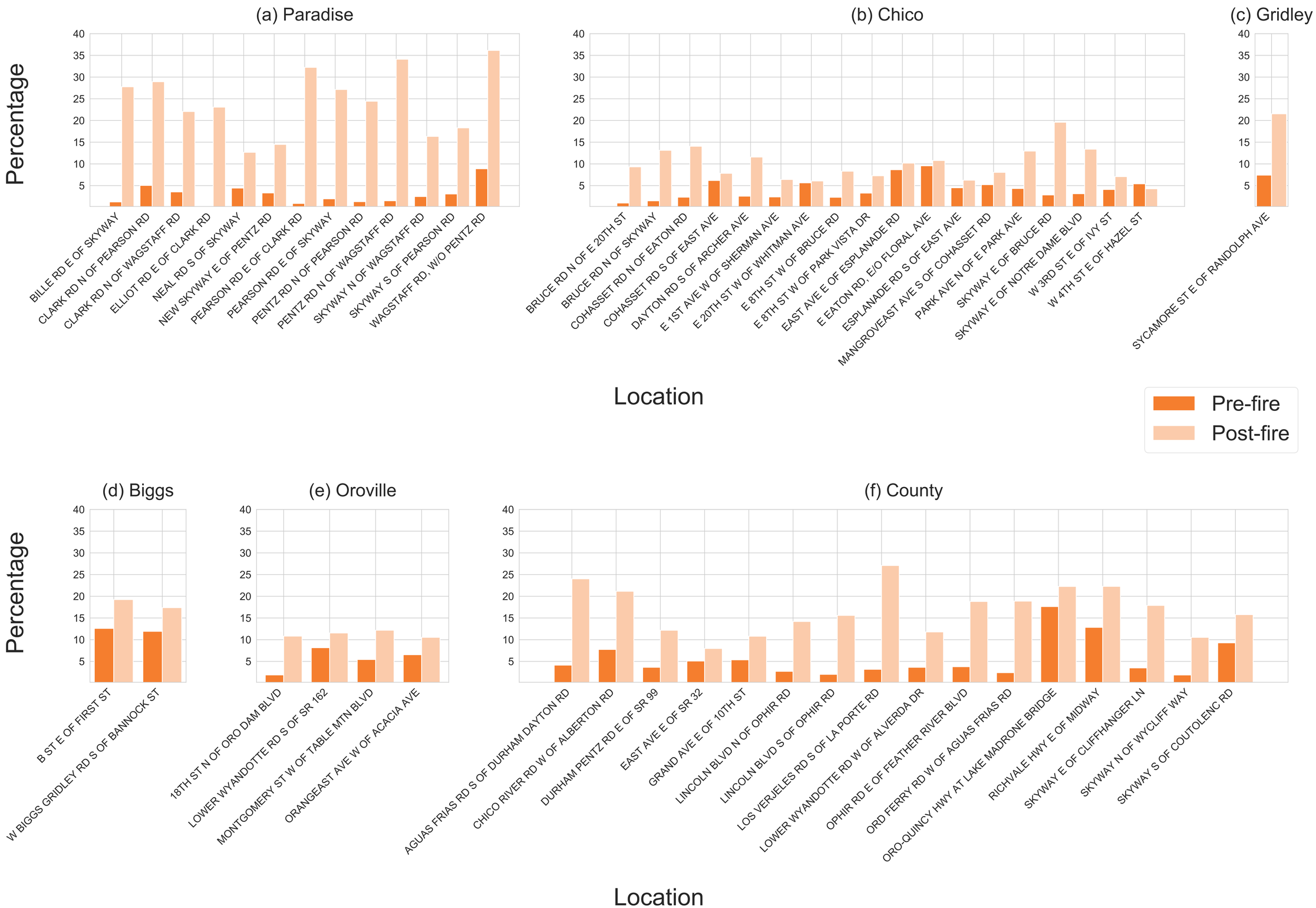


Chart 10: Difference in Average Daily Medium Truck Share by Location

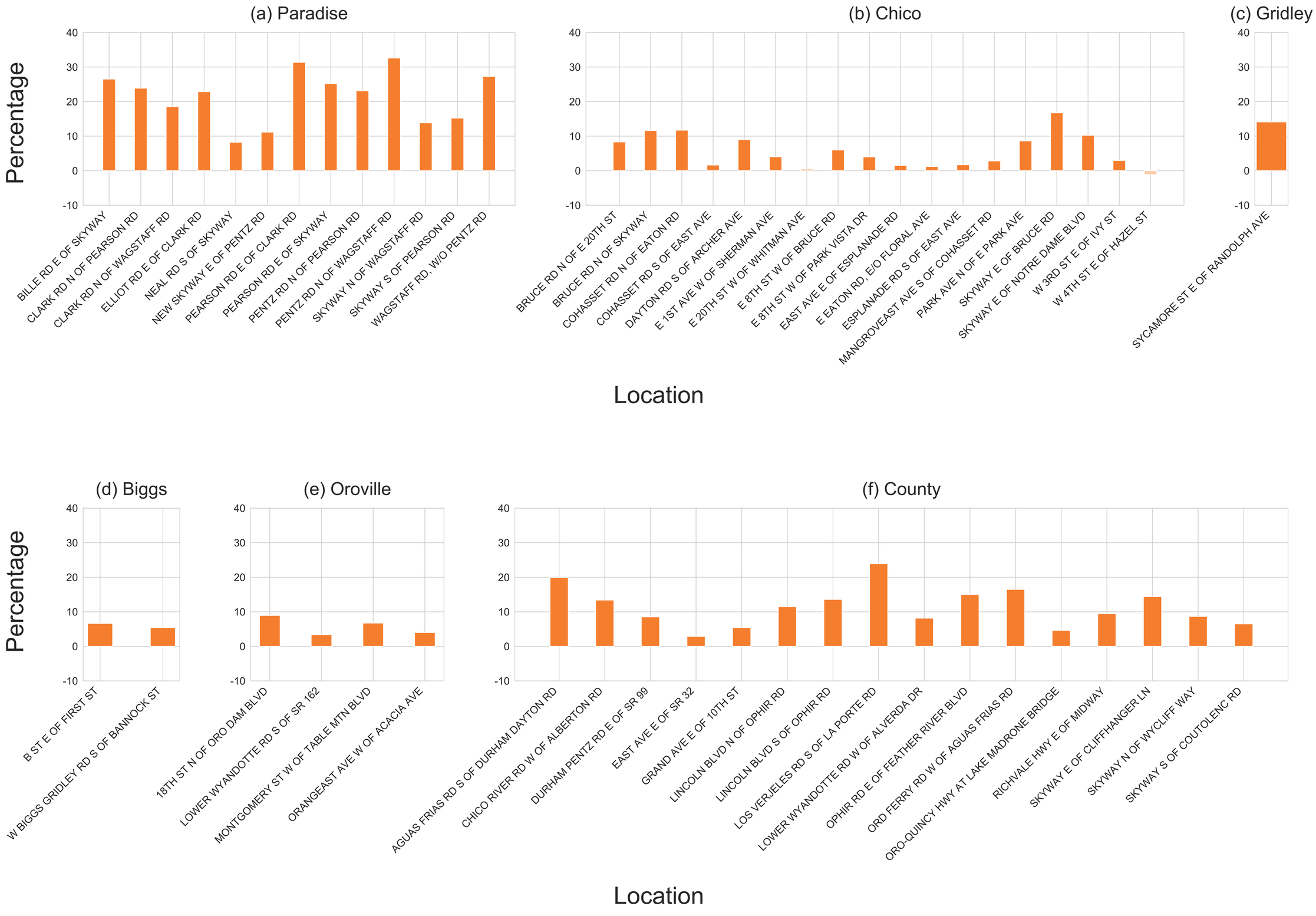


Chart 11: Average Daily Heavy Truck Volume by Location

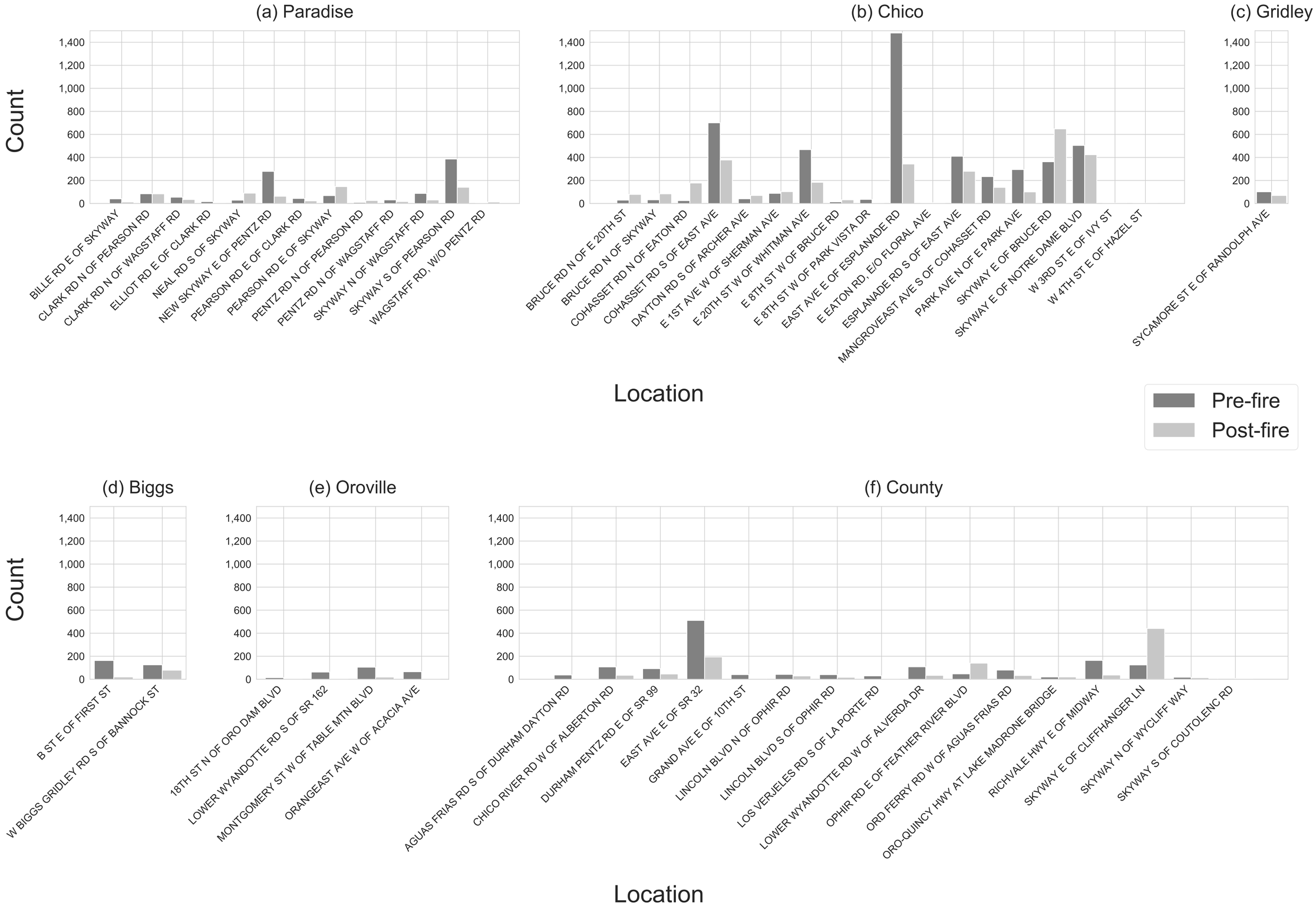


Chart 12: Difference in Average Daily Heavy Truck Volume by Location

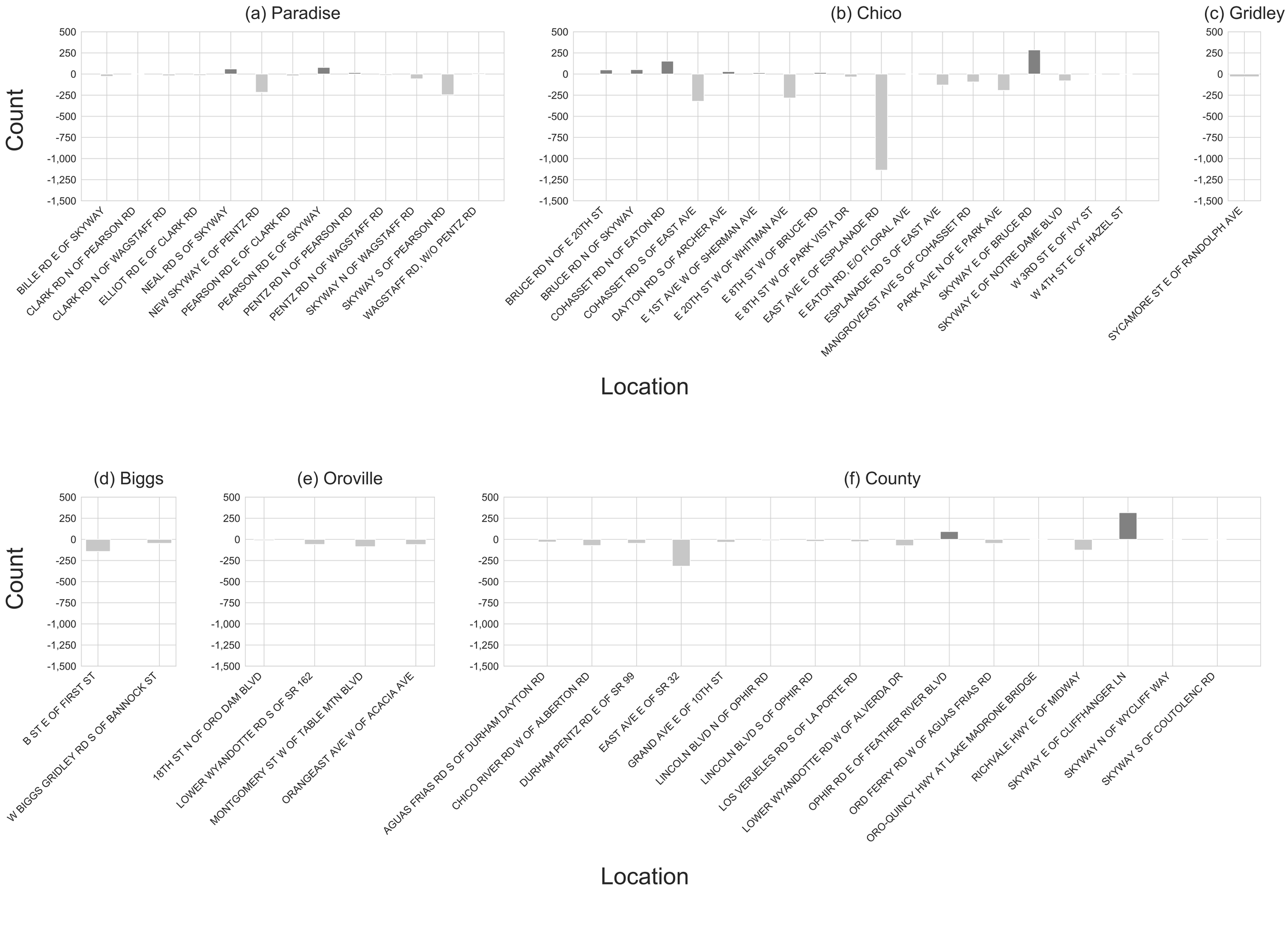


Chart 13: Average Daily Heavy Truck Share by Location

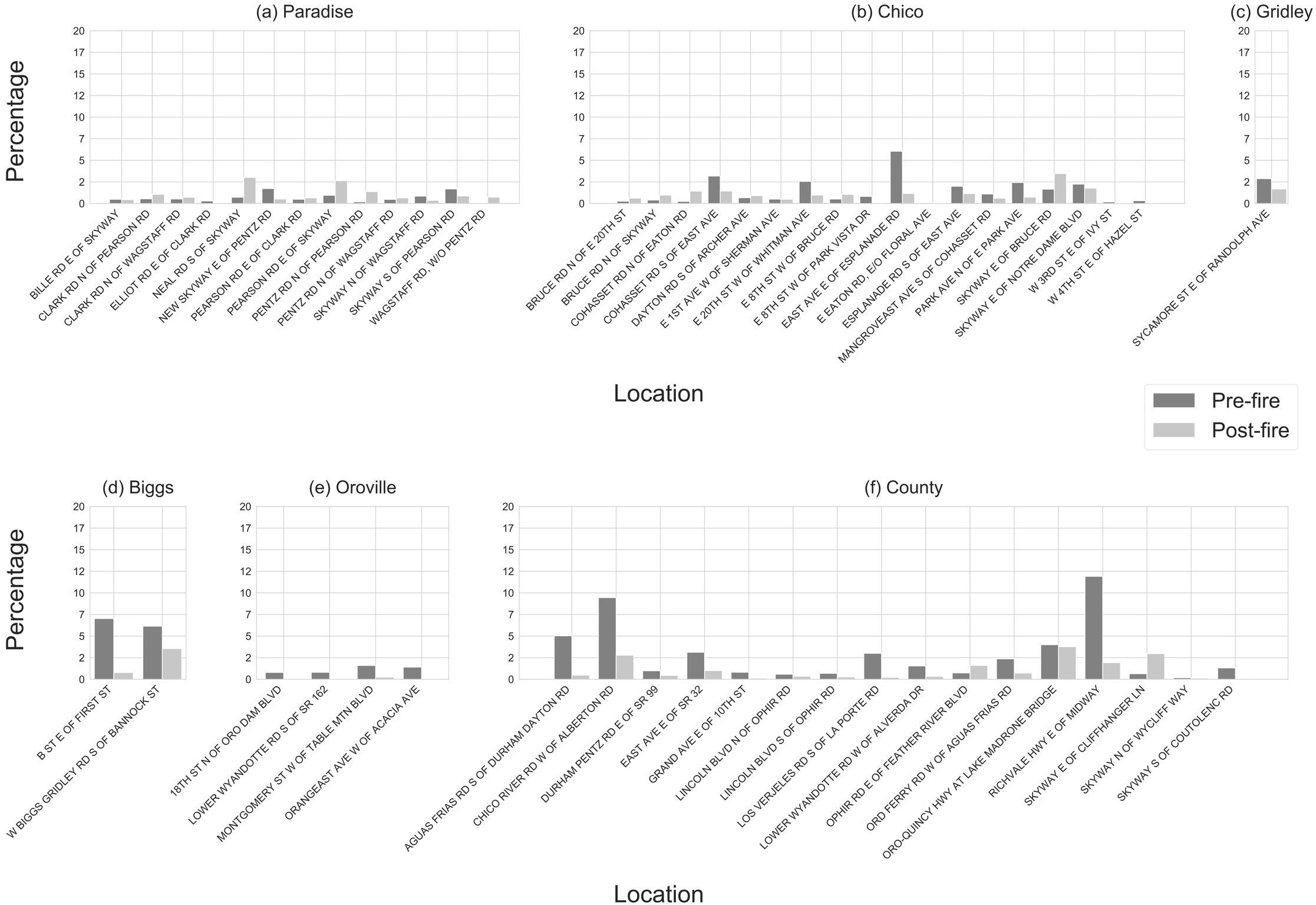


Chart 14: Difference in Average Daily Heavy Truck Share by Location

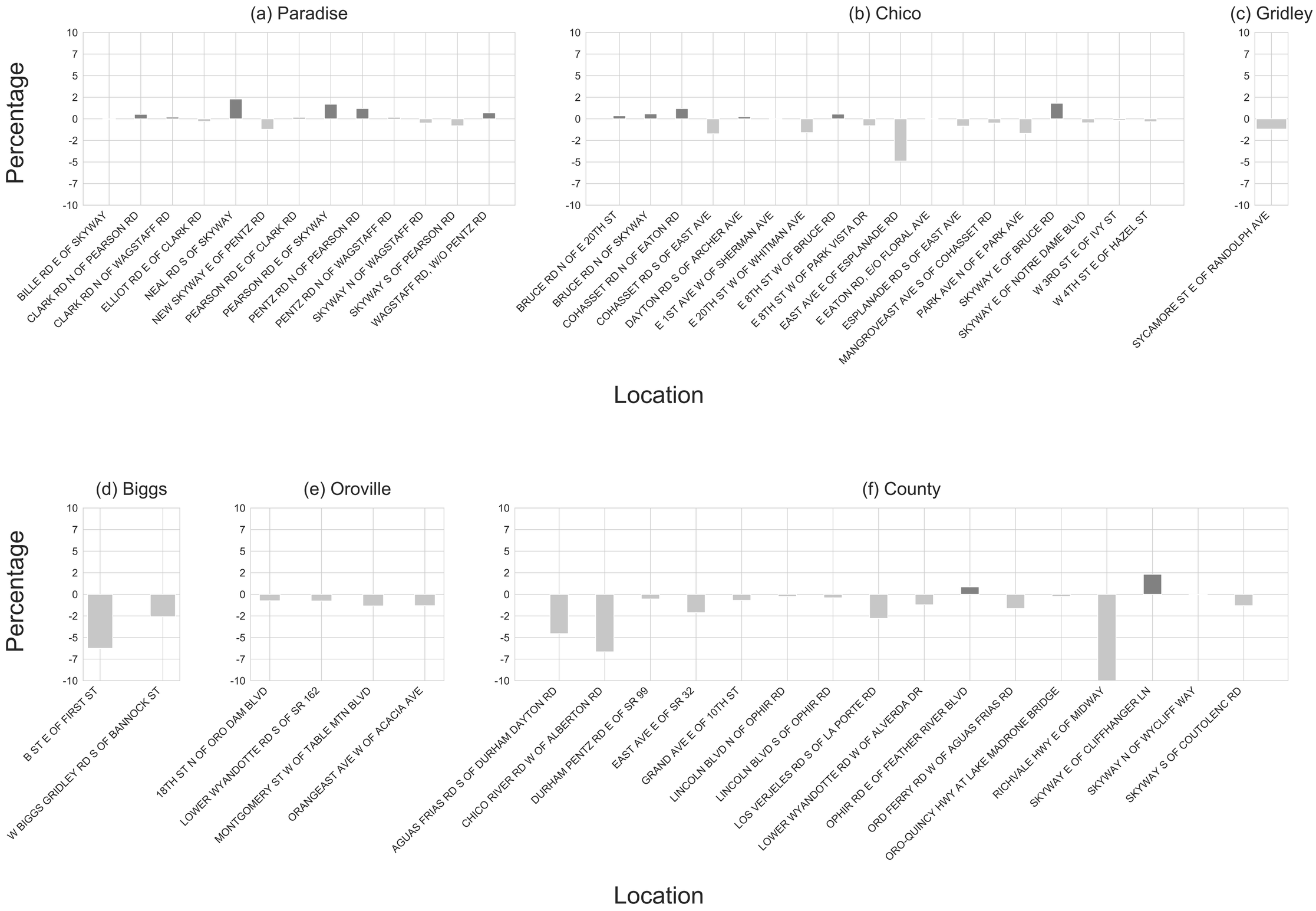


Chart 15: Average Daily Counts for 30 mph or Below Vehicle Speed

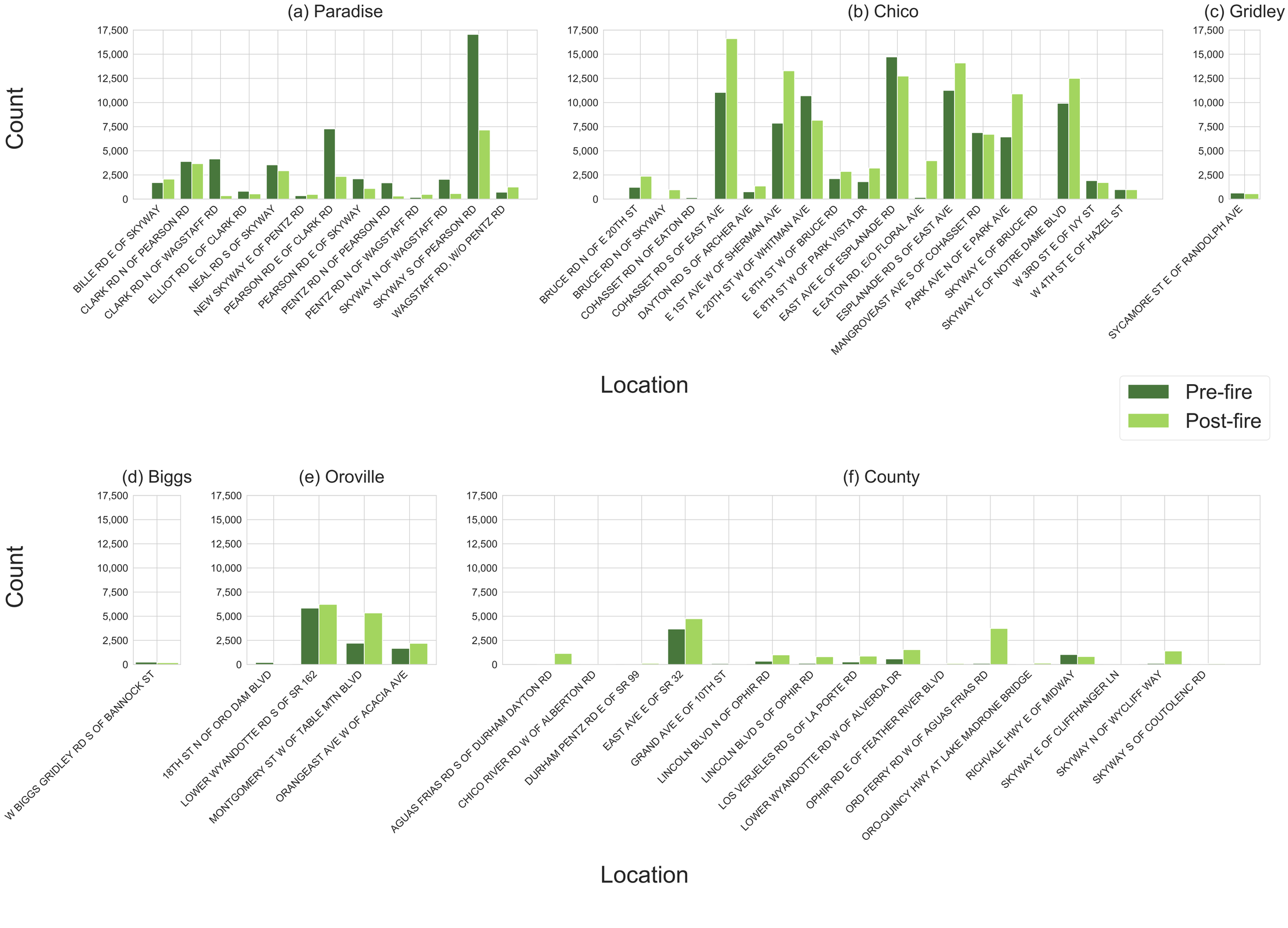


Chart 16: Average Daily Counts for 30-50 mph Vehicle Speed

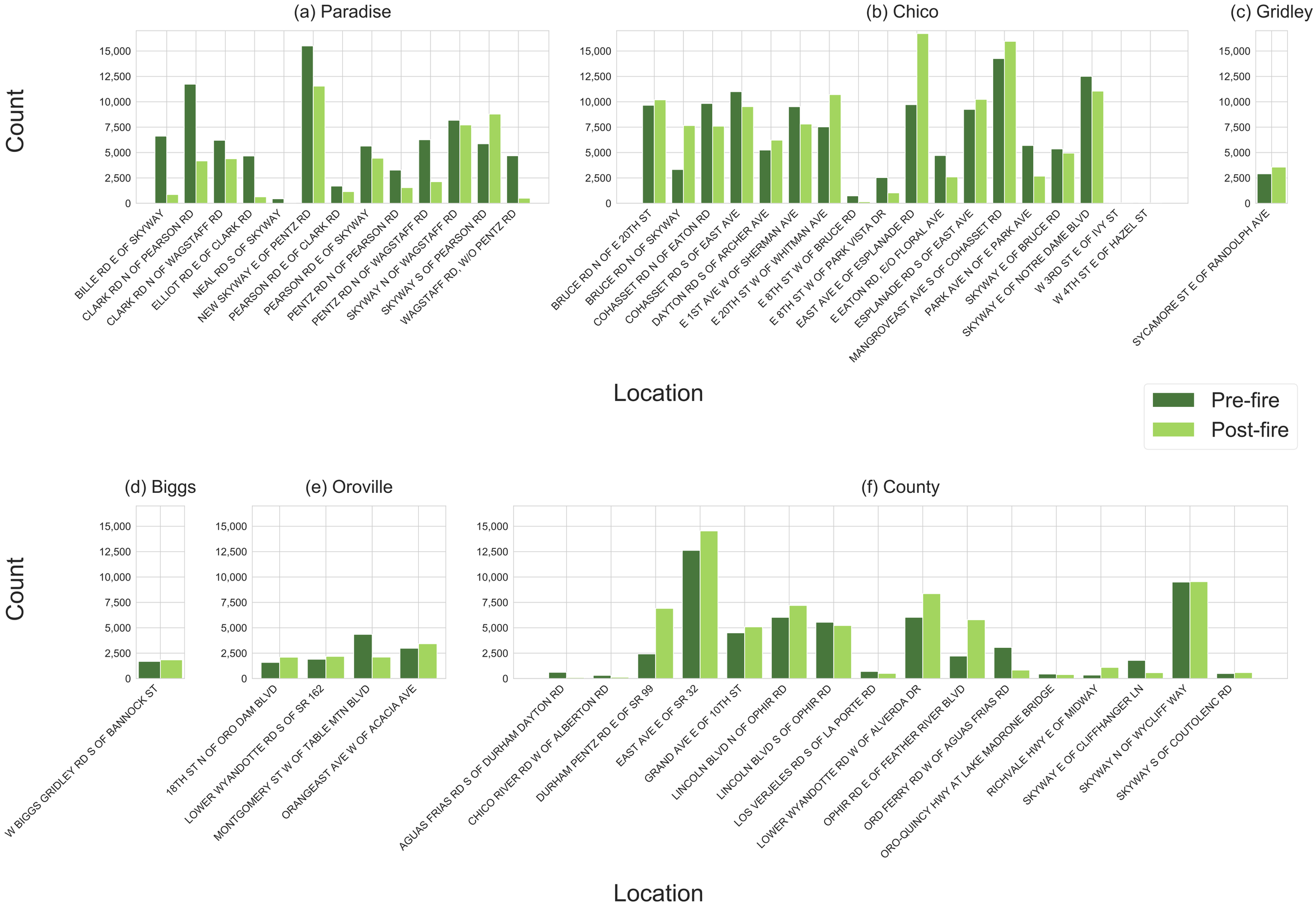


Chart 17: Average Daily Counts for 50 mph or Above Vehicle Speed

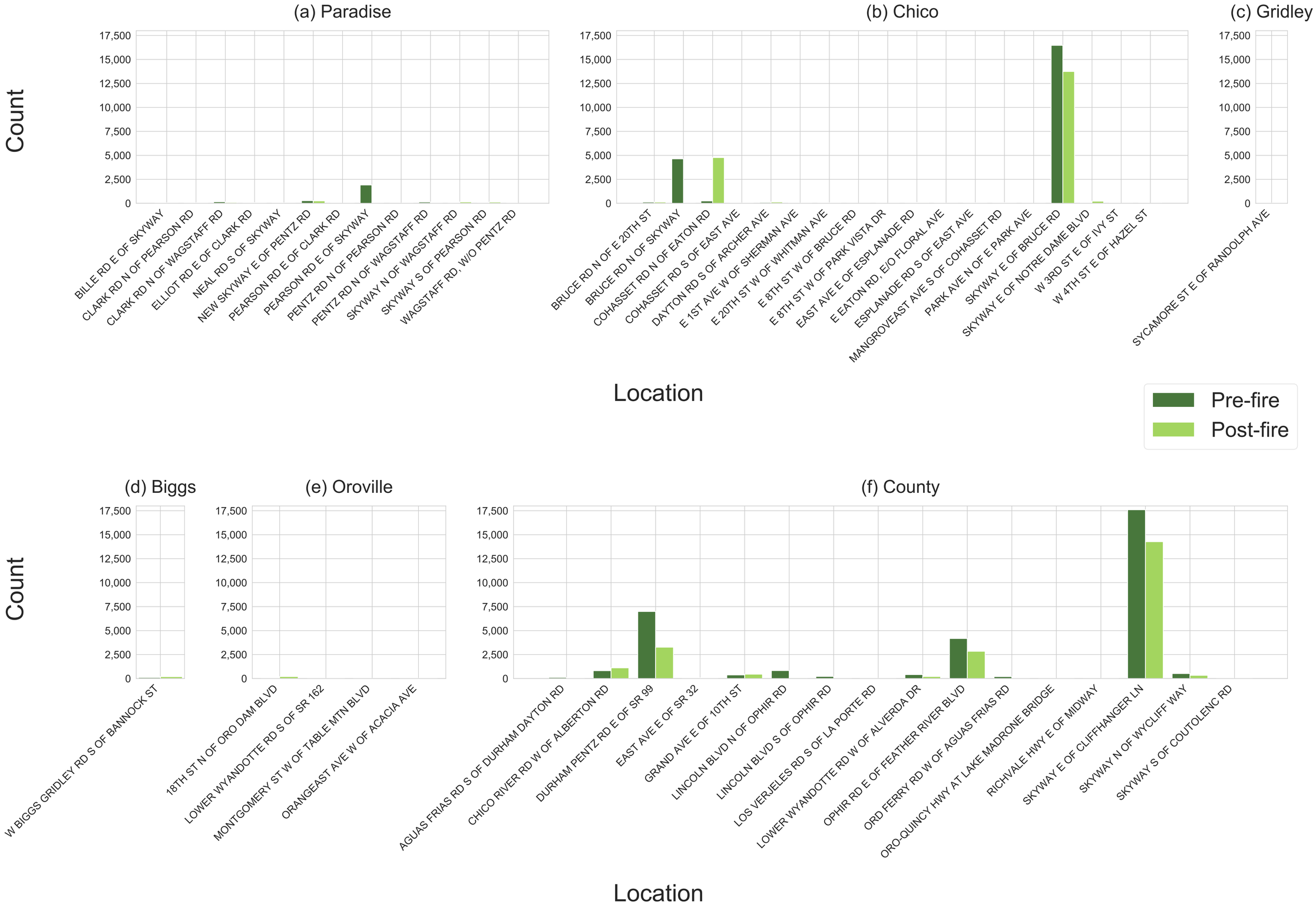


Chart 18: Change in Total Volume and Truck Volume

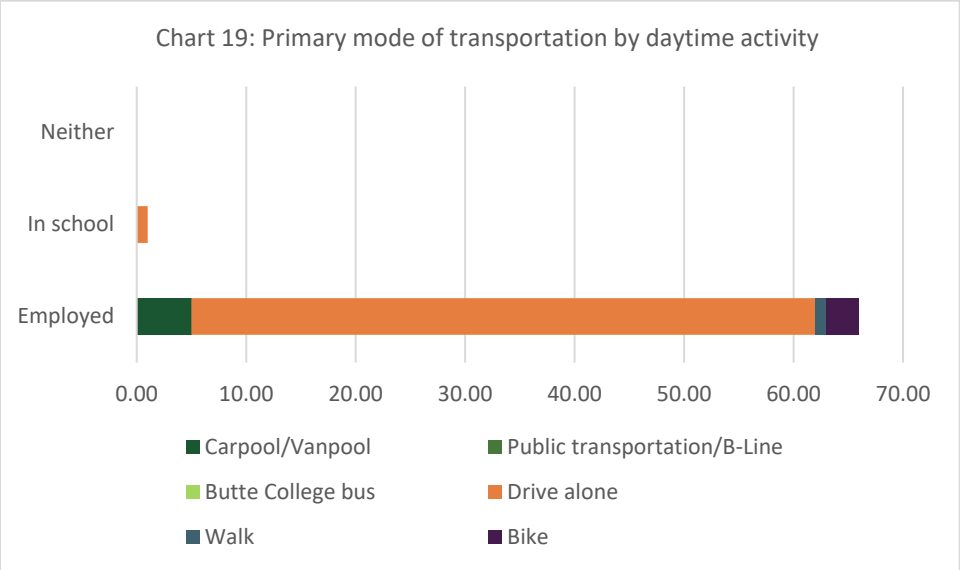


Chart 19: Primary mode of transportation by daytime activity
Neither
In school
Employed
0.00
10.00
20.00
30.00
40.00
50.00
60.00
70.00
Carpool/Vanpool
Public transportation/B-Line
Butte College bus
Drive alone
Walk
Bike

.

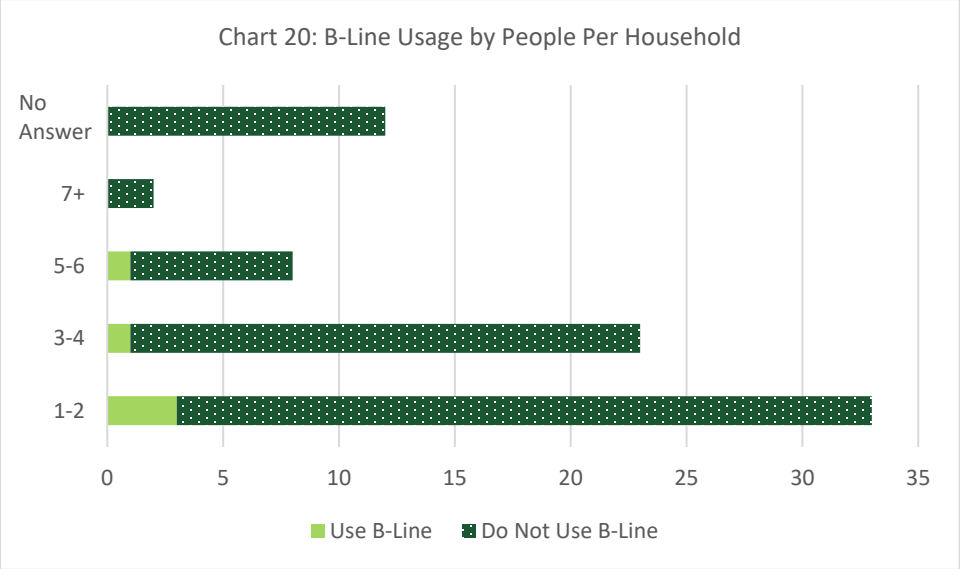


Chart 20: B-Line Usage by People Per Household
No Answer
7+
5-6
3-4
1-2
0
5
10
15
20
25
30
35
Use B-Line
Do Not Use B-Line

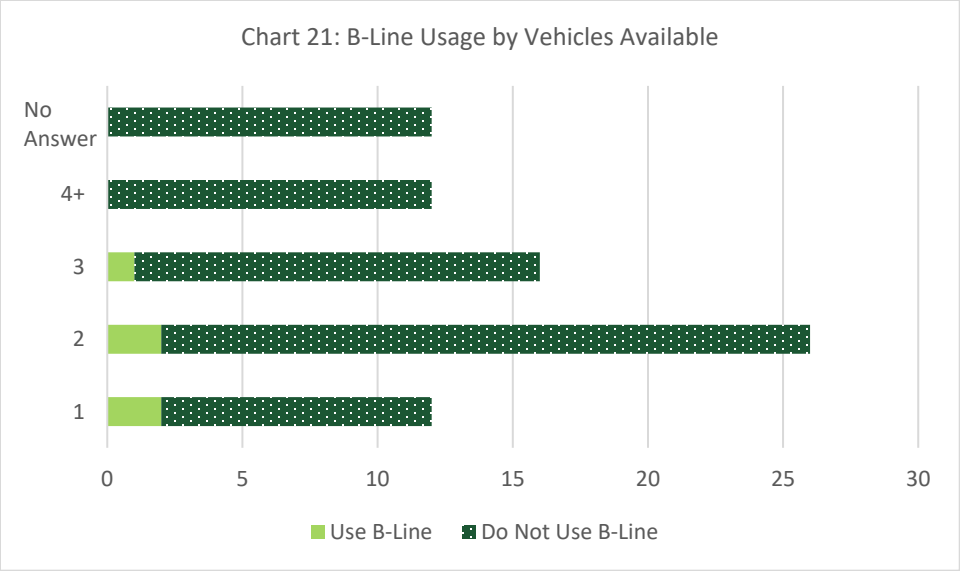


Chart 21: B-Line Usage by Vehicles Available
No Answer
4+
3
2
1
0
5
10
15
20
25
30
Use B-Line
Do Not Use B-Line

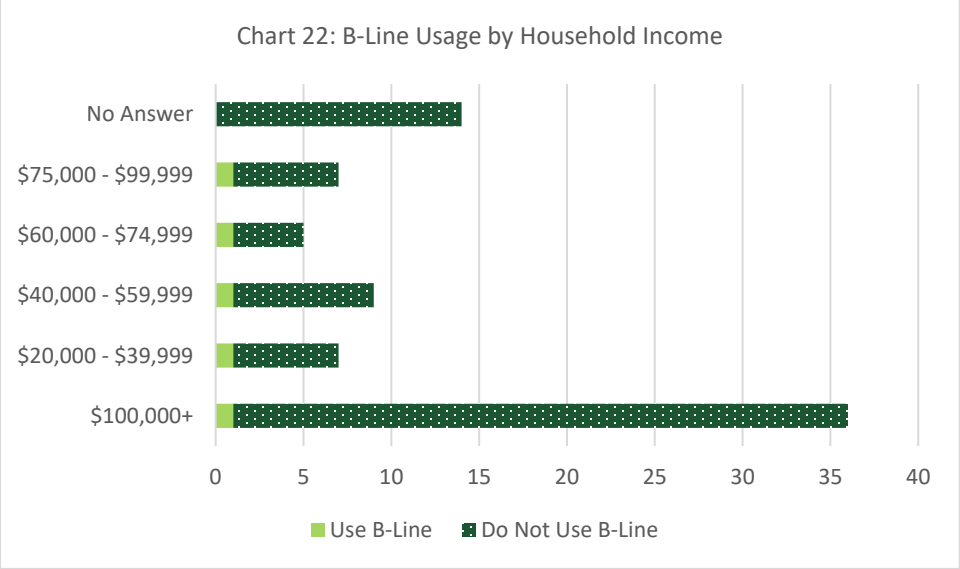


Chart 22: B-Line Usage by Household Income
No Answer
$75,000 - $99,999
$60,000 - $74,999
$40,000 - $59,999
$20,000 - $39,999
$100,000+
0
5
10
15
20
25
30
35
40
Use B-Line
Do Not Use B-Line

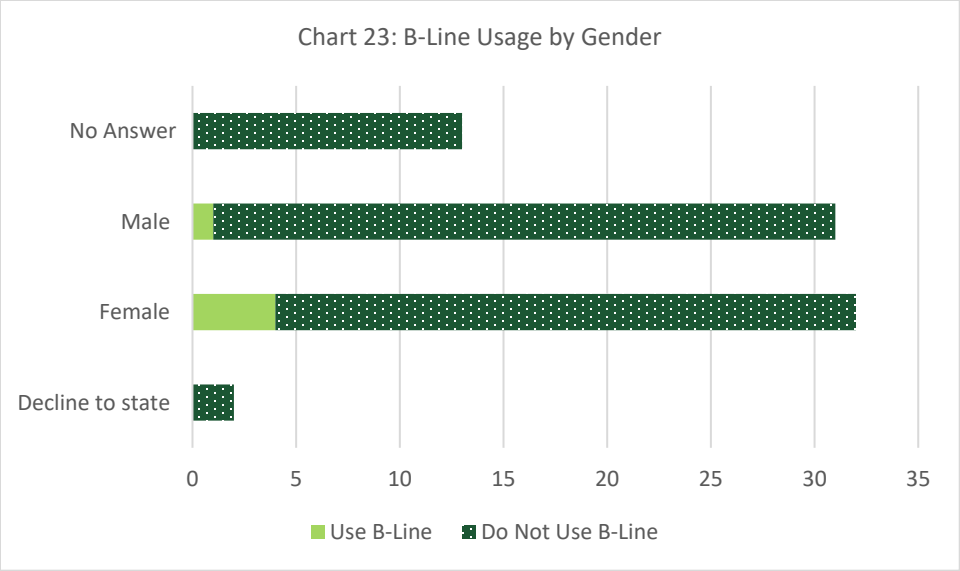


Chart 23: B-Line Usage by Gender
No Answer
Male
Female
Decline to state
0
5
10
15
20
25
30
35
Use B-Line
Do Not Use B-Line

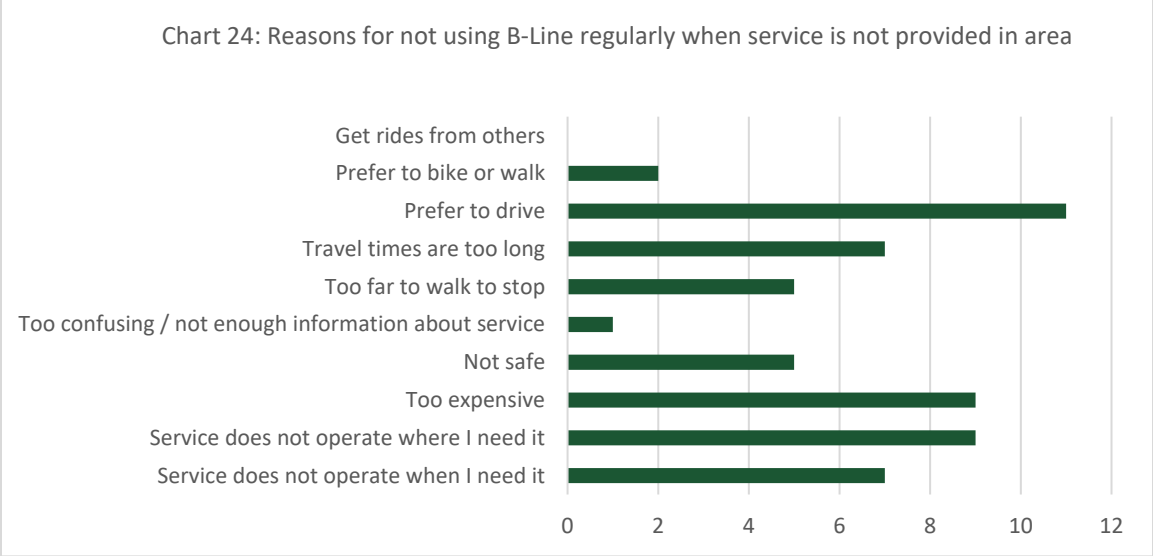


Chart 24: Reasons for not using B-Line regularly when service is not provided in area
Get rides from others
Prefer to bike or walk
Prefer to drive
Travel times are too long
Too far to walk to stop
Too confusing / not enough information about service
Not safe
Too expensive
Service does not operate where I need it
Service does not operate when I need it
0
2
4
6
8
10
12

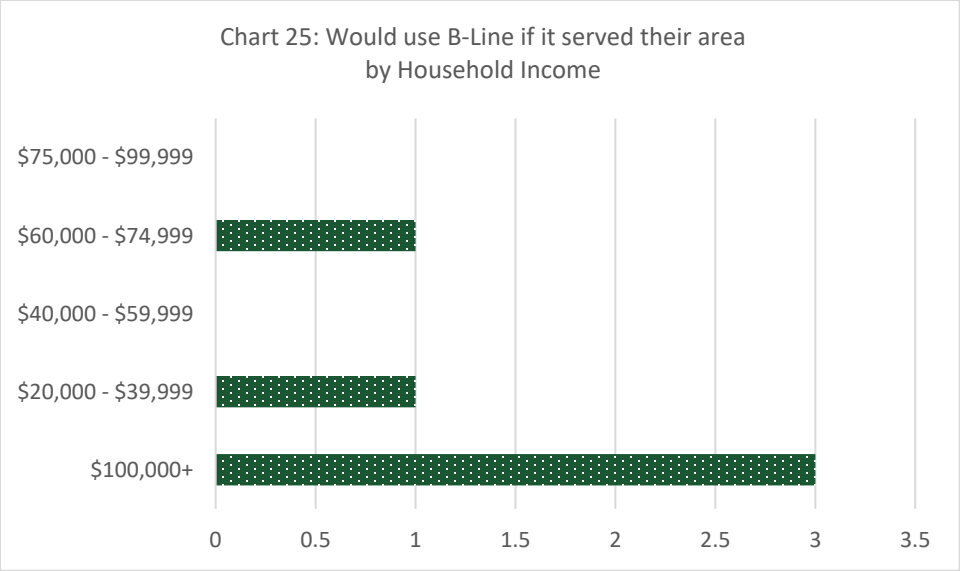


Chart 25: Would use B-Line if it served their area by Household Income
$75,000 - $99,999
$60,000 - $74,999
$40,000 - $59,999
$20,000 - $39,999
$100,000+
0
0.5
1
1.5
2
2.5
3
3.5

Chart 26: Total Weekday Trips Starting or Ending in Butte County

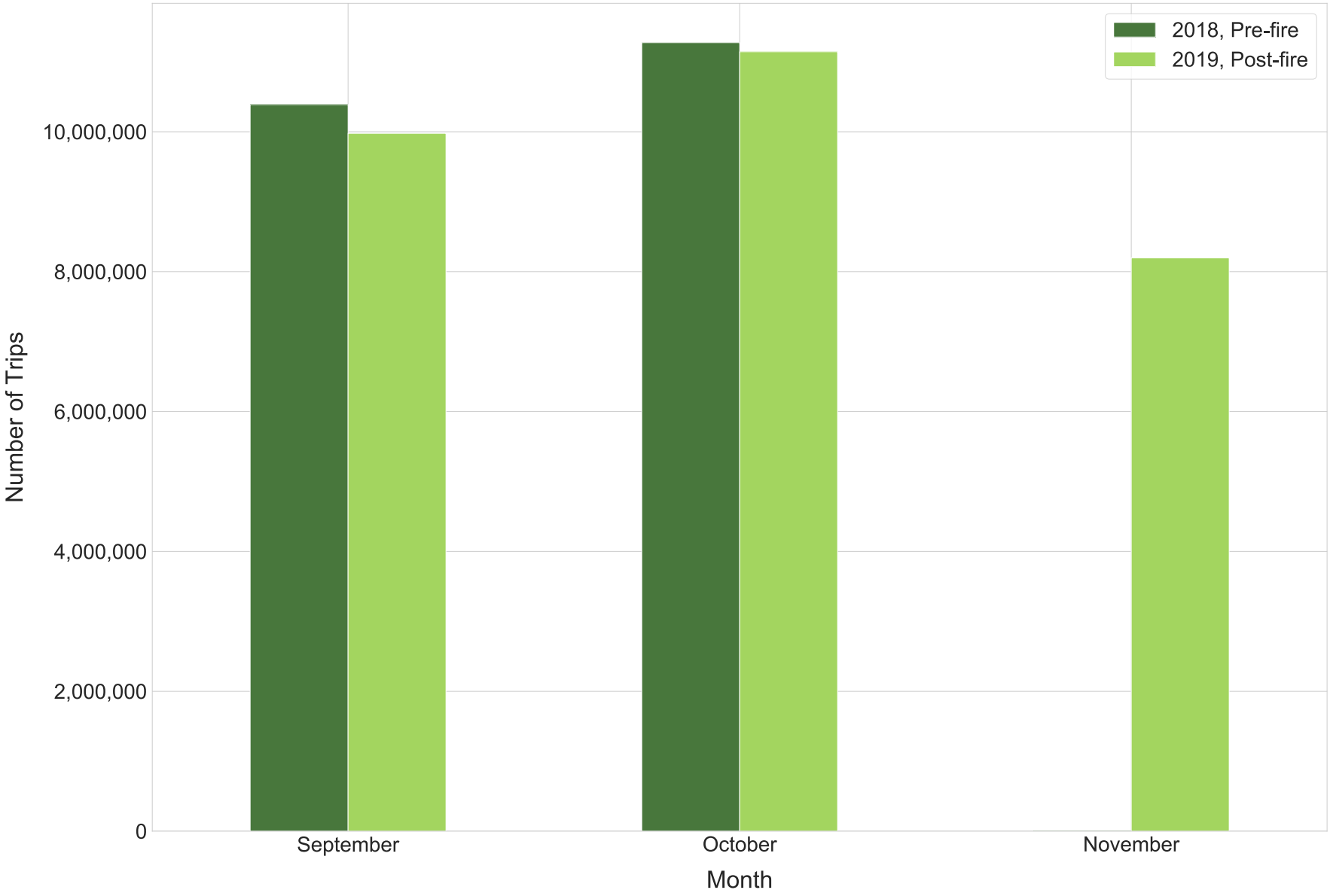


Chart 27: Total Weekend Trips Starting or Ending in Butte County

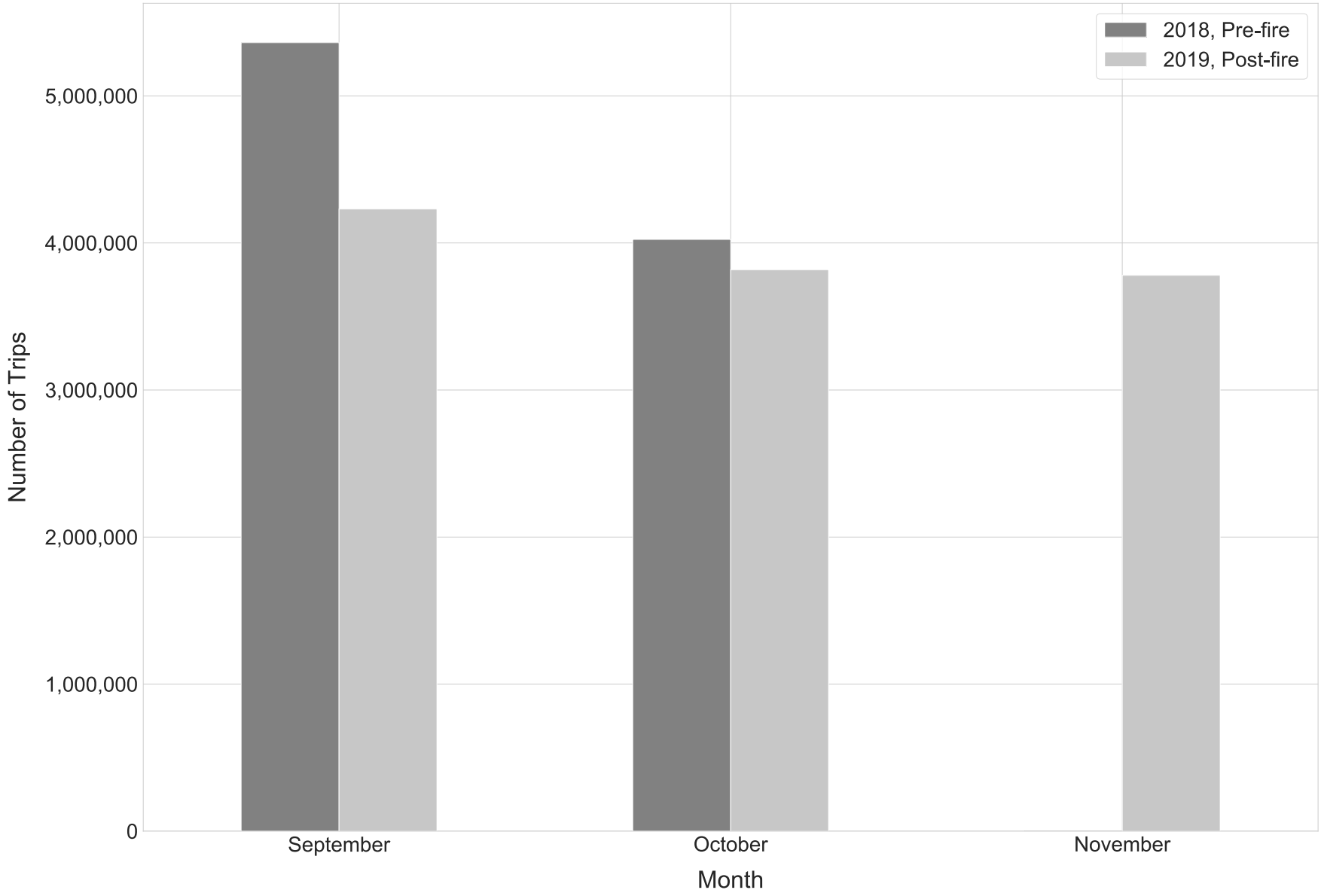


Chart 28: Change in Weekday Trips Starting or Ending in Butte County

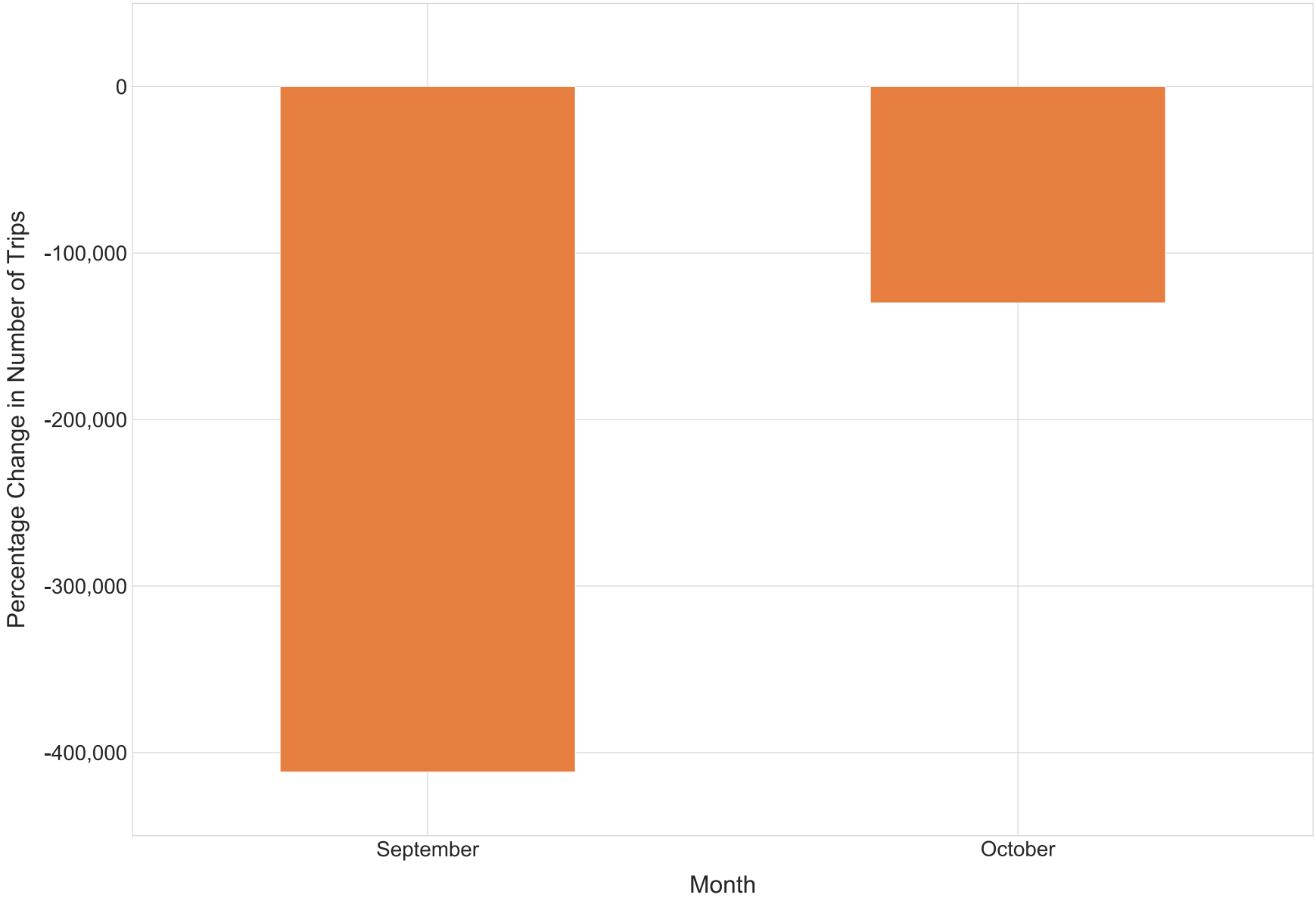


Chart 29: Change in Weekend Trips Starting or Ending in Butte County

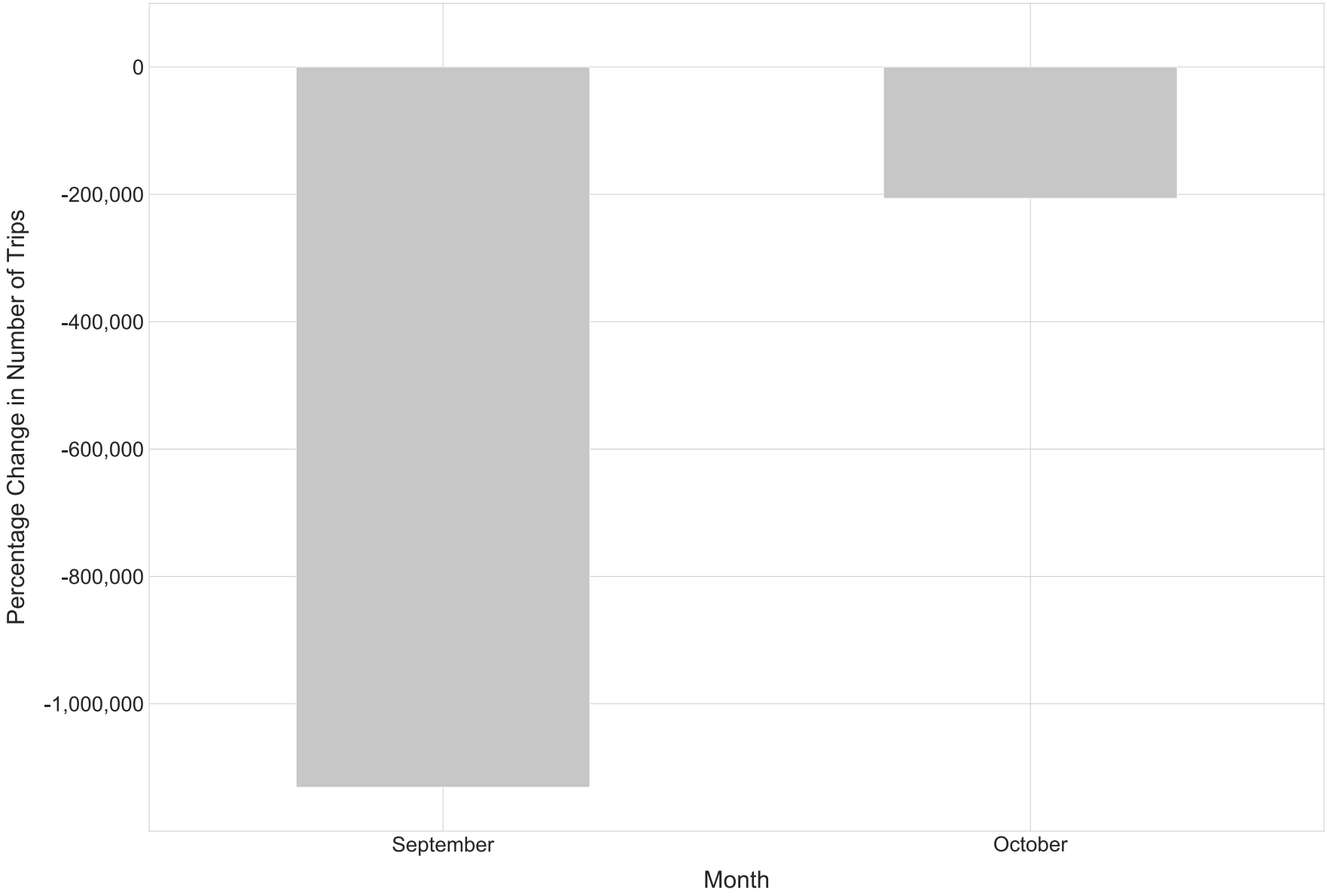


Chart 30: Weekday Trips Entering Butte County

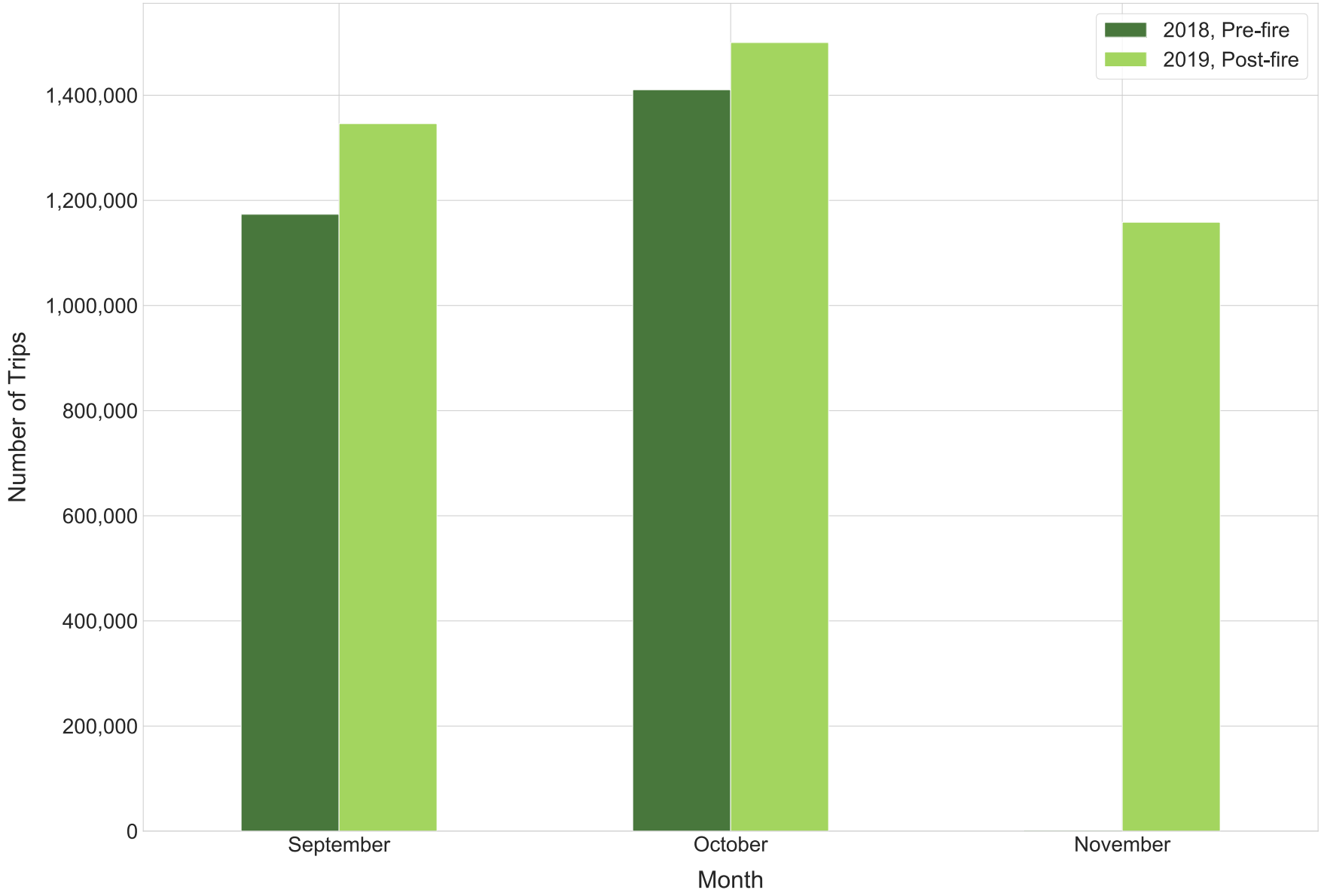


Chart 31: Weekend Trips Entering Butte County

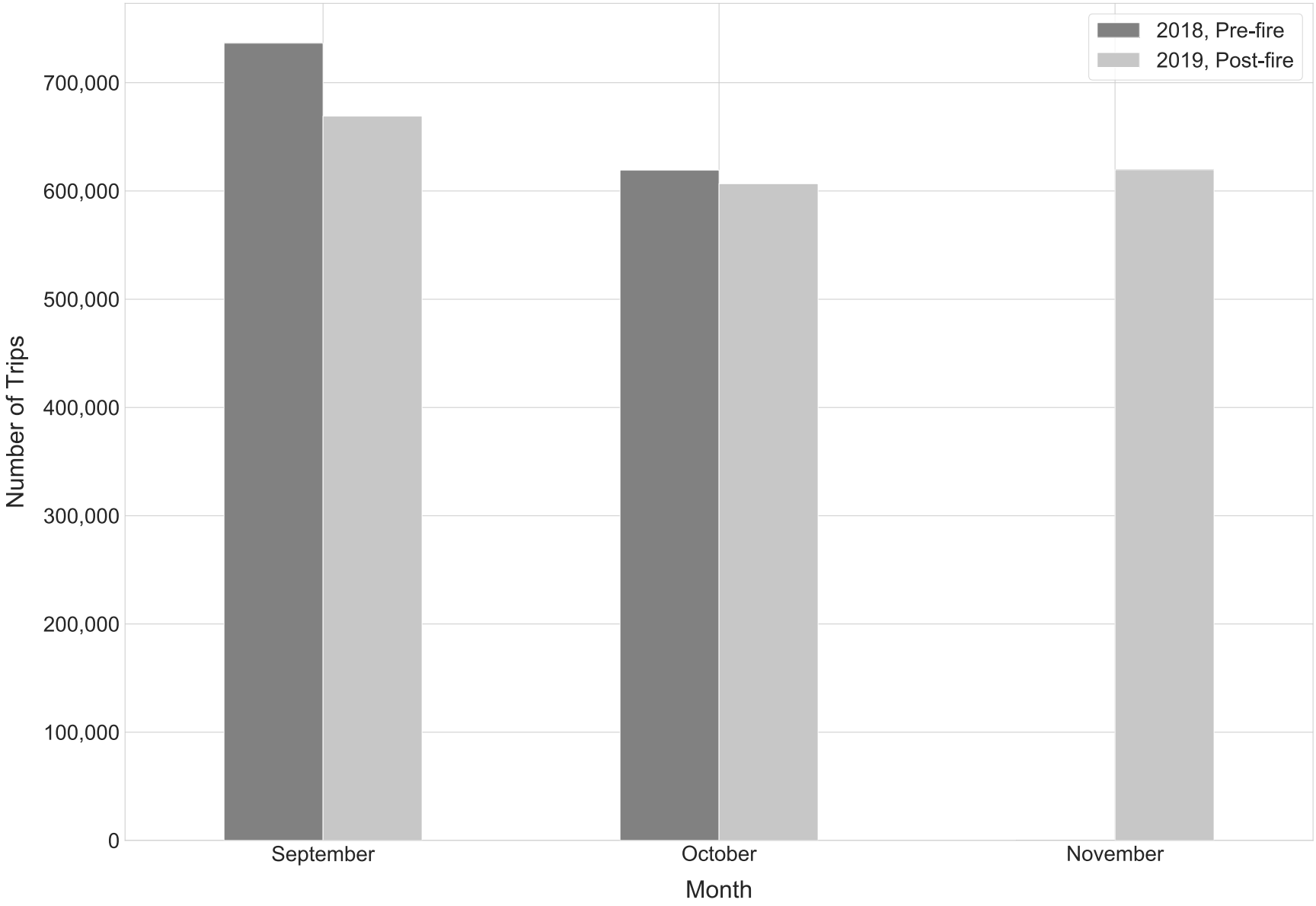


Chart 32: Change in Weekday Trips Entering Butte County

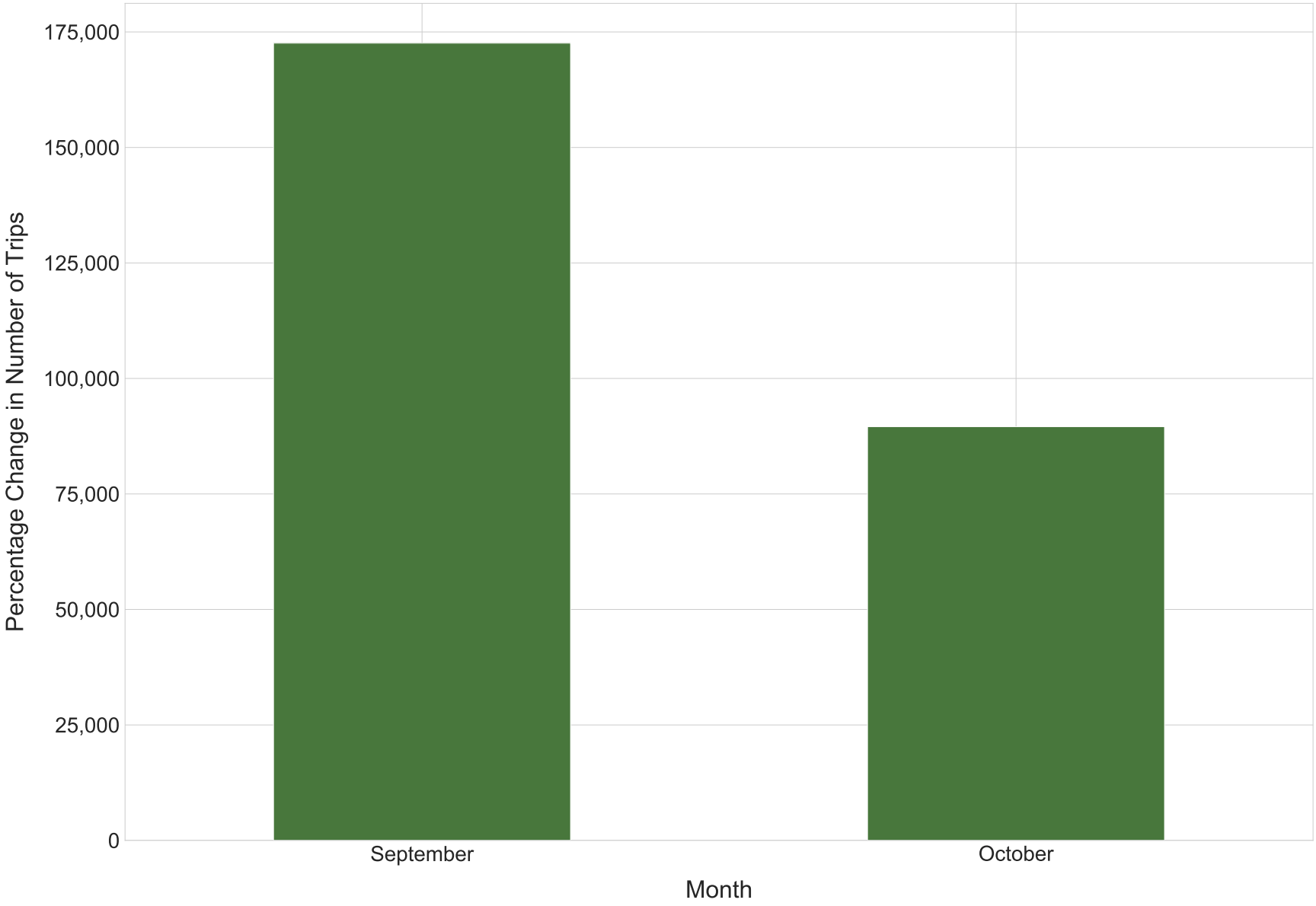


Chart 33: Change in Weekend Trips Entering Butte County

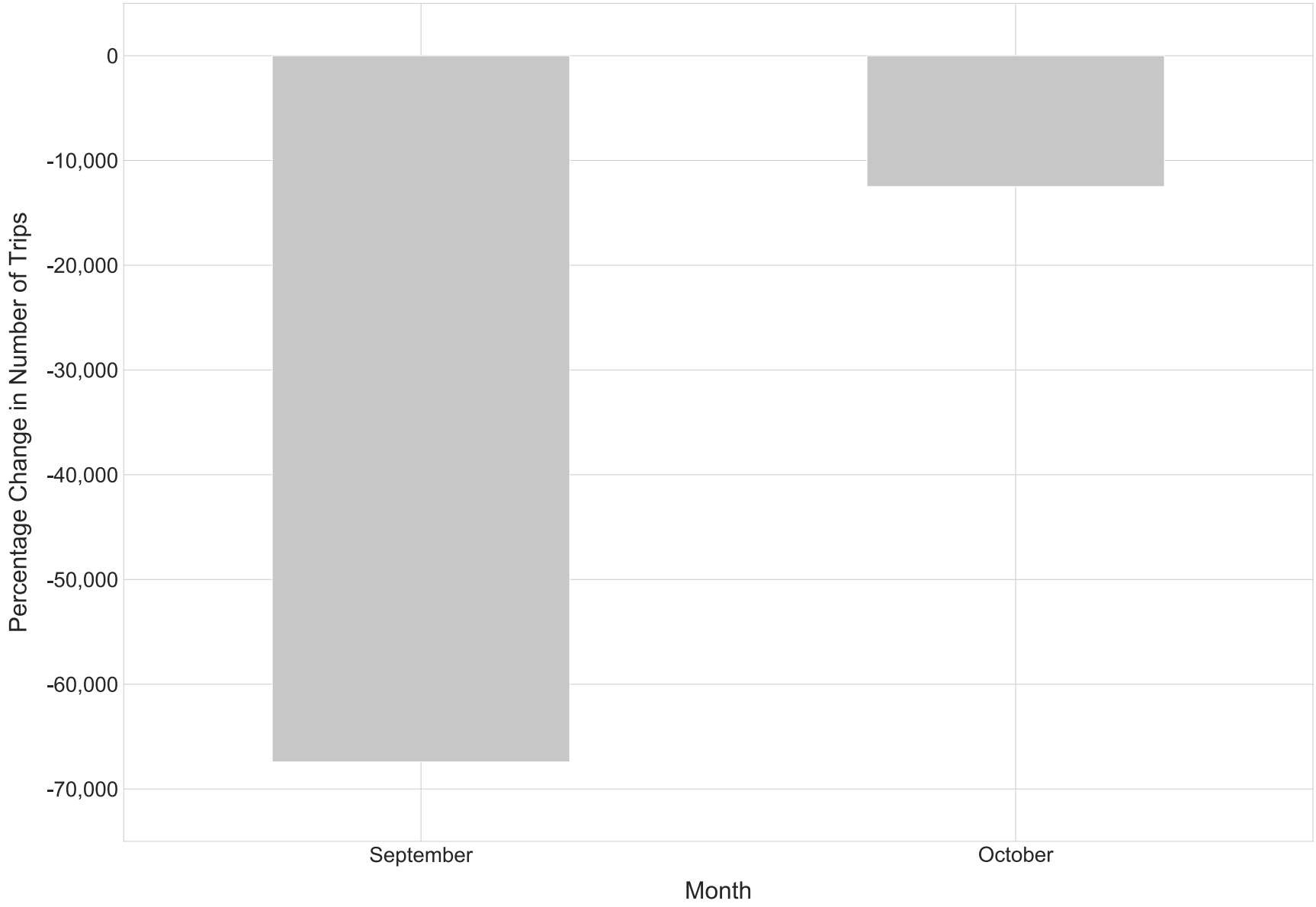


Chart 34: Change in Weekday Trips Entering Butte County by County of Origin – September

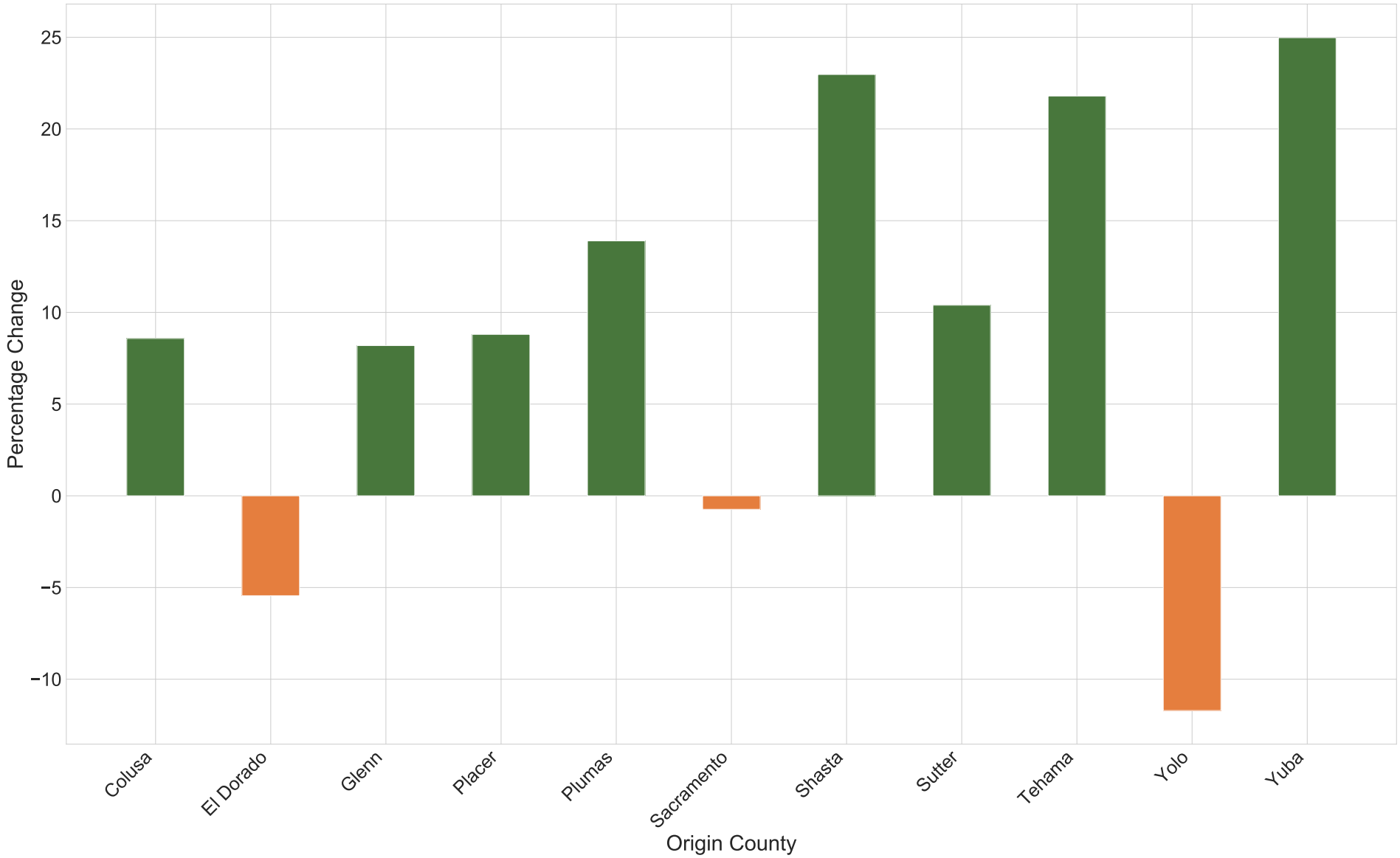


Chart 35: Change in Weekday Trips Entering Butte County by County of Origin – October

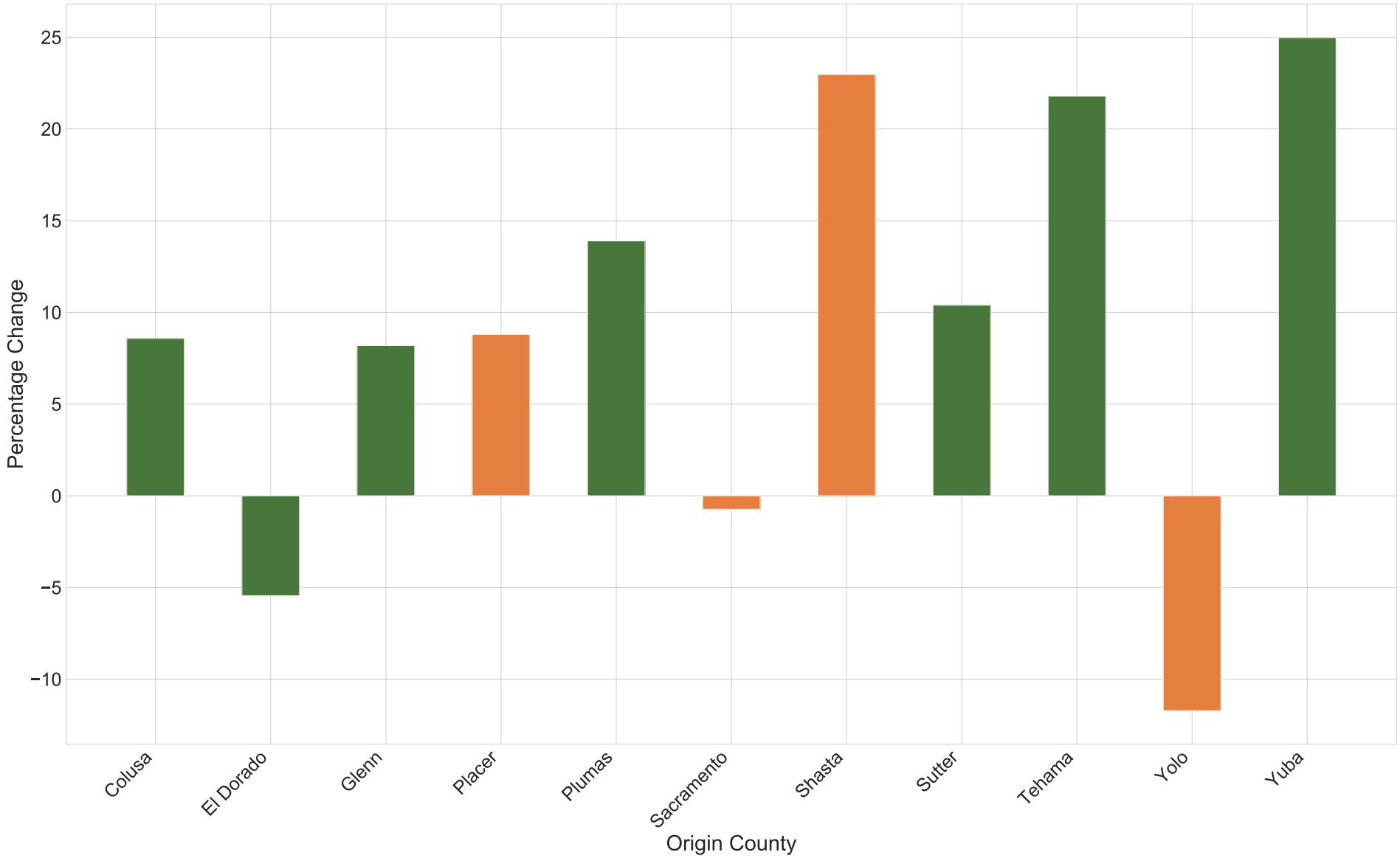


Chart 36.1: Change in Weekend Trips Entering Butte County by County of Origin – September

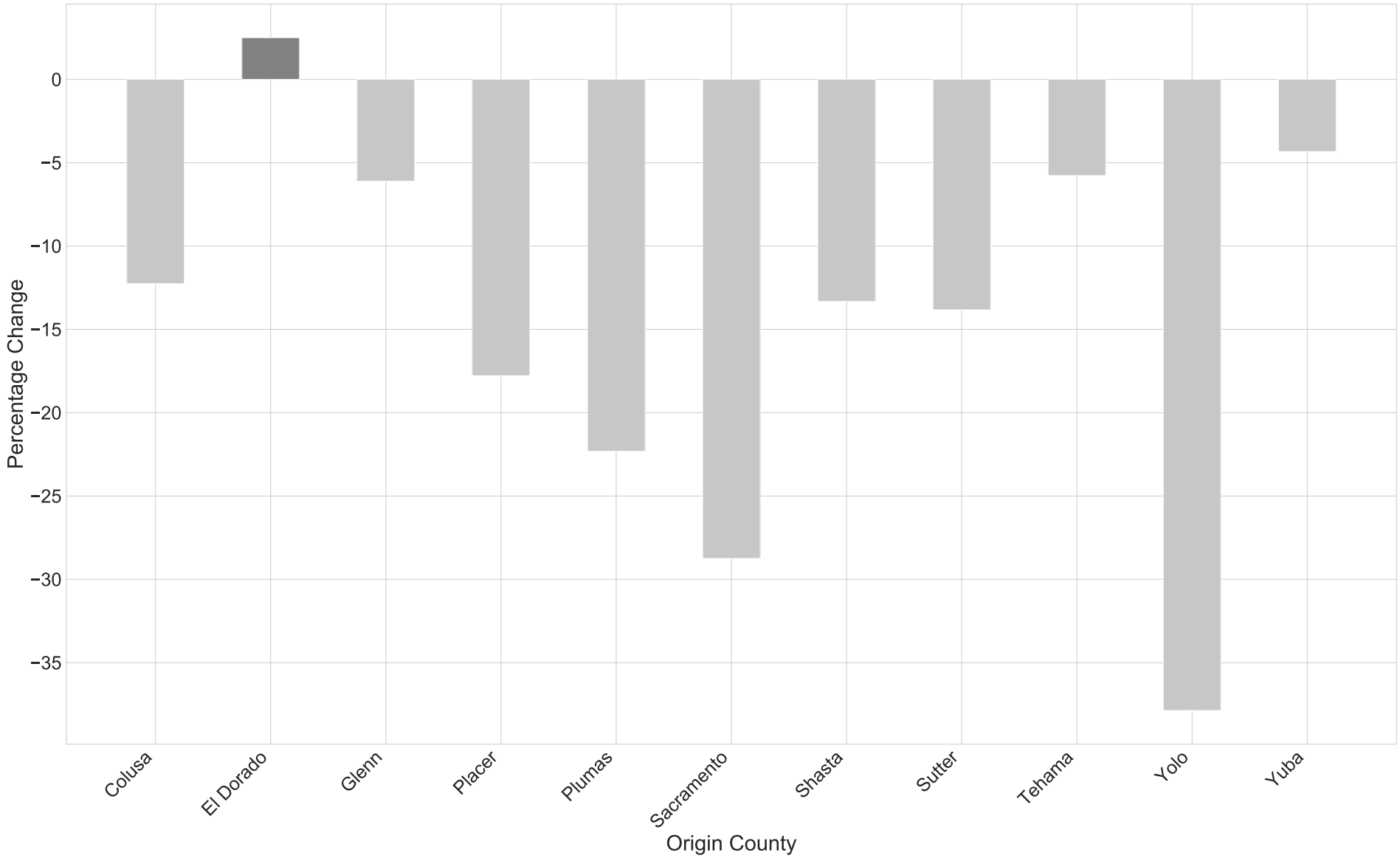


Chart 36.2: Change in Weekend Trips Entering Butte County by County of Origin – October

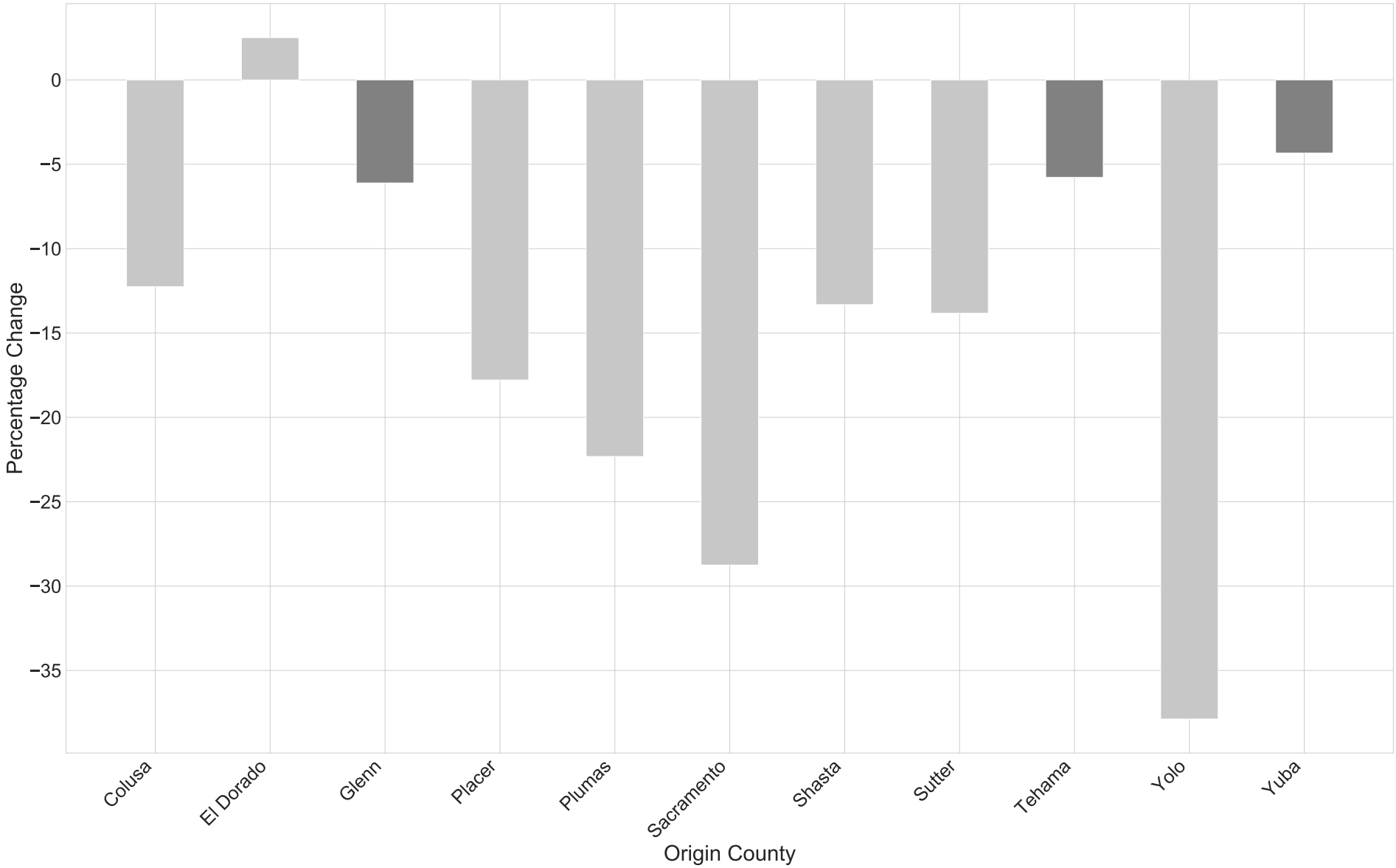


Chart 37: Weekday Trips Exiting Butte County

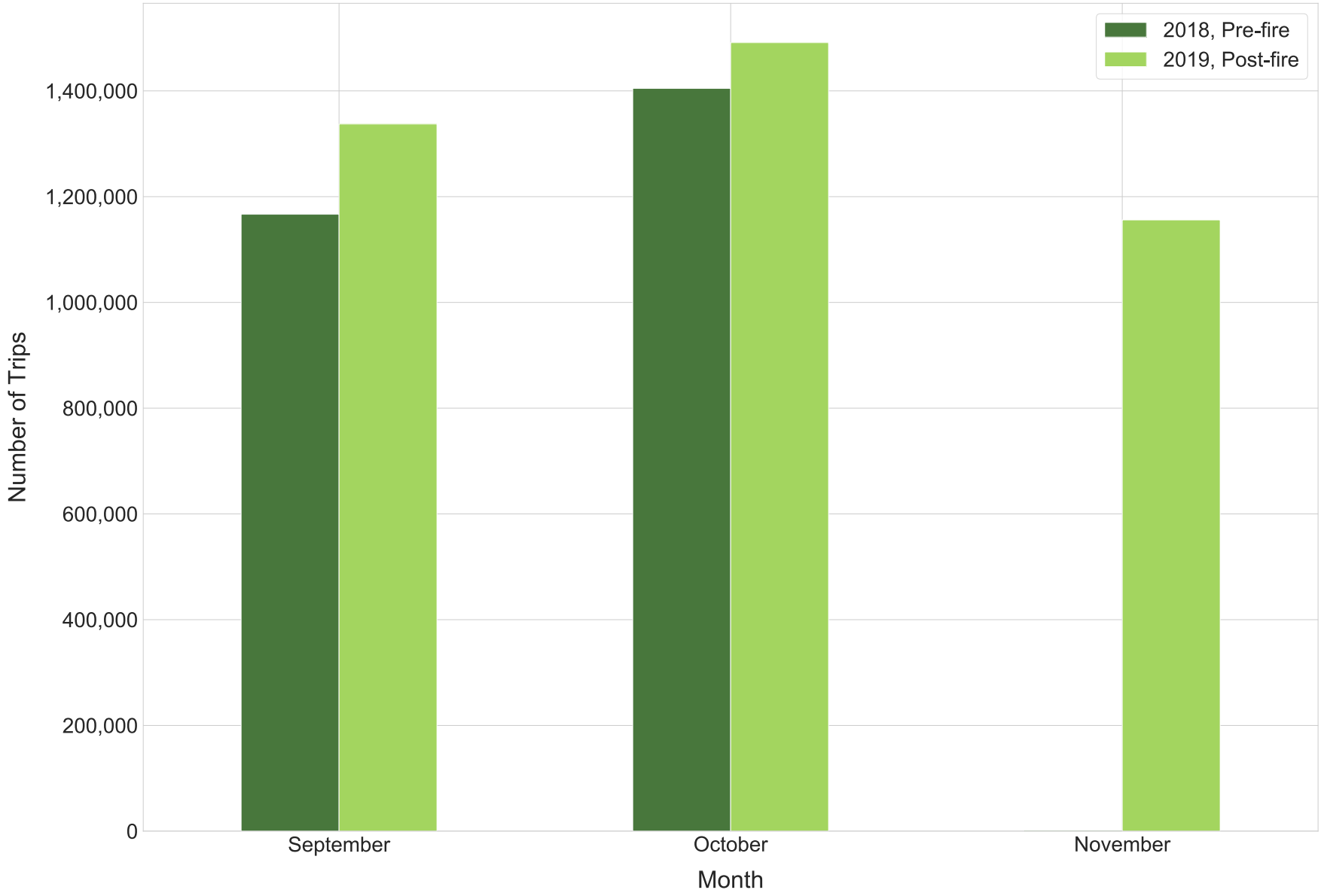


Chart 38: Weekend Trips Exiting Butte County

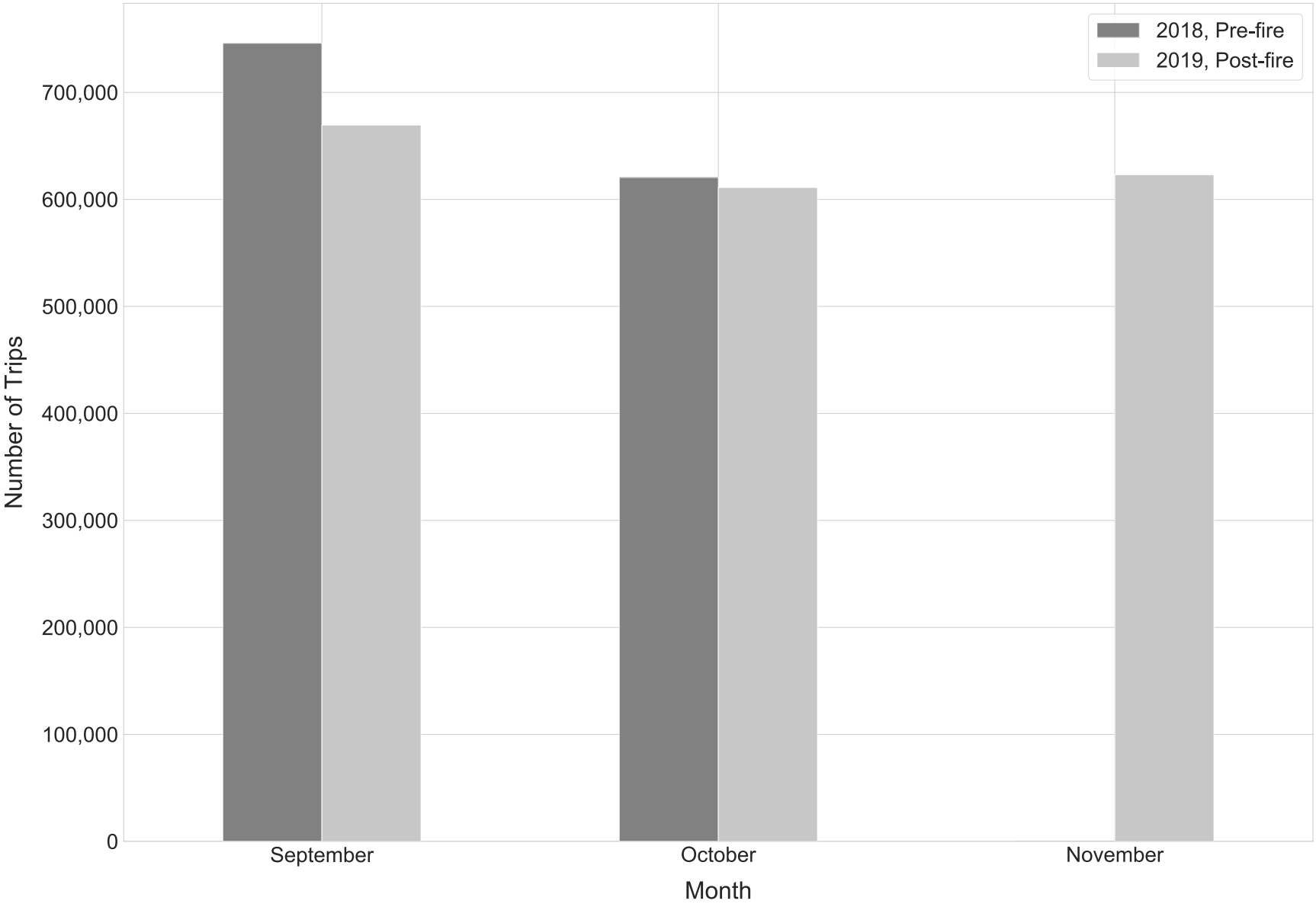


Chart 39: Change in Weekday Trips Exiting Butte County

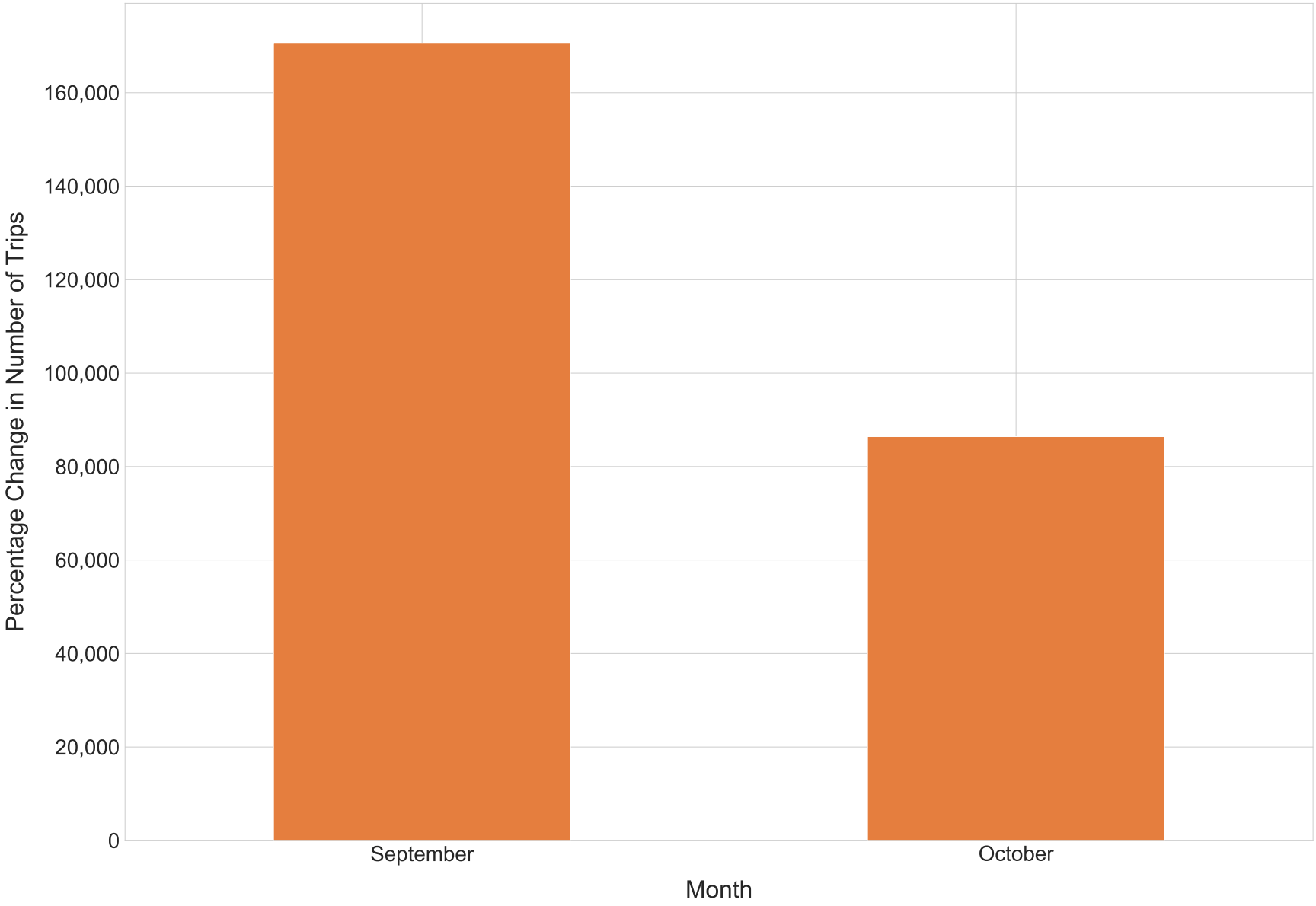


Chart 40: Change in Weekend Trips Exiting Butte County

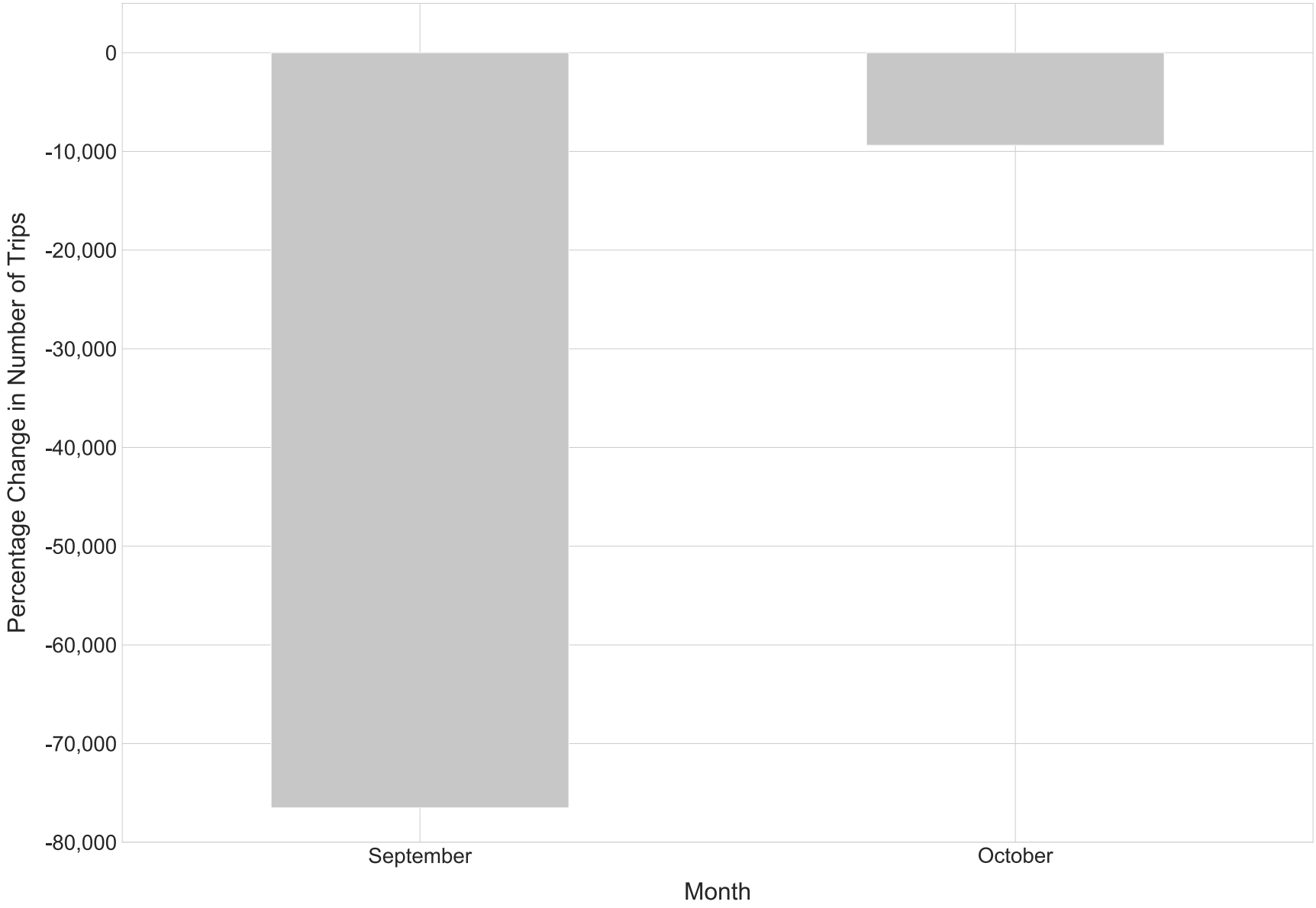


Chart 41: Change in Weekday Trips Exiting Butte County by County of Destination – September

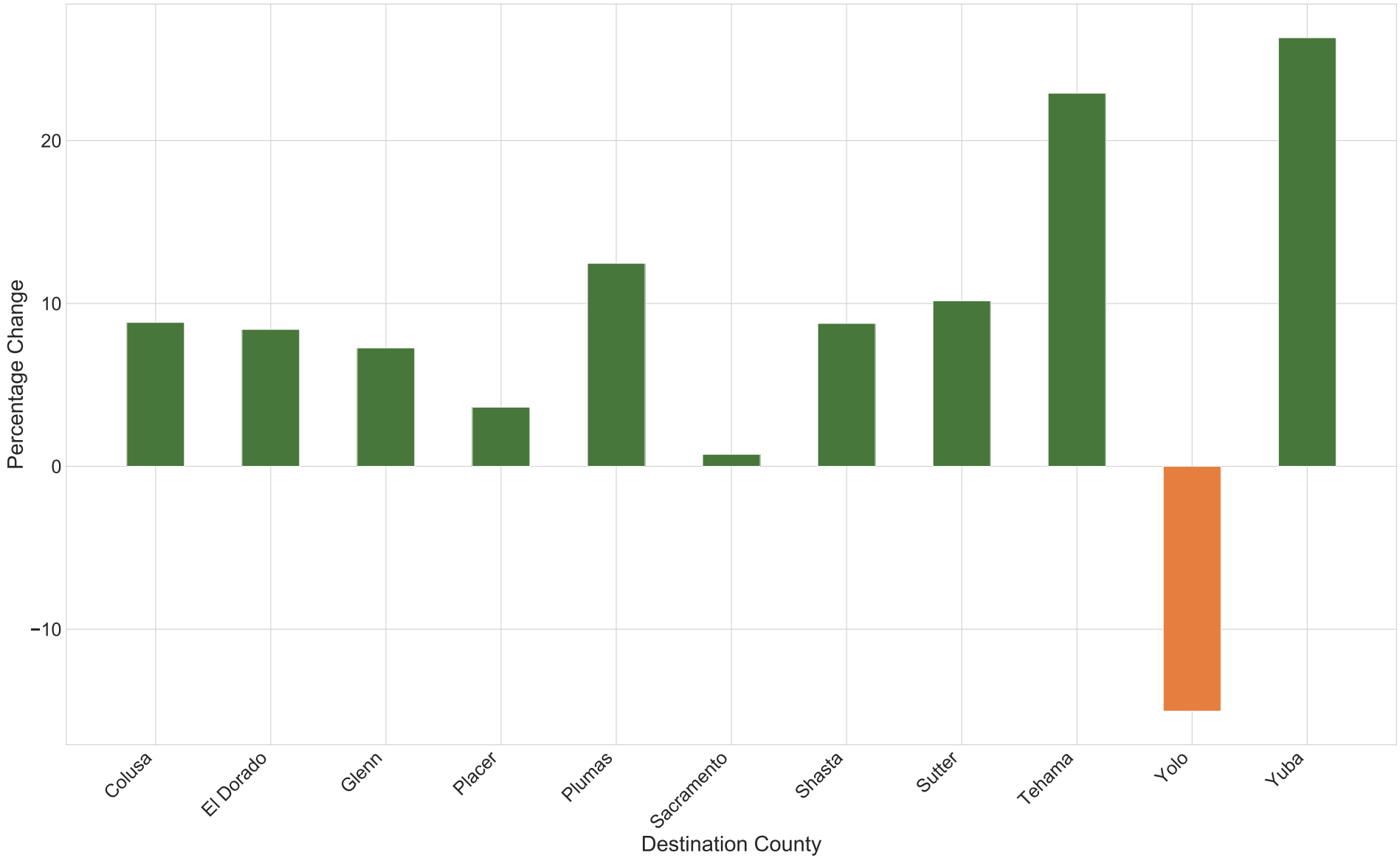


Chart 42: Change in Weekday Trips Exiting Butte County by County of Destination – October

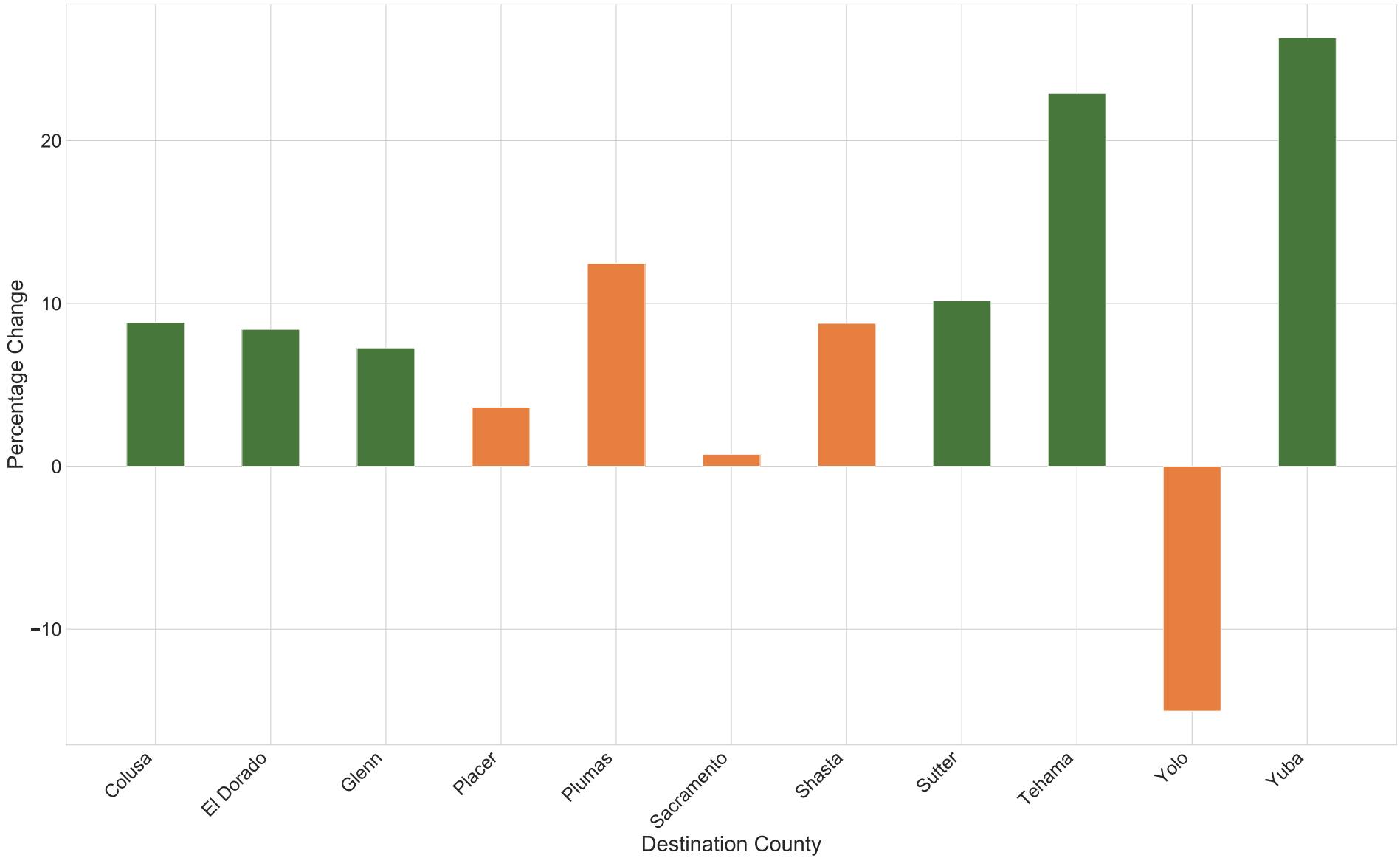


Chart 43: Change in Weekend Trips Exiting Butte County by County of Destination – September

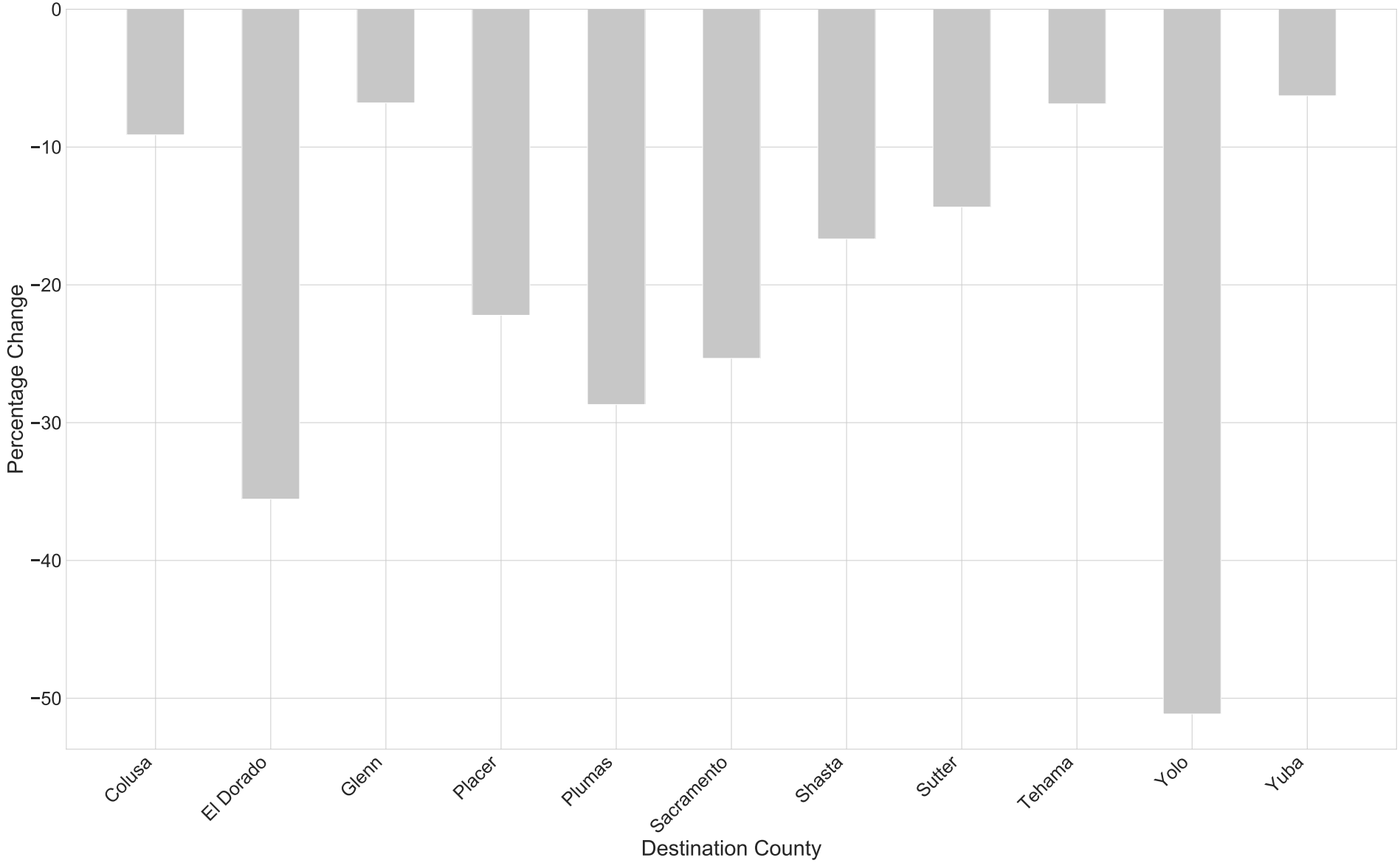


Chart 44: Change in Weekend Trips Exiting Butte County by County of Destination – October

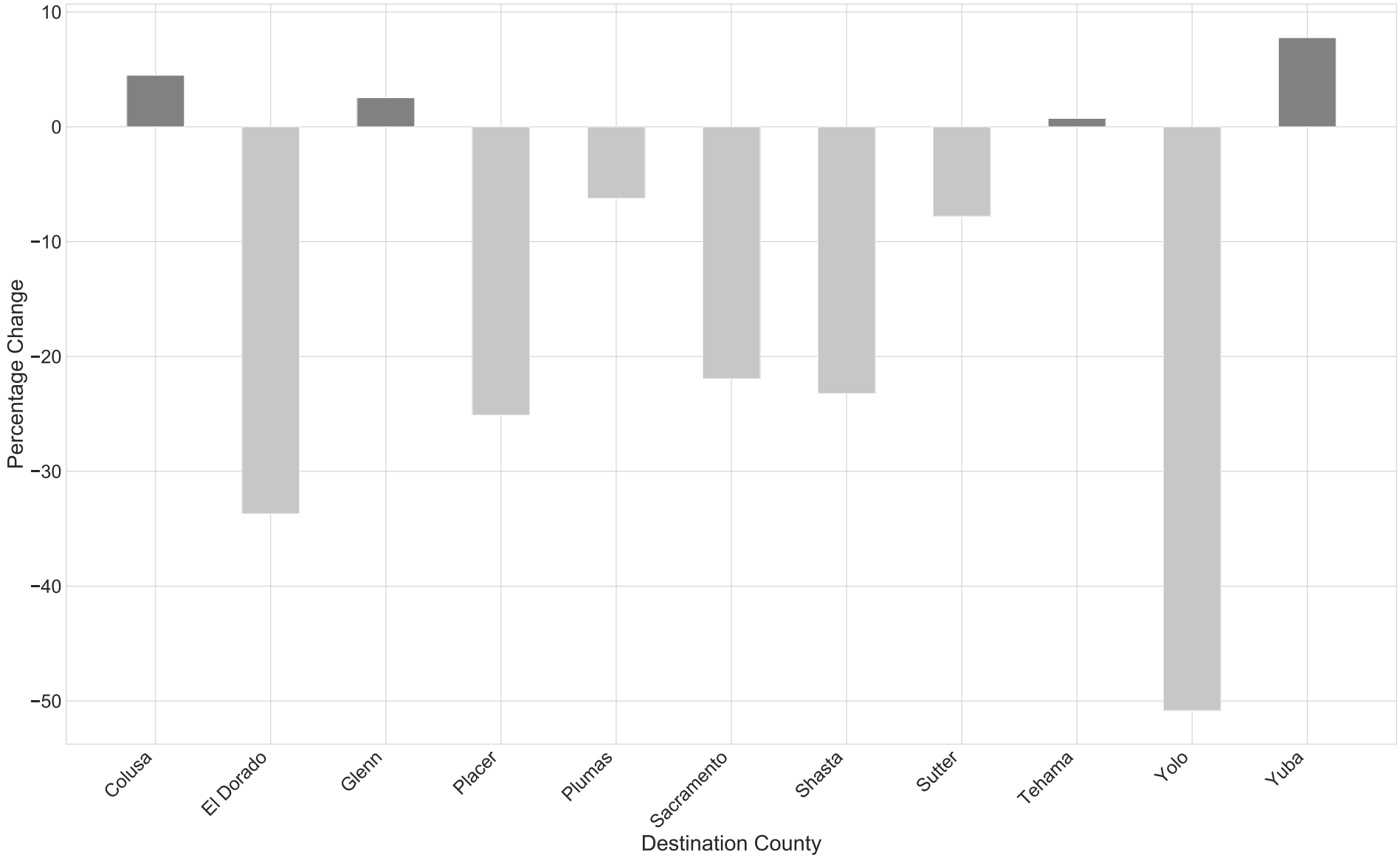


Chart 45: Weekday Trips Within Butte County

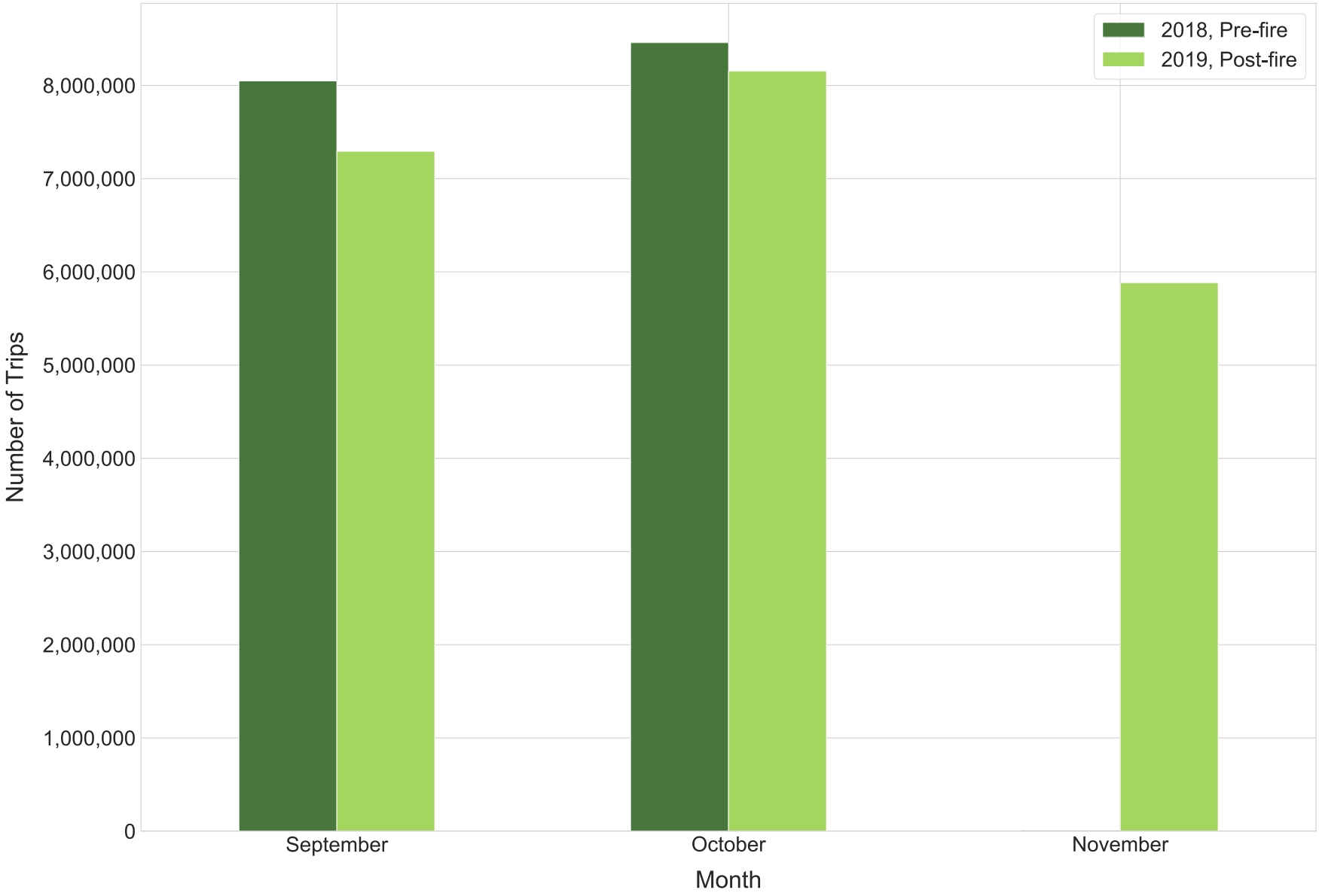


Chart 46: Weekend Trips Within Butte County

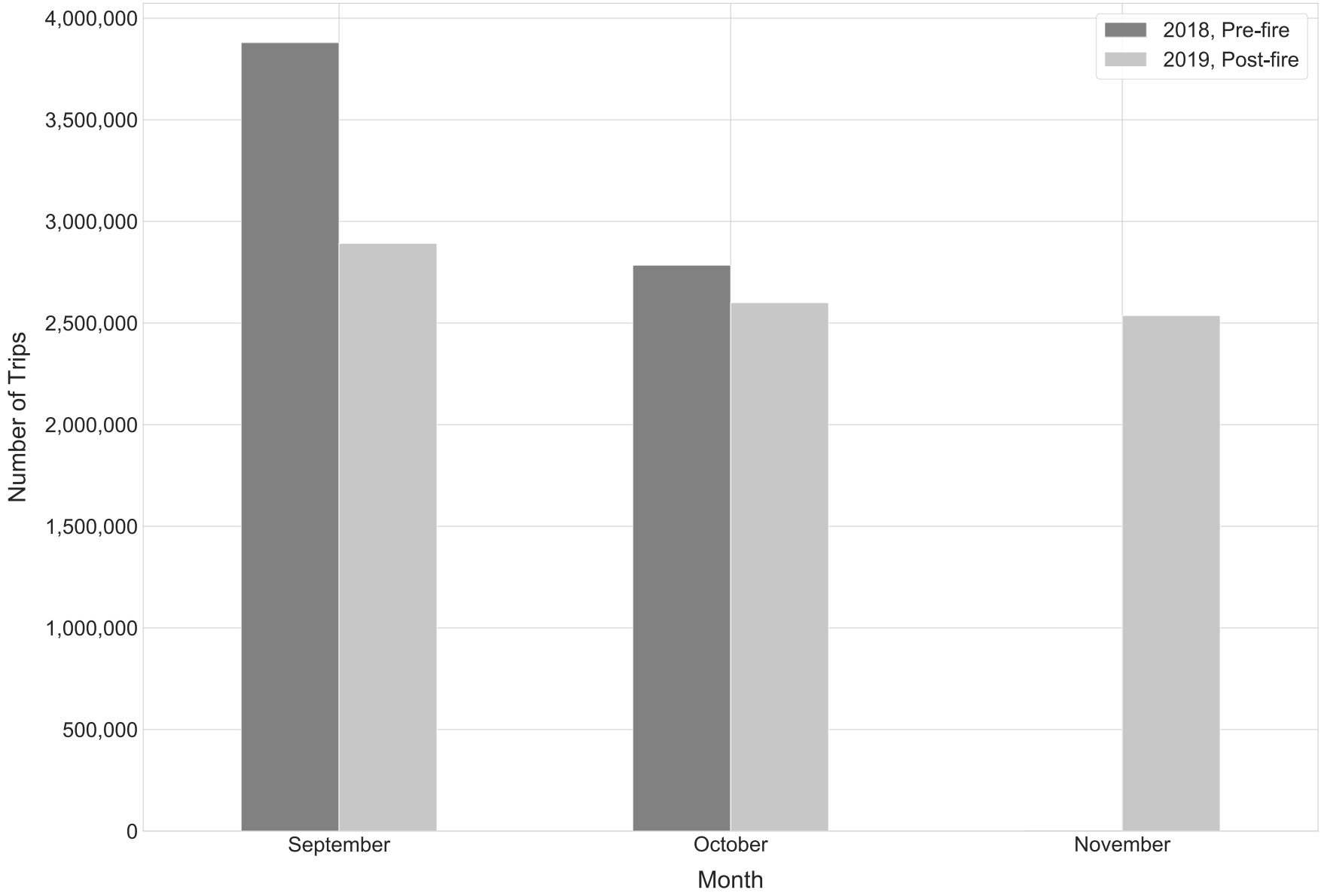


Chart 47: Top 10 Increased Weekday Trips Between Cities Within Butte County by City – September

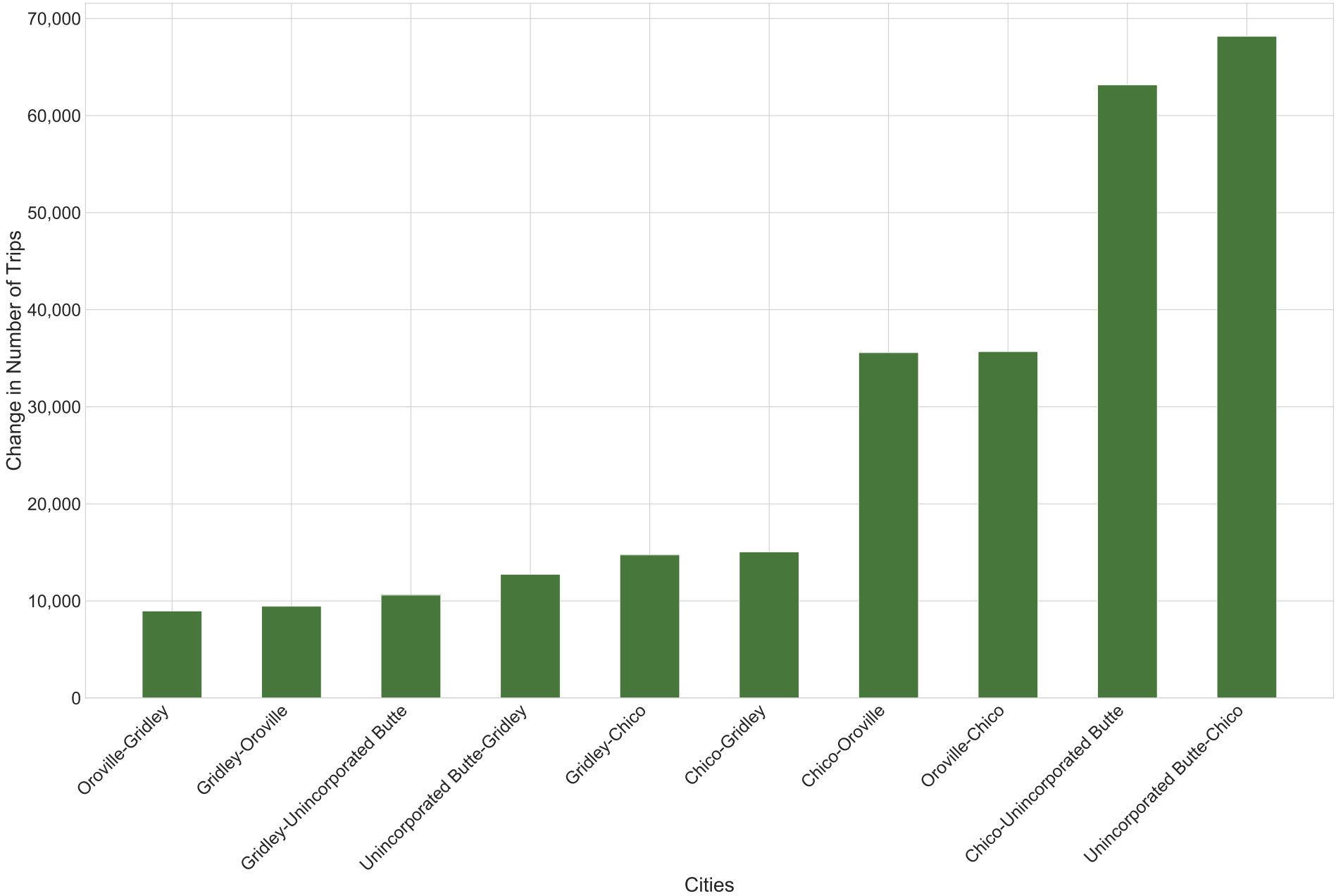


Chart 48: Top 10 Increased Weekday Trips Between Cities Within Butte County by City – October

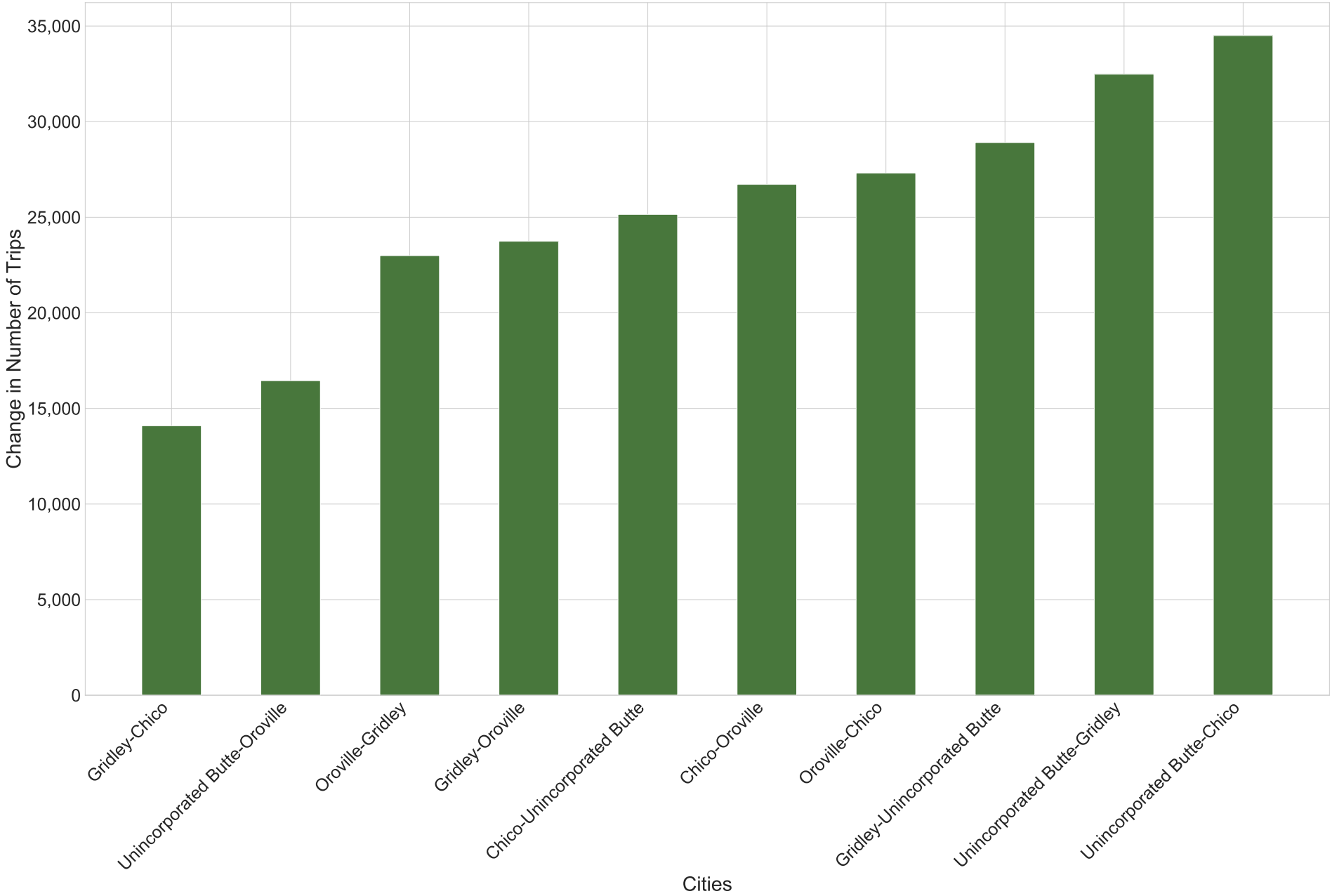


Chart 49: Top 8 Decreased Weekday Trips Between Cities Within Butte County by City – September

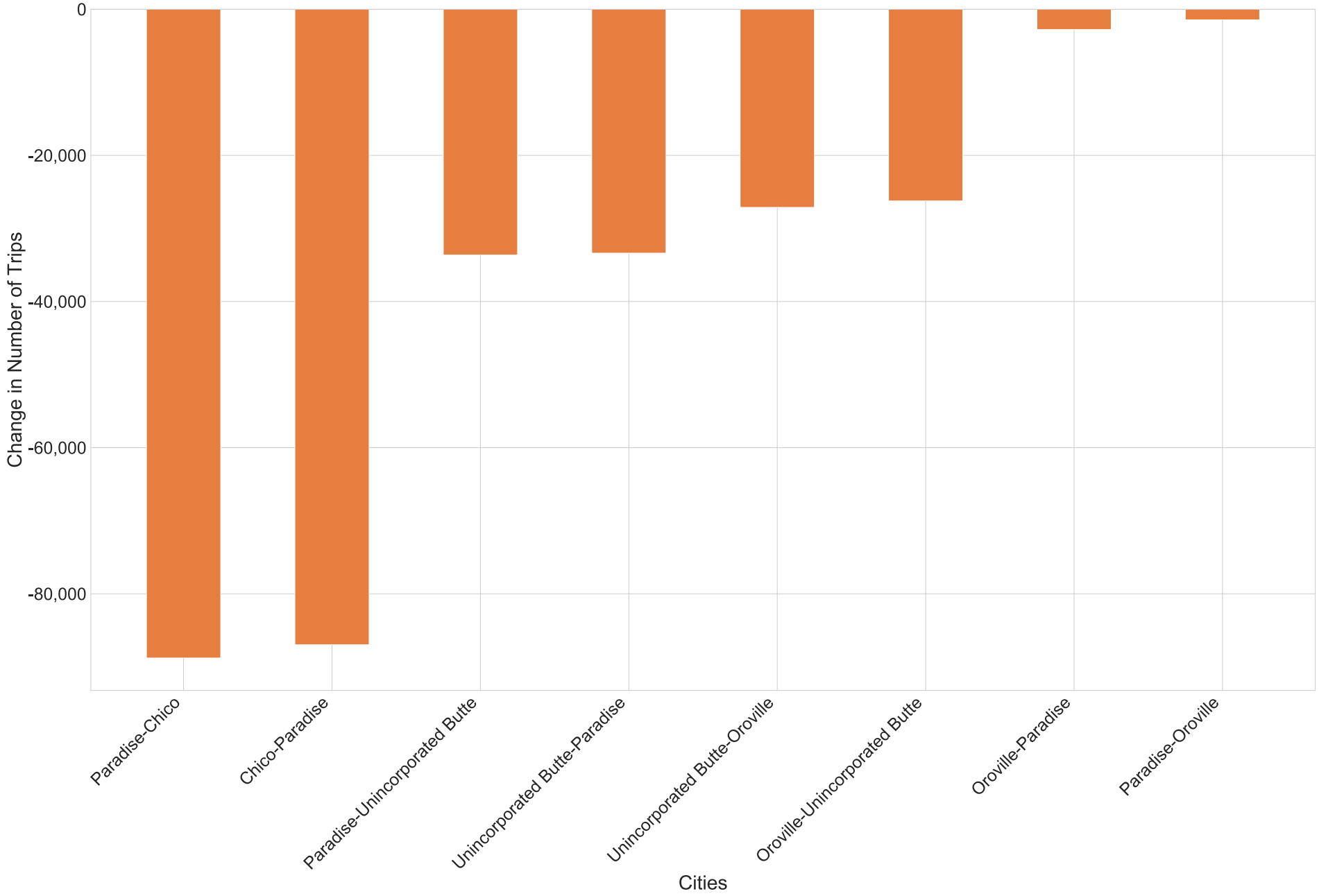


Chart 50: Top 9 Decreased Weekday Trips Between Cities Within Butte County by City – October

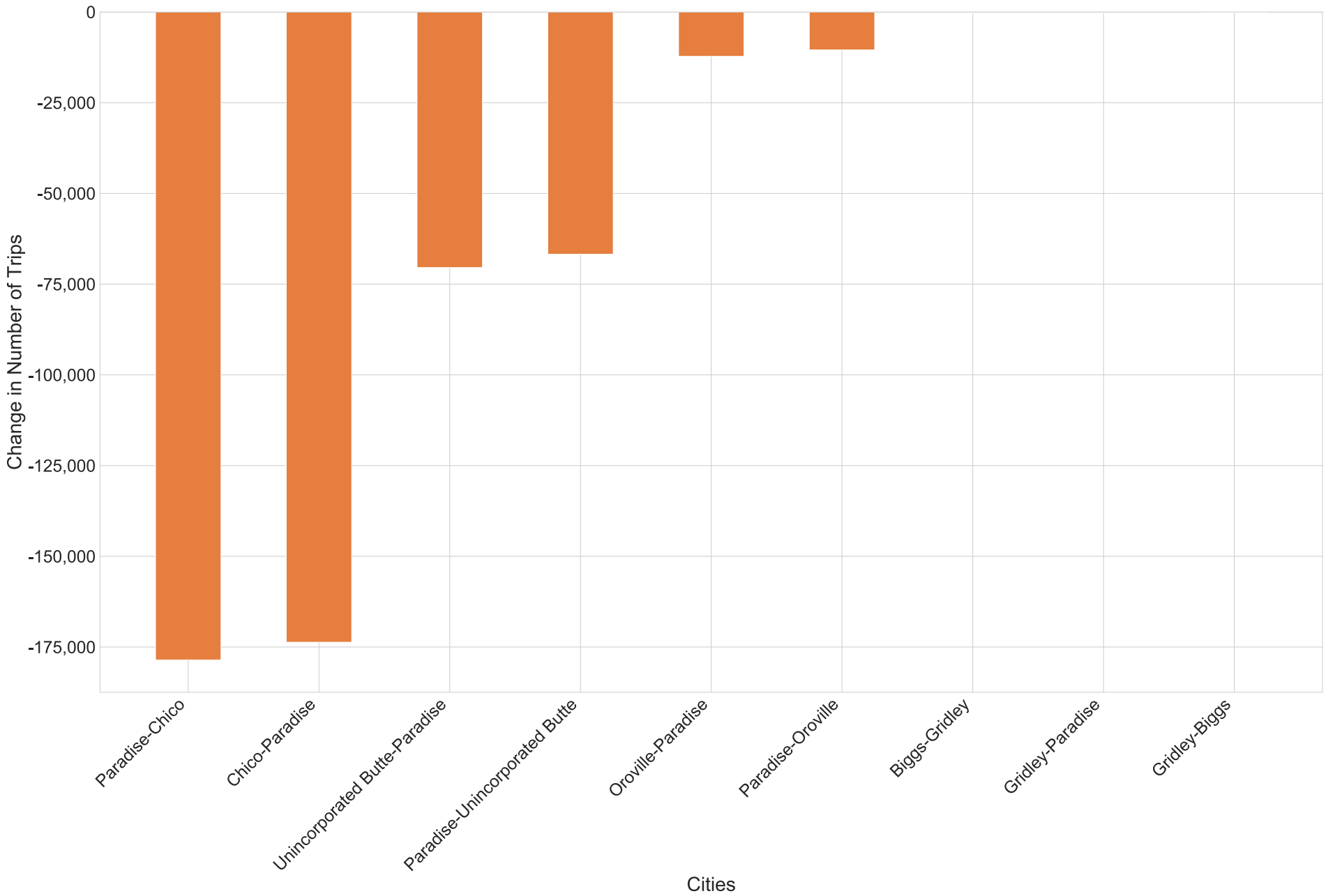


Chart 51: Top 10 Increased Weekend Trips Between Cities Within Butte County by City – September

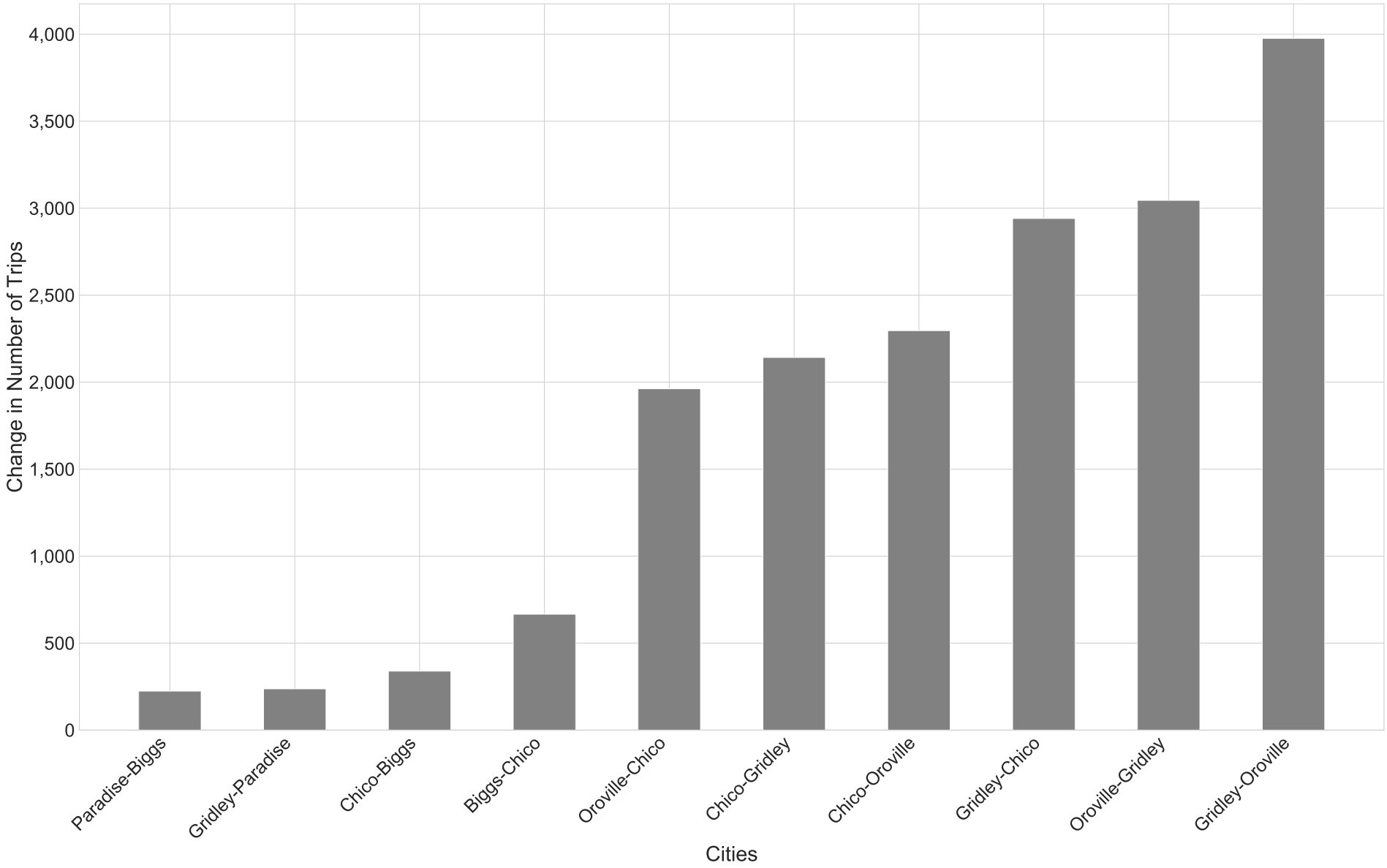


Chart 52: Top 10 Increased Weekend Trips Between Cities Within Butte County by City – October

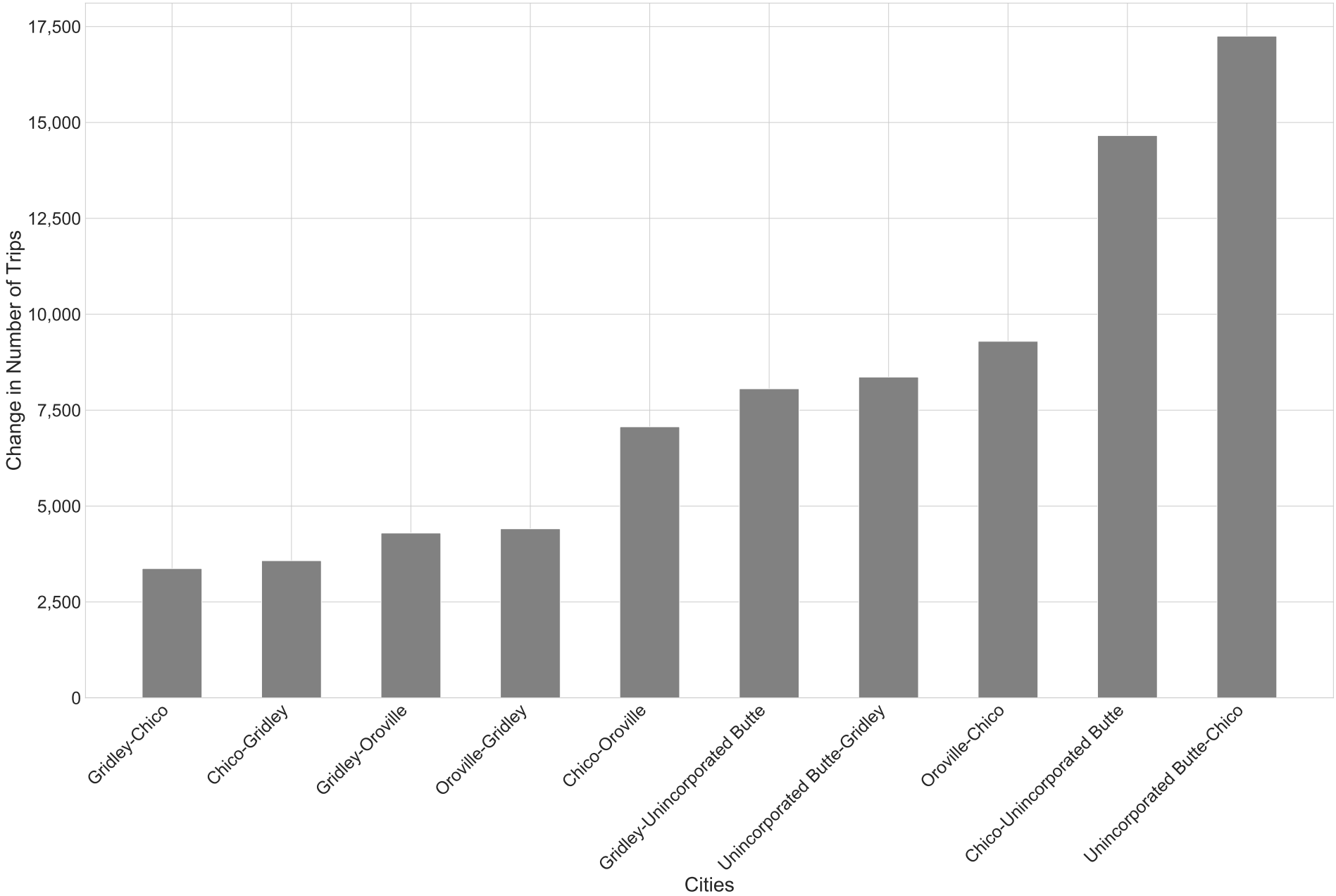


Chart 53: Top 8 Decreased Weekend Trips Between Cities Within Butte County by City – September

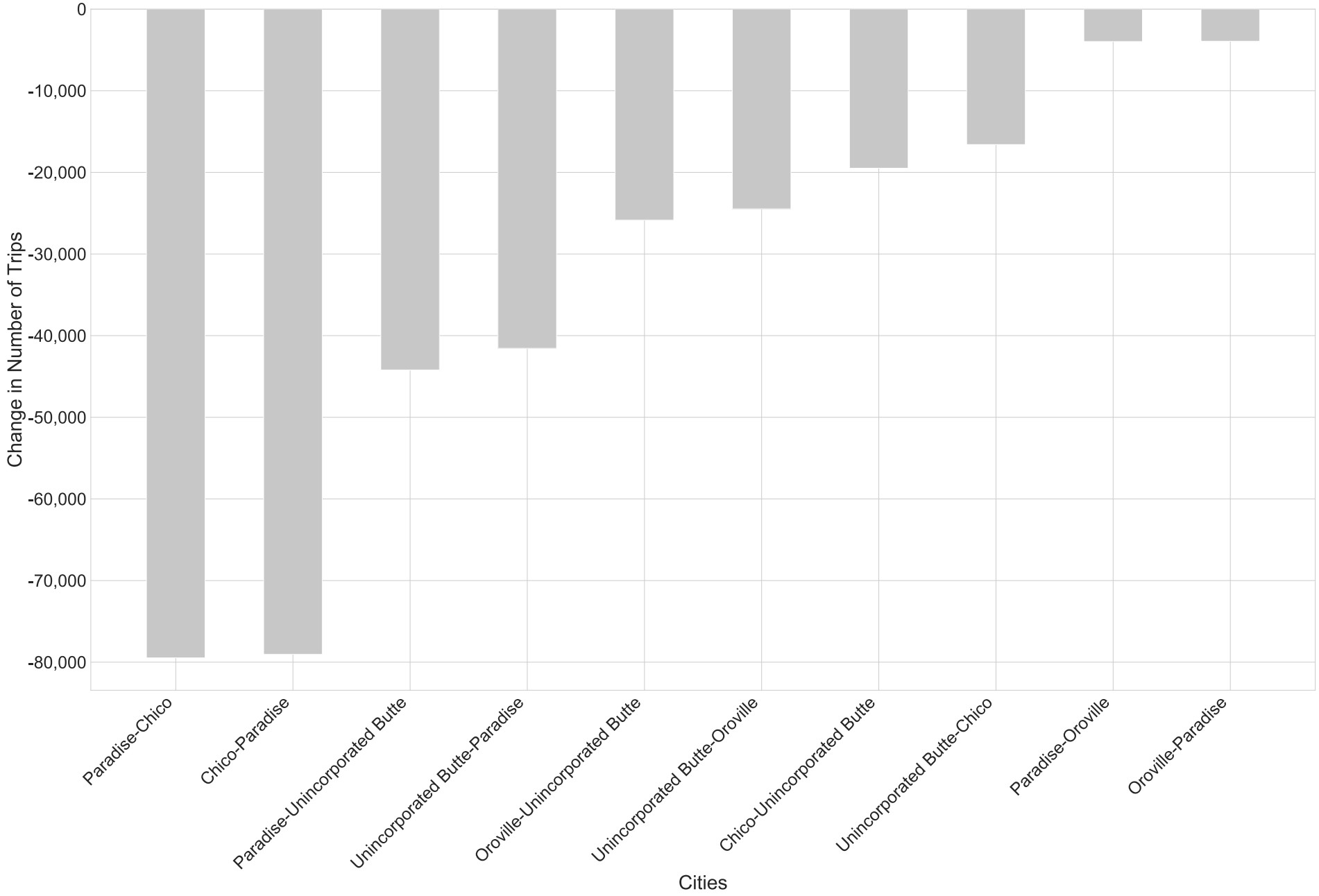


Chart 54: Top 9 Decreased Weekend Trips Between Cities Within Butte County by City – October

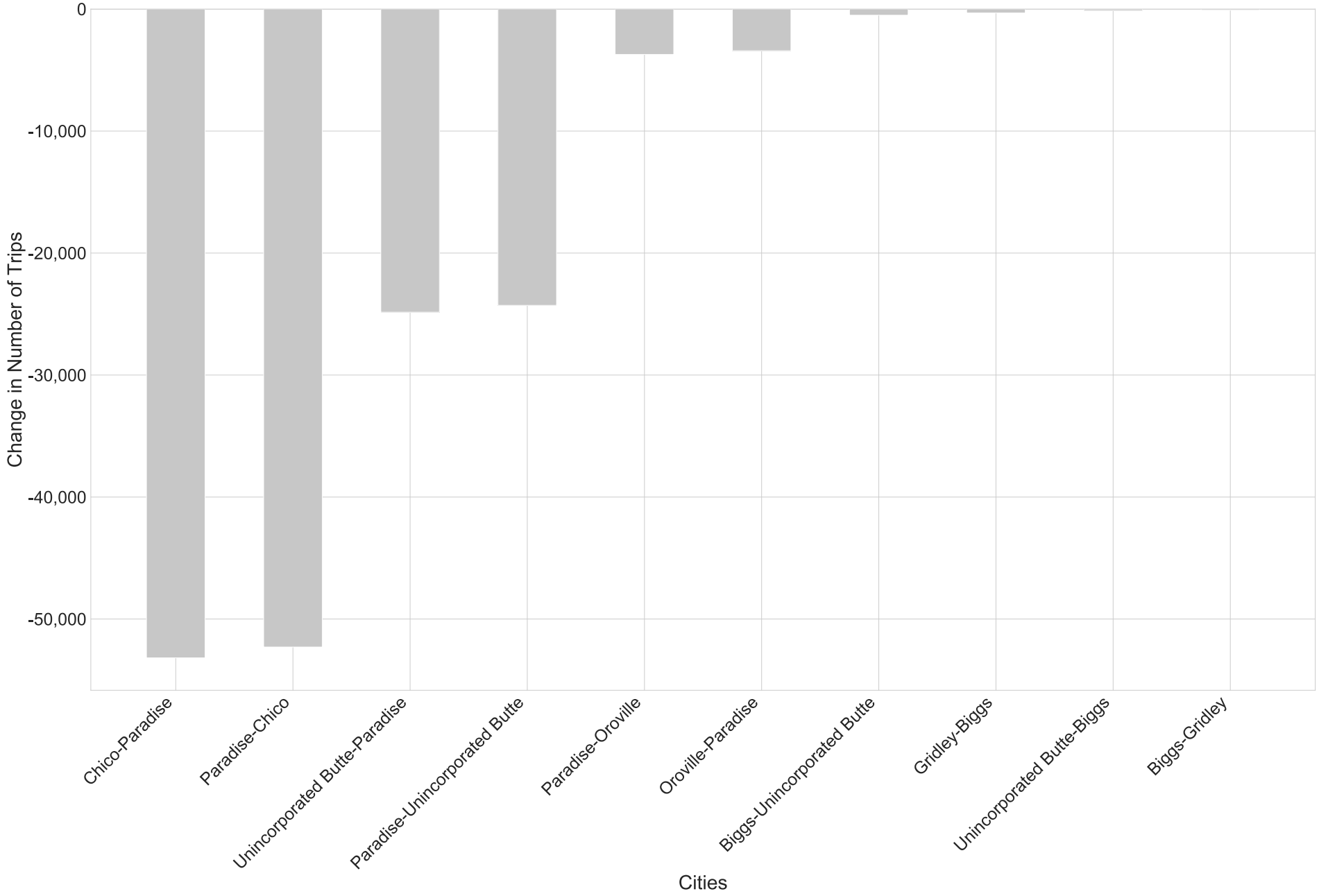


Chart 55: Weekday Work-bound Trips Starting or Ending in Butte County

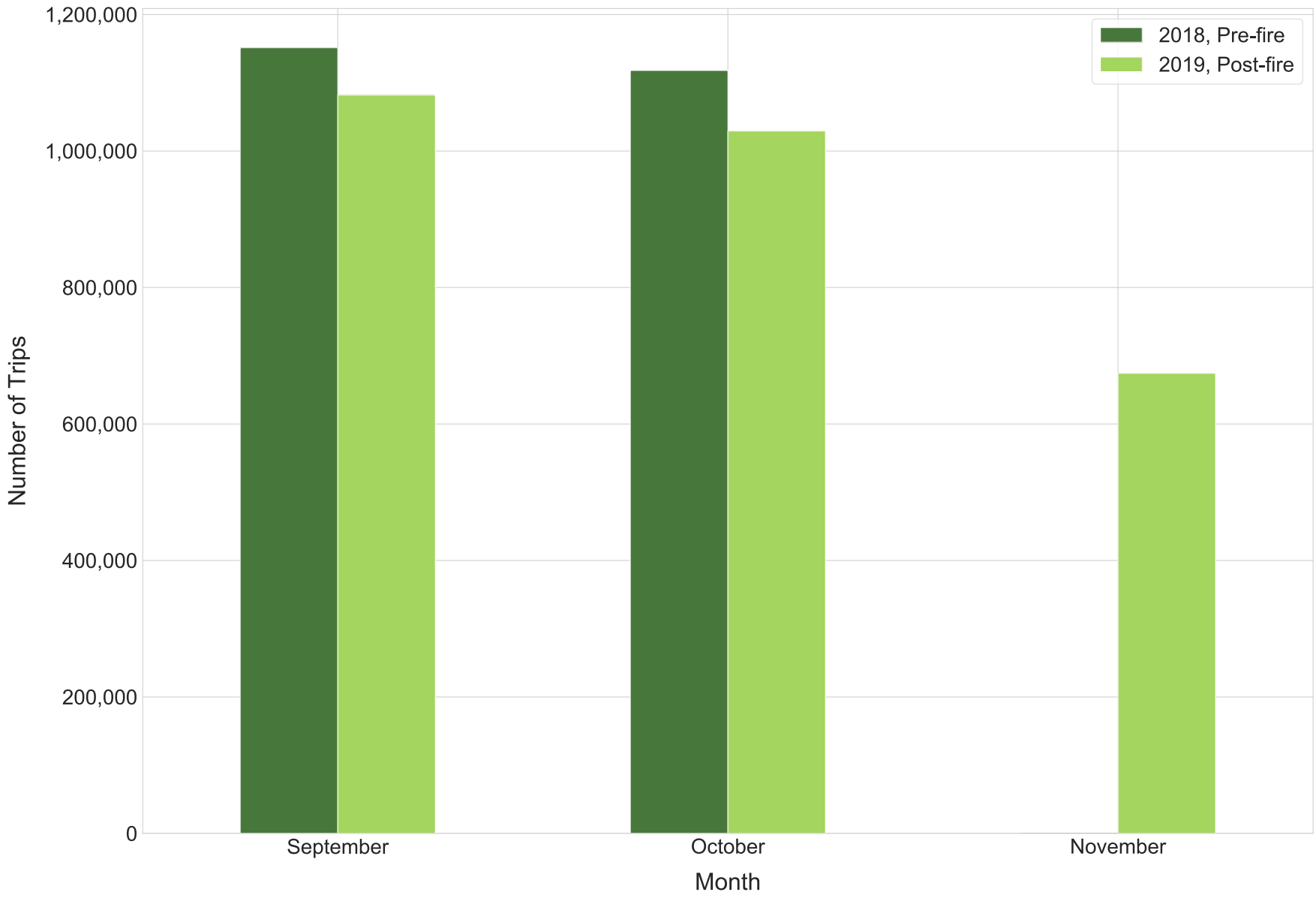


Chart 56: Weekday Home-bound Trips Starting or Ending in Butte County

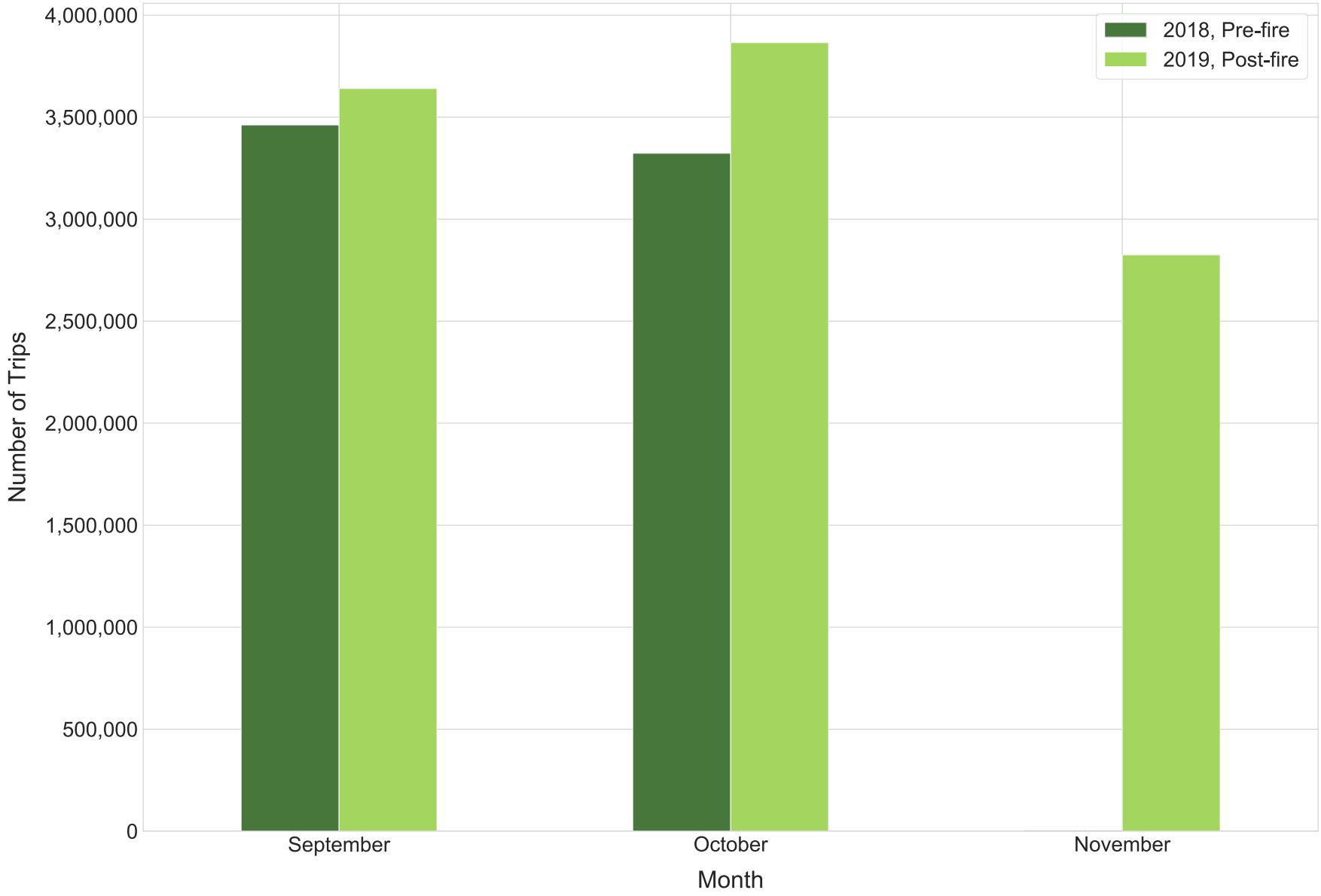


Chart 57: Weekday Other-bound Trips Starting or Ending in Butte County

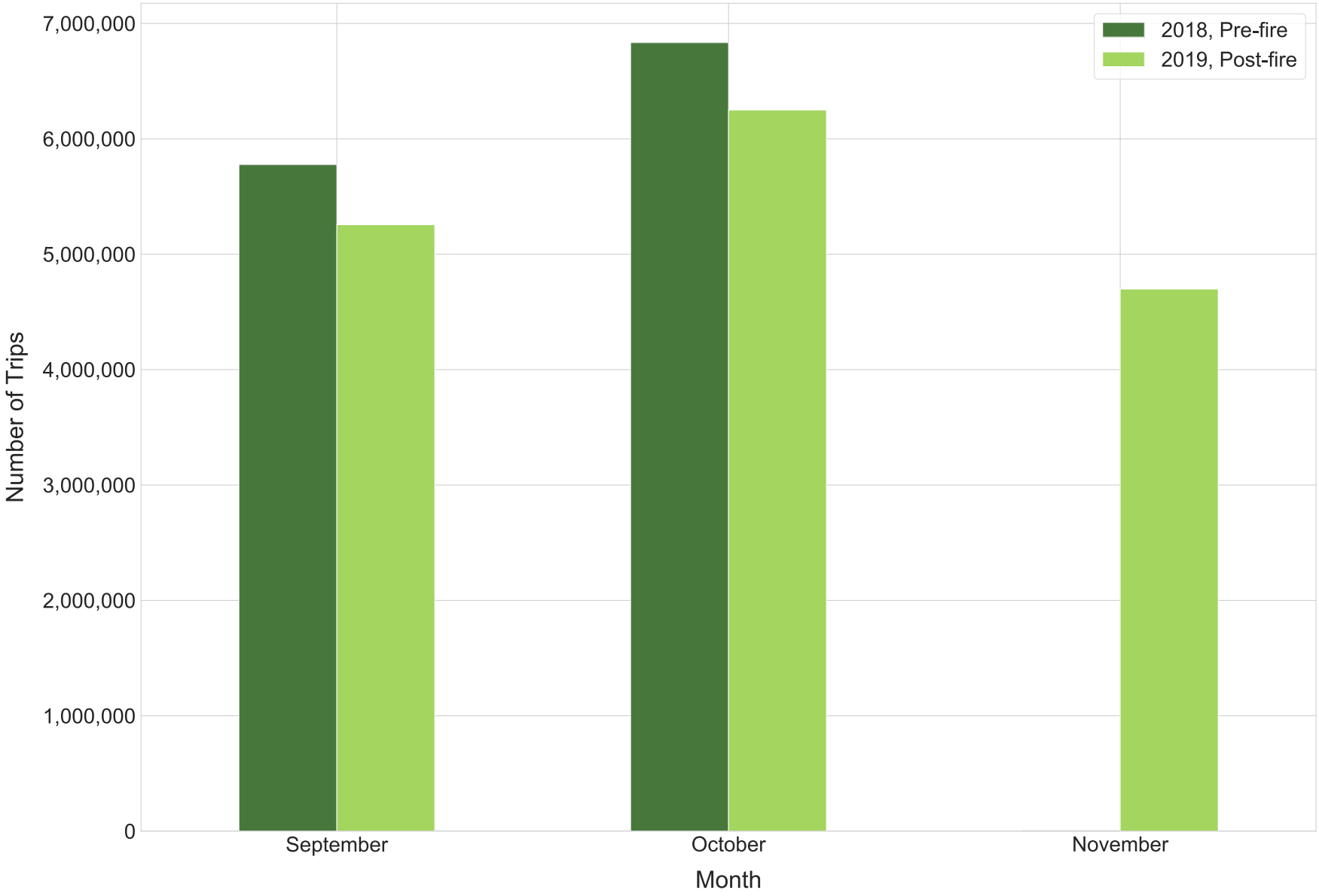


Chart 58: Top 10 Increased Work-bound Trips Between Cities Within Butte County – September

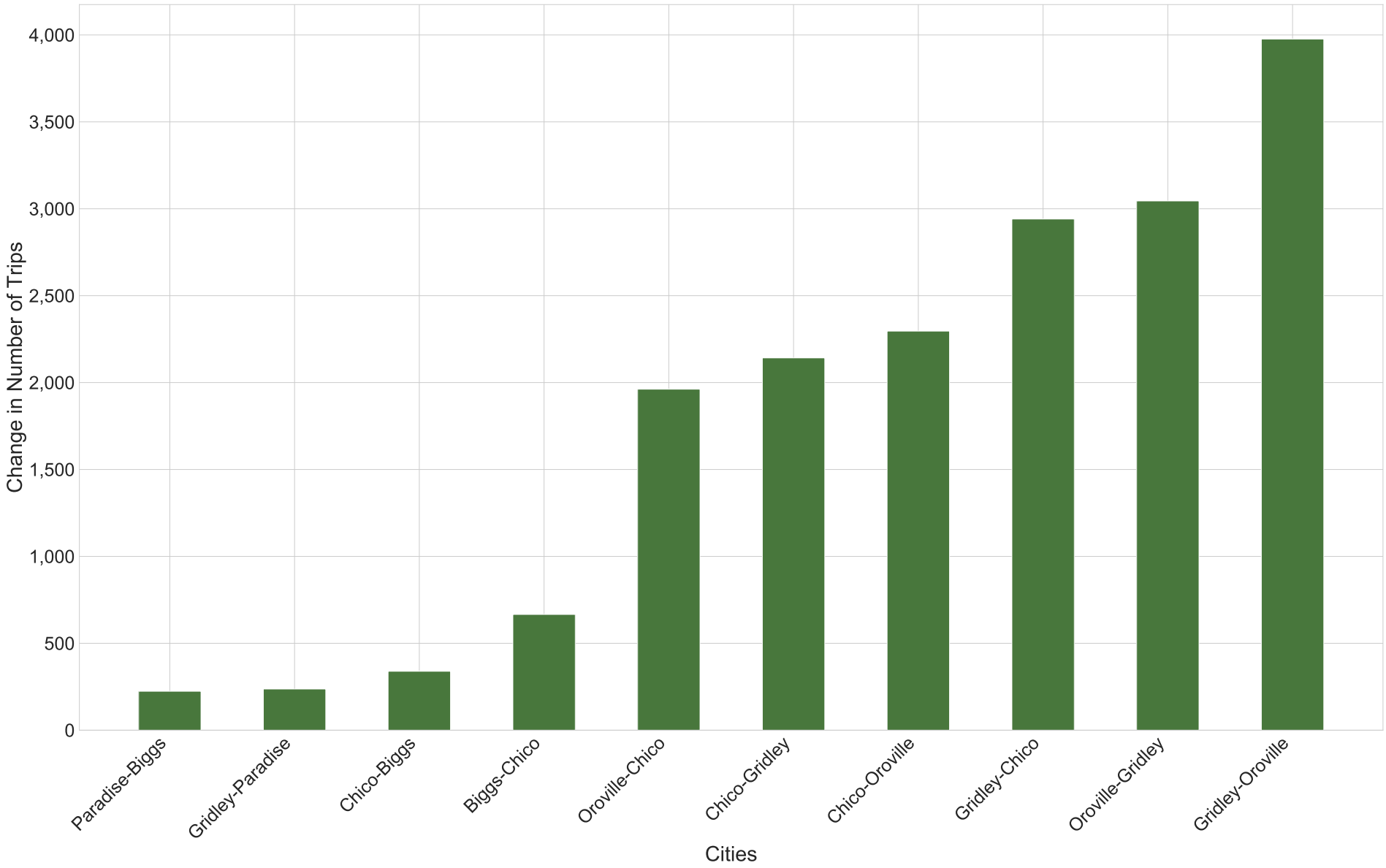


Chart 59: Top 10 Increased Work-bound Trips Between Cities Within Butte County – October

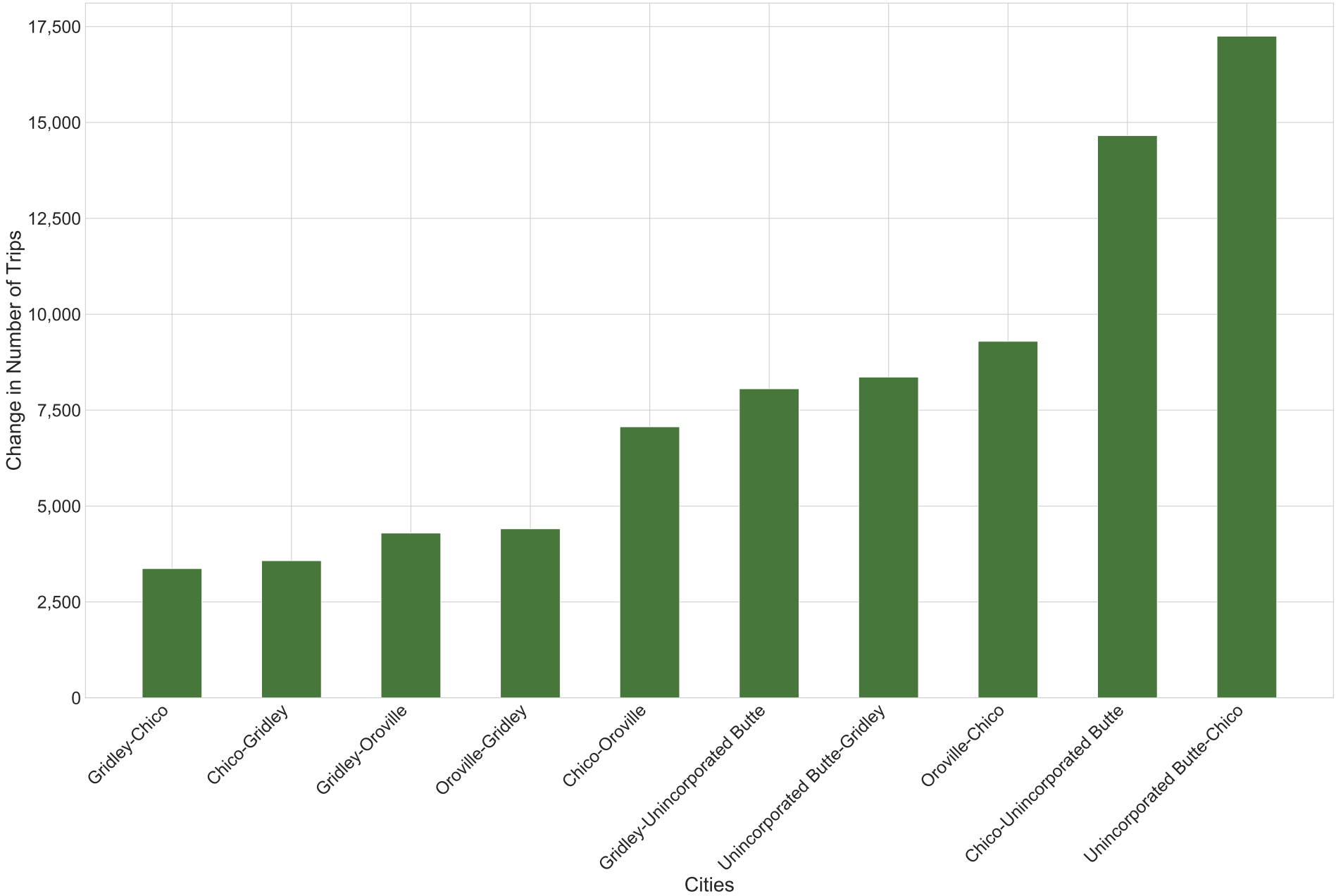


Chart 60: Top 10 Decreased Work-bound Trips Between Cities Within Butte County – September

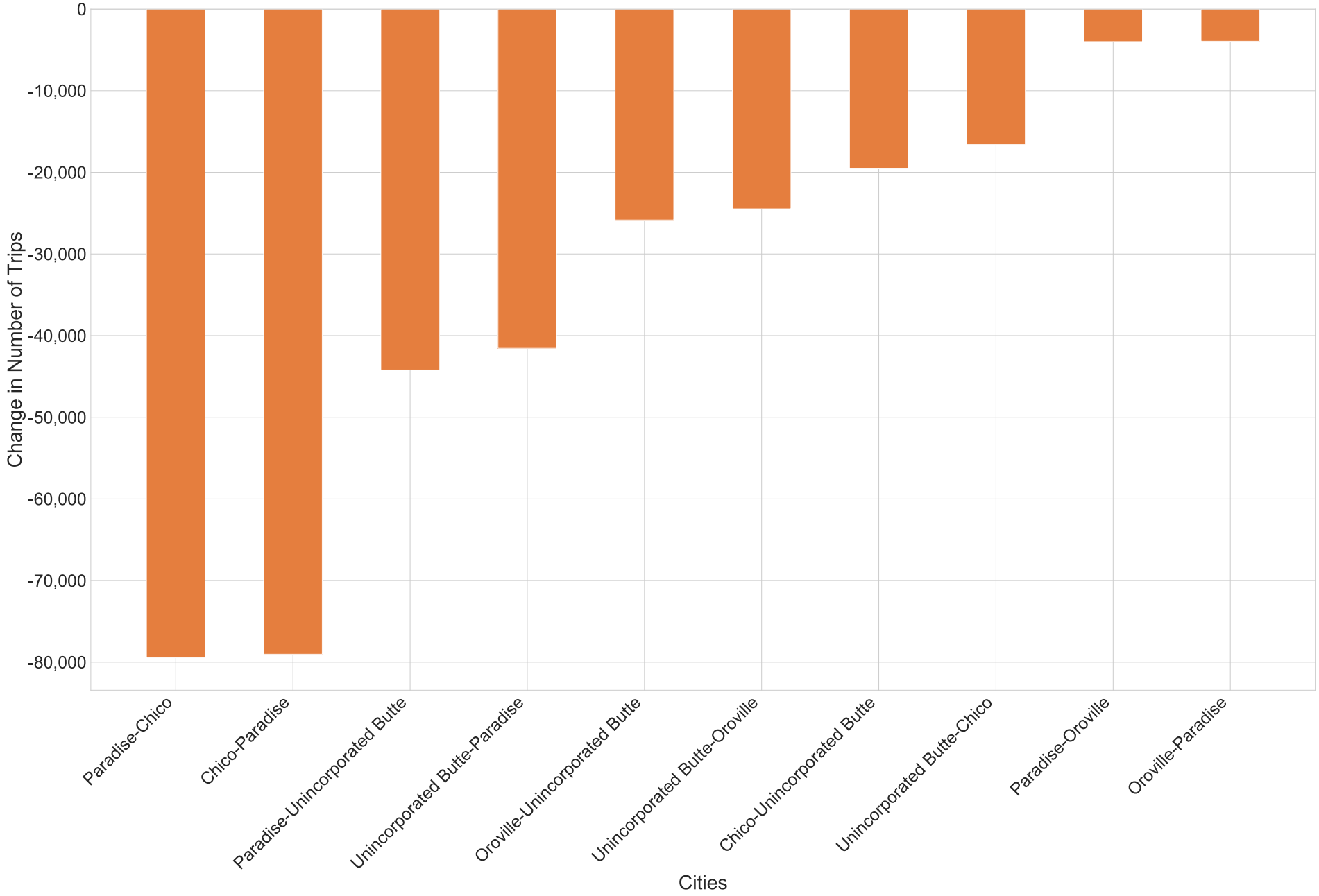


Chart 61: Top 10 Decreased Work-bound Trips Between Cities Within Butte County – October

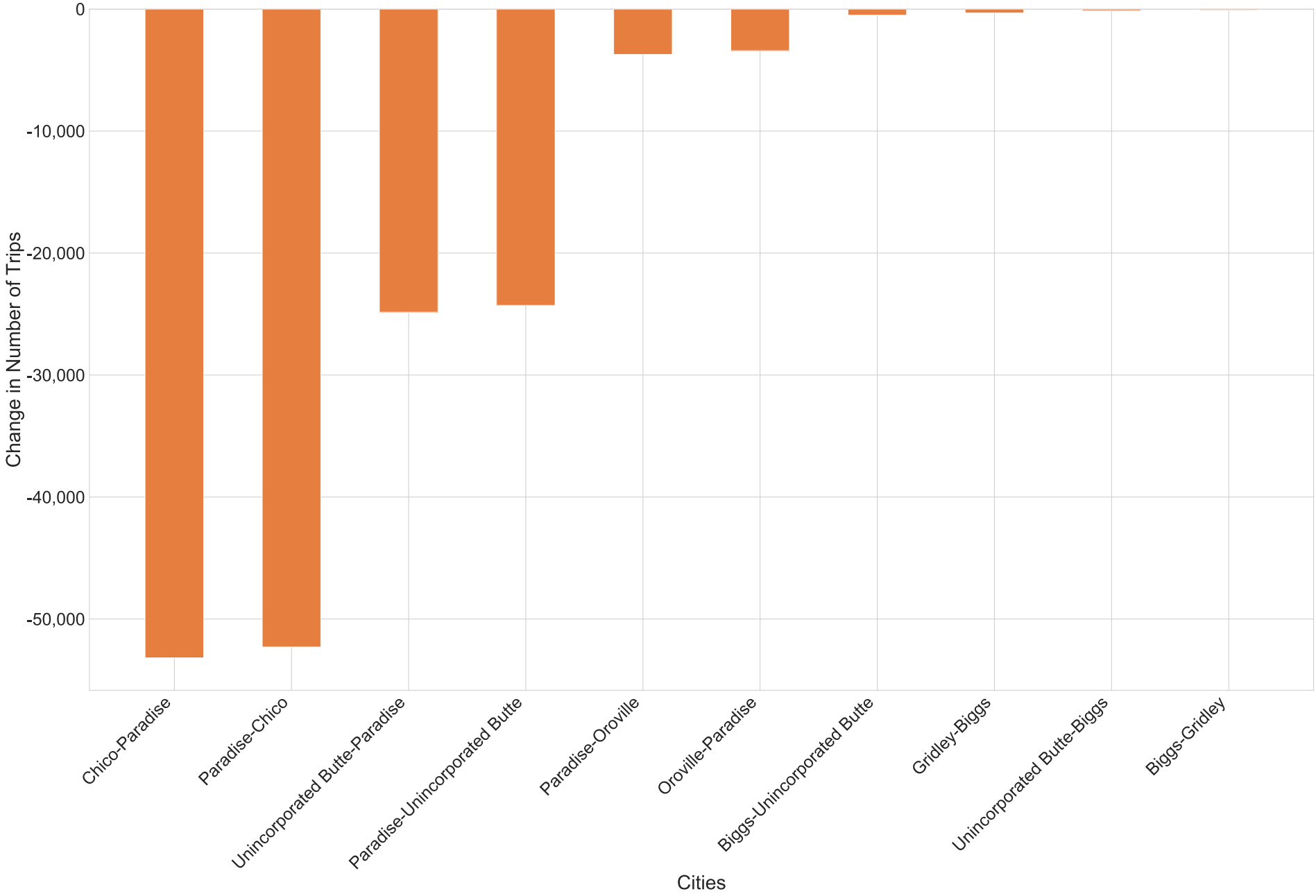


Chart 62: Top 10 Increased Home-bound Trips Between Cities Within Butte County – September

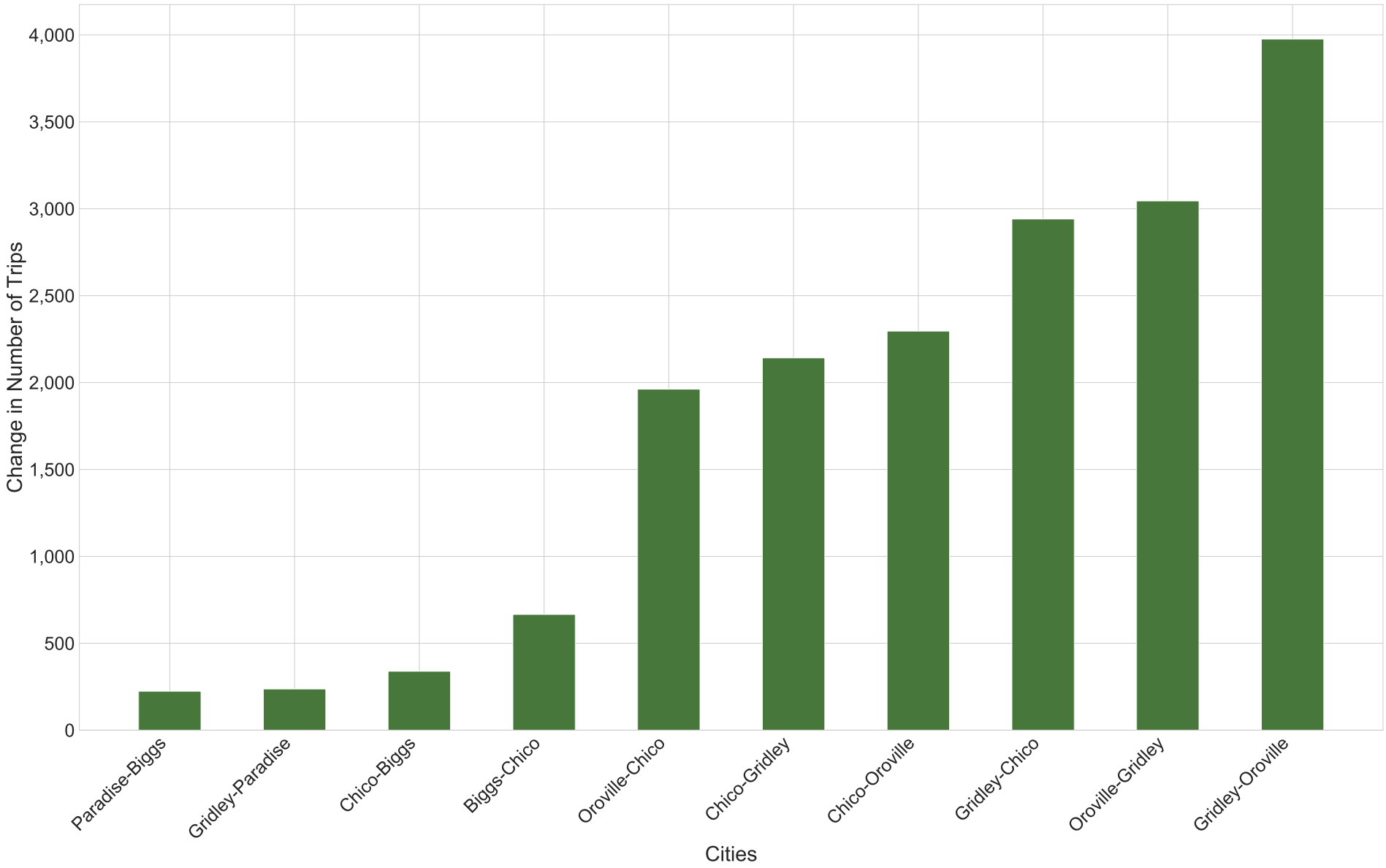


Chart 63: Top 10 Increased Home-bound Trips Between Cities Within Butte County – October

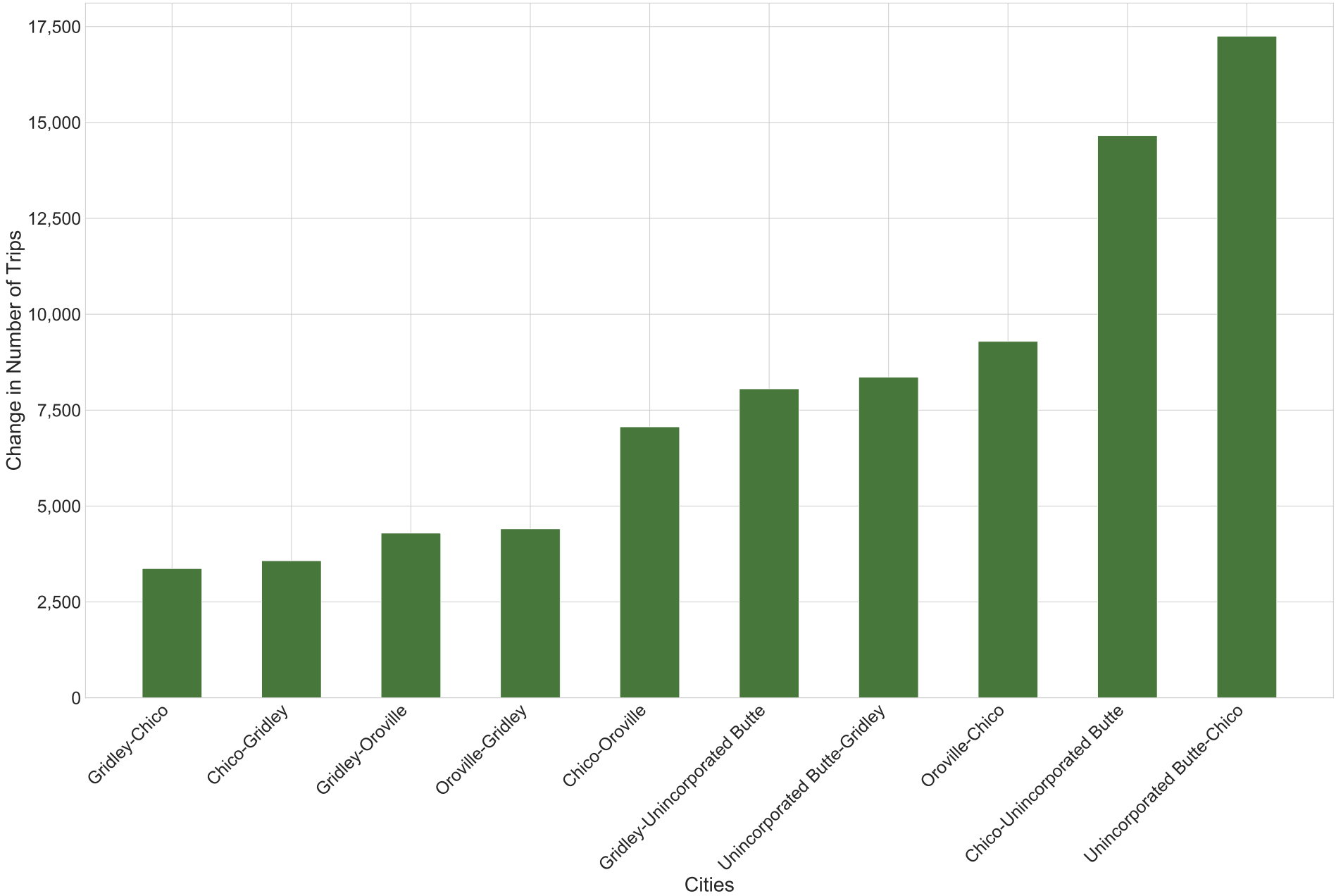


Chart 64: Top 10 Decreased Home-bound Trips Between Cities Within Butte County – September

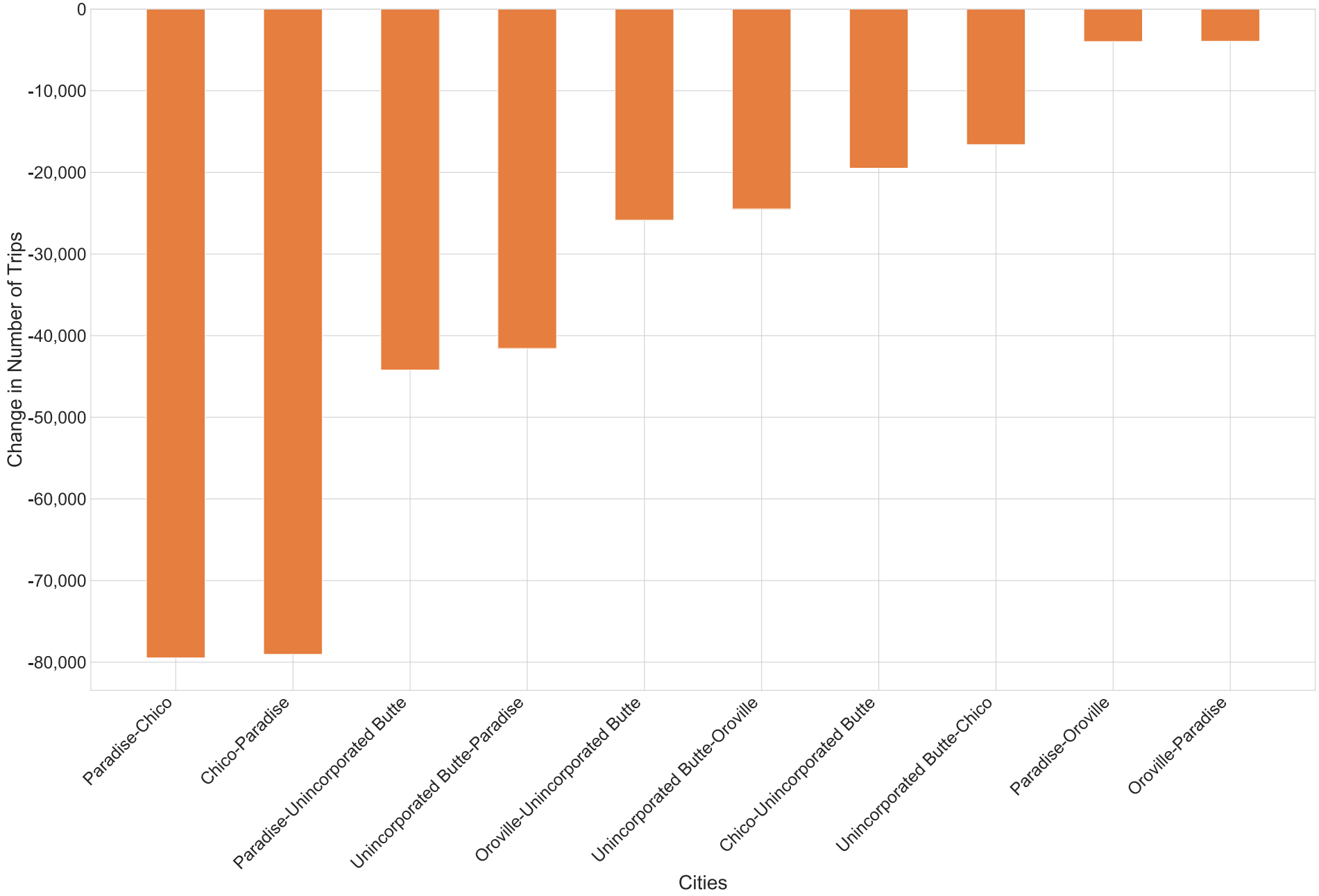


Chart 65: Top 10 Decreased Home-bound Trips Between Cities Within Butte County – October

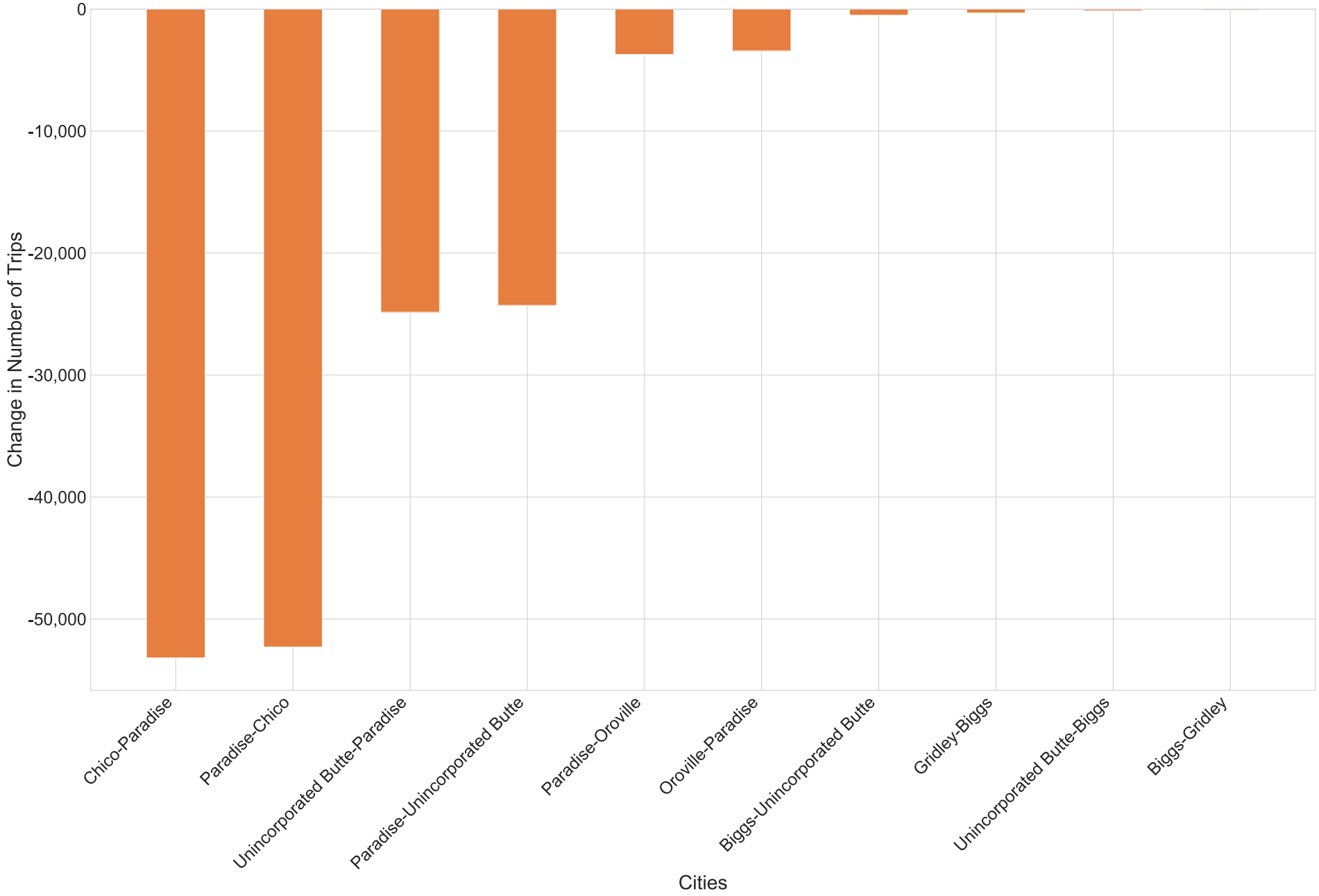


Chart 66: Top 10 Increased Other-bound Trips Between Cities Within Butte County – September

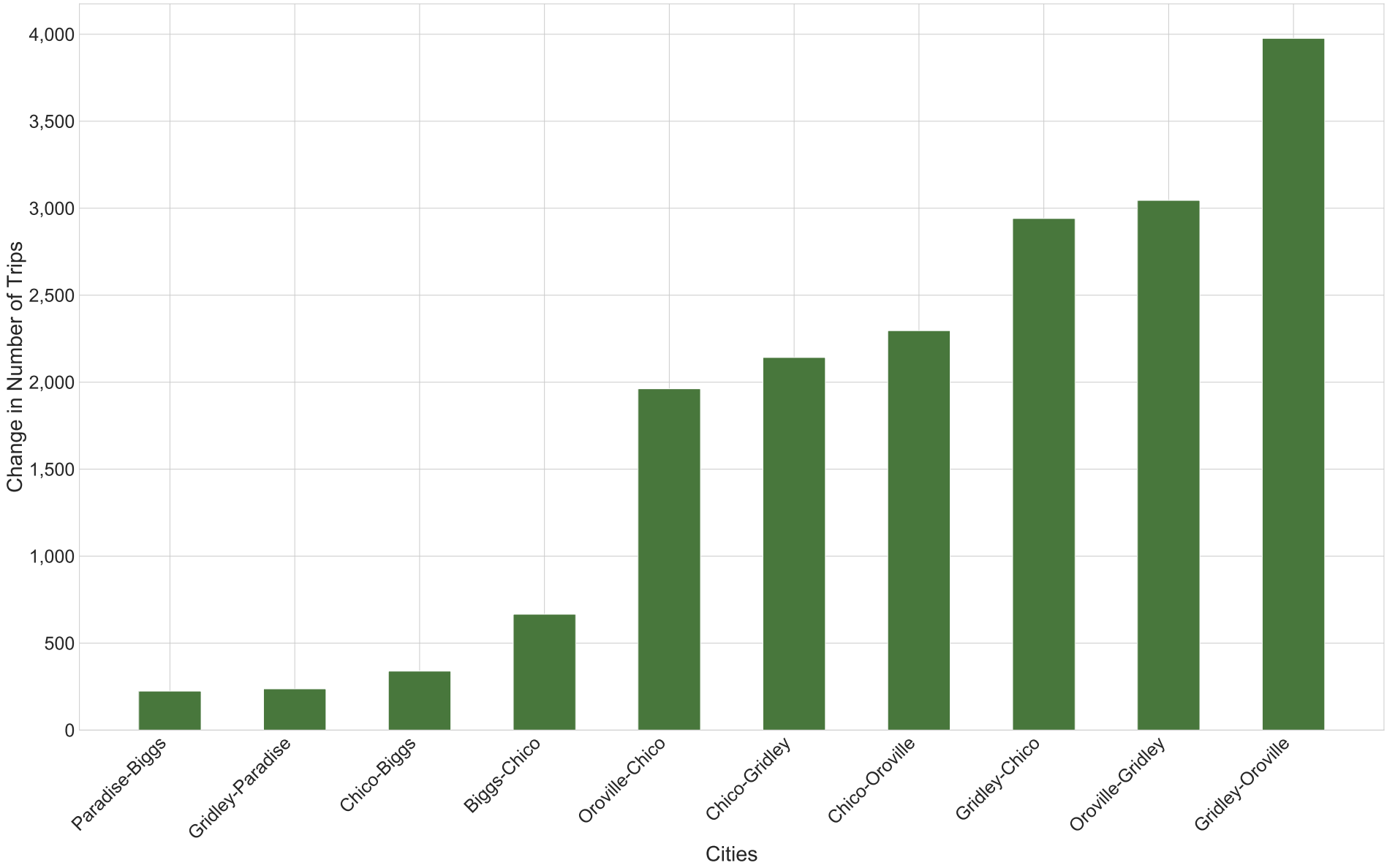


Chart 67: Top 10 Increased Other-bound Trips Between Cities Within Butte County – October

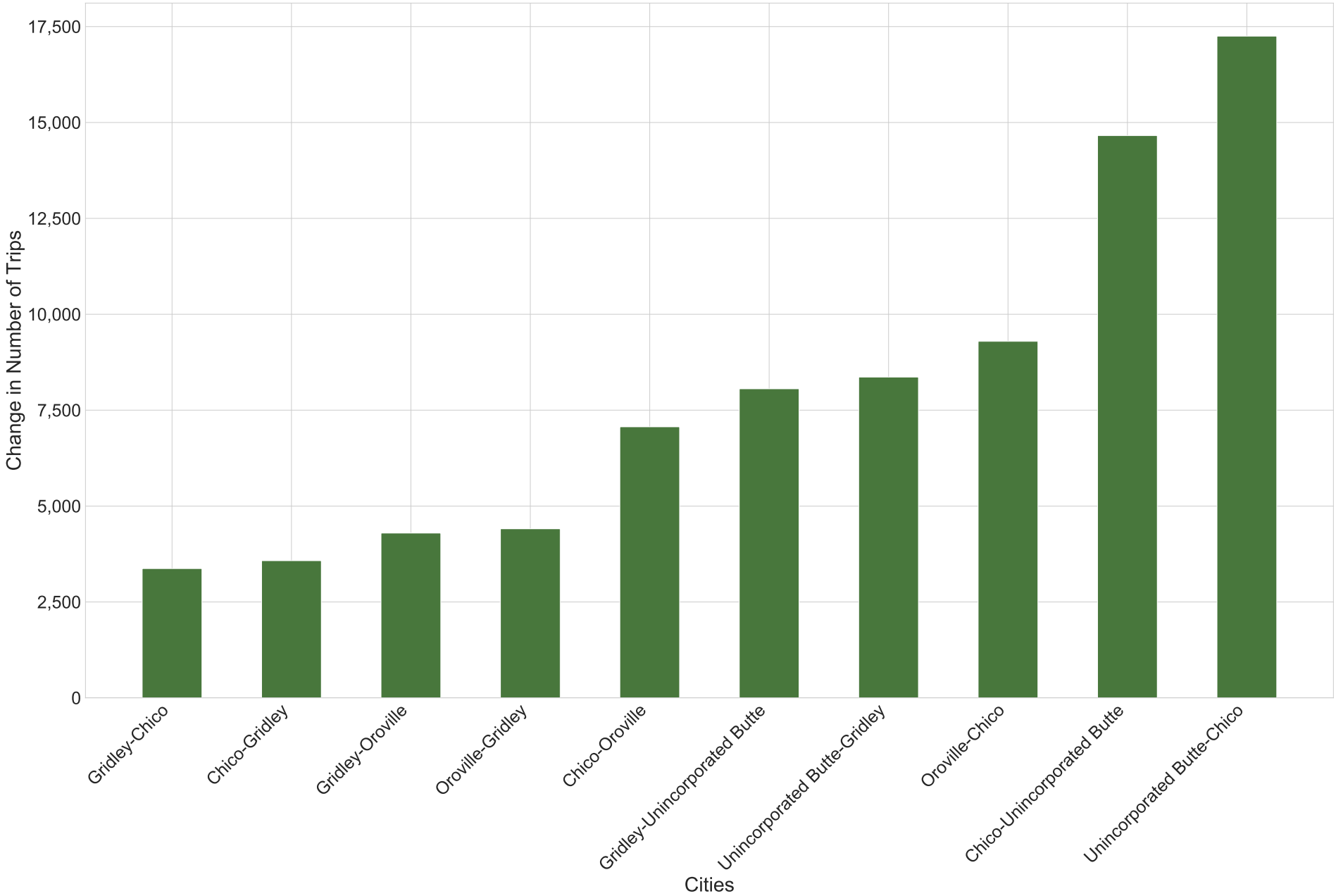


Chart 68: Top 10 Decreased Other-bound Trips Between Cities Within Butte County – September

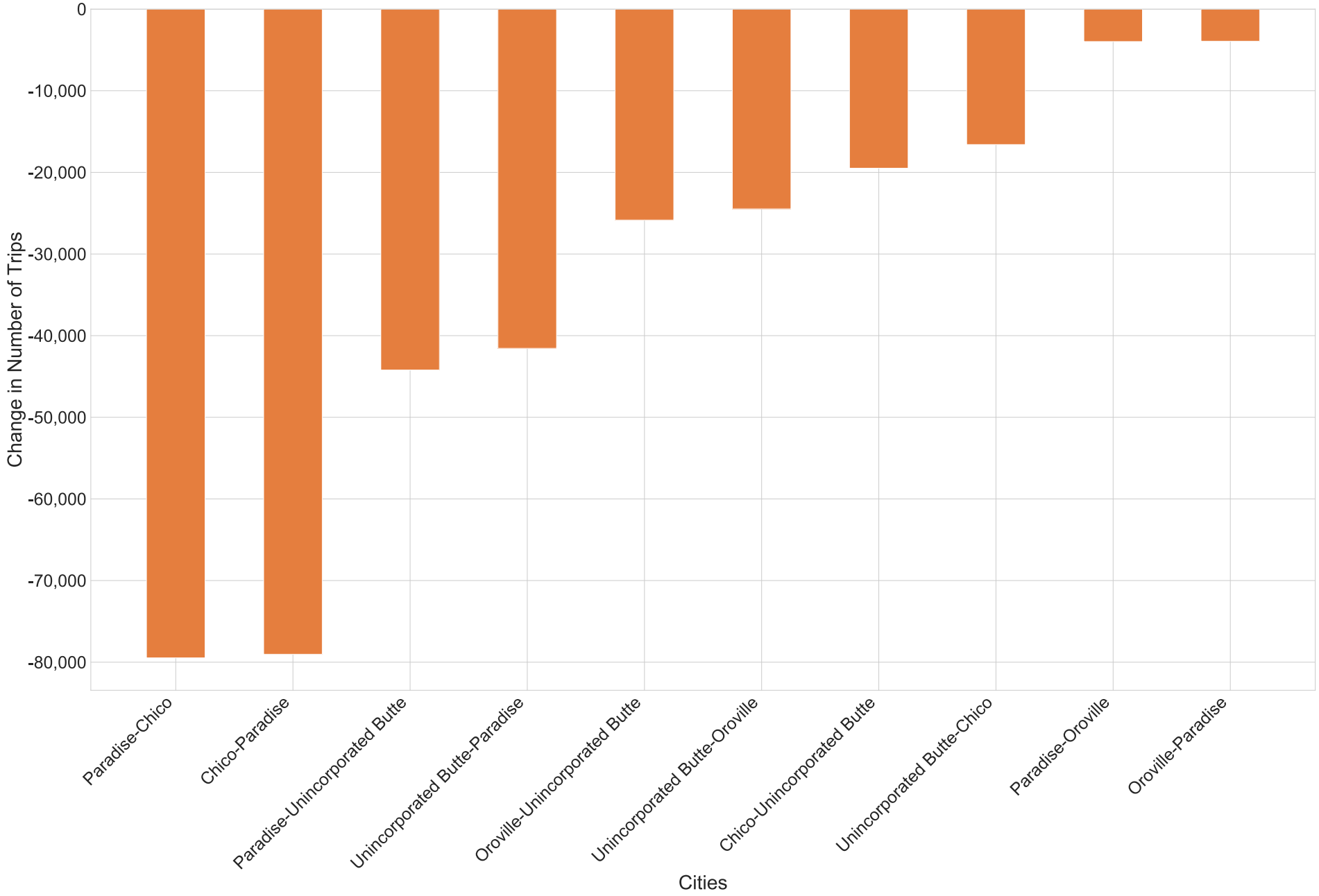


Chart 69: Top 10 Decreased Other-bound Trips Between Cities Within Butte County – October

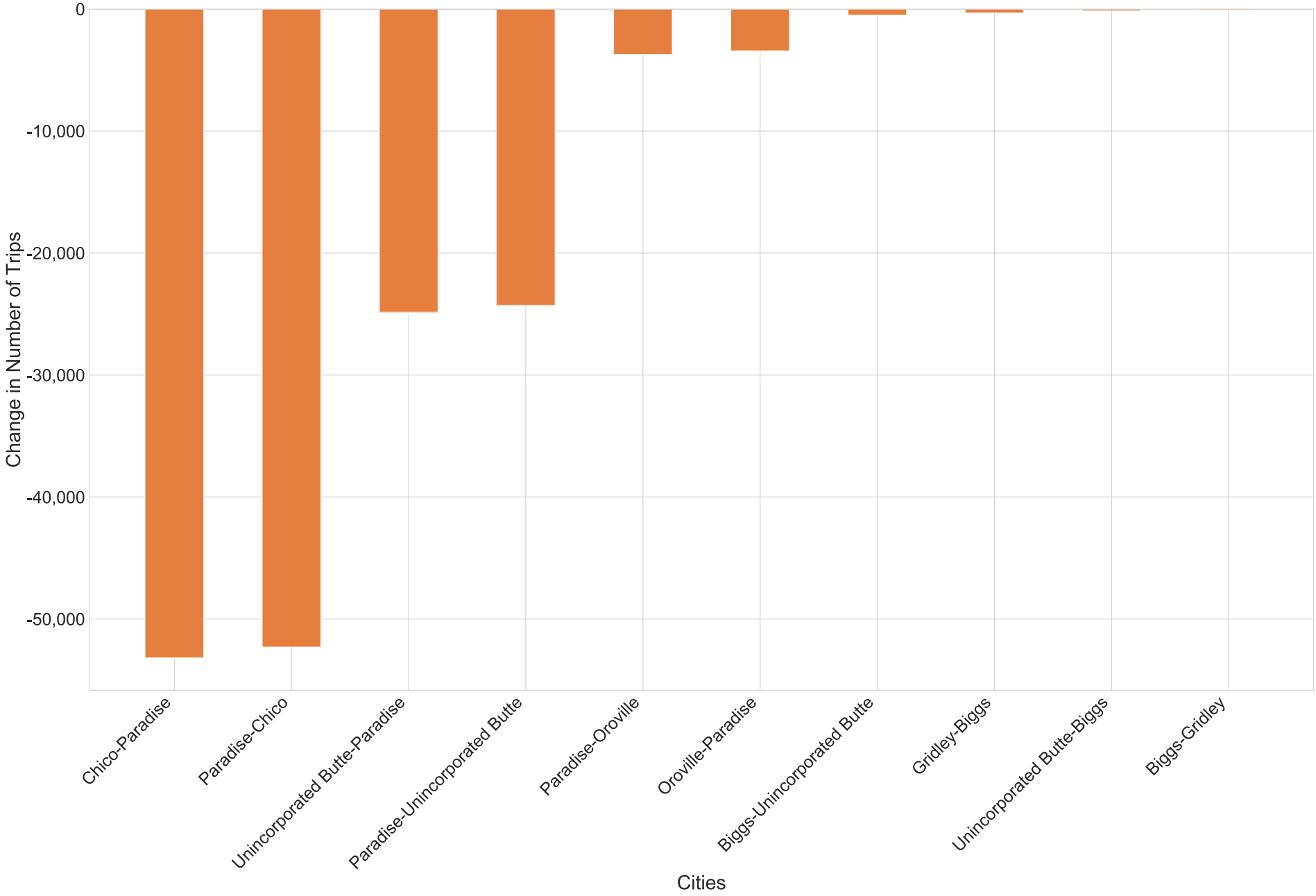


Chart 70: Family Migrations Leaving Butte County

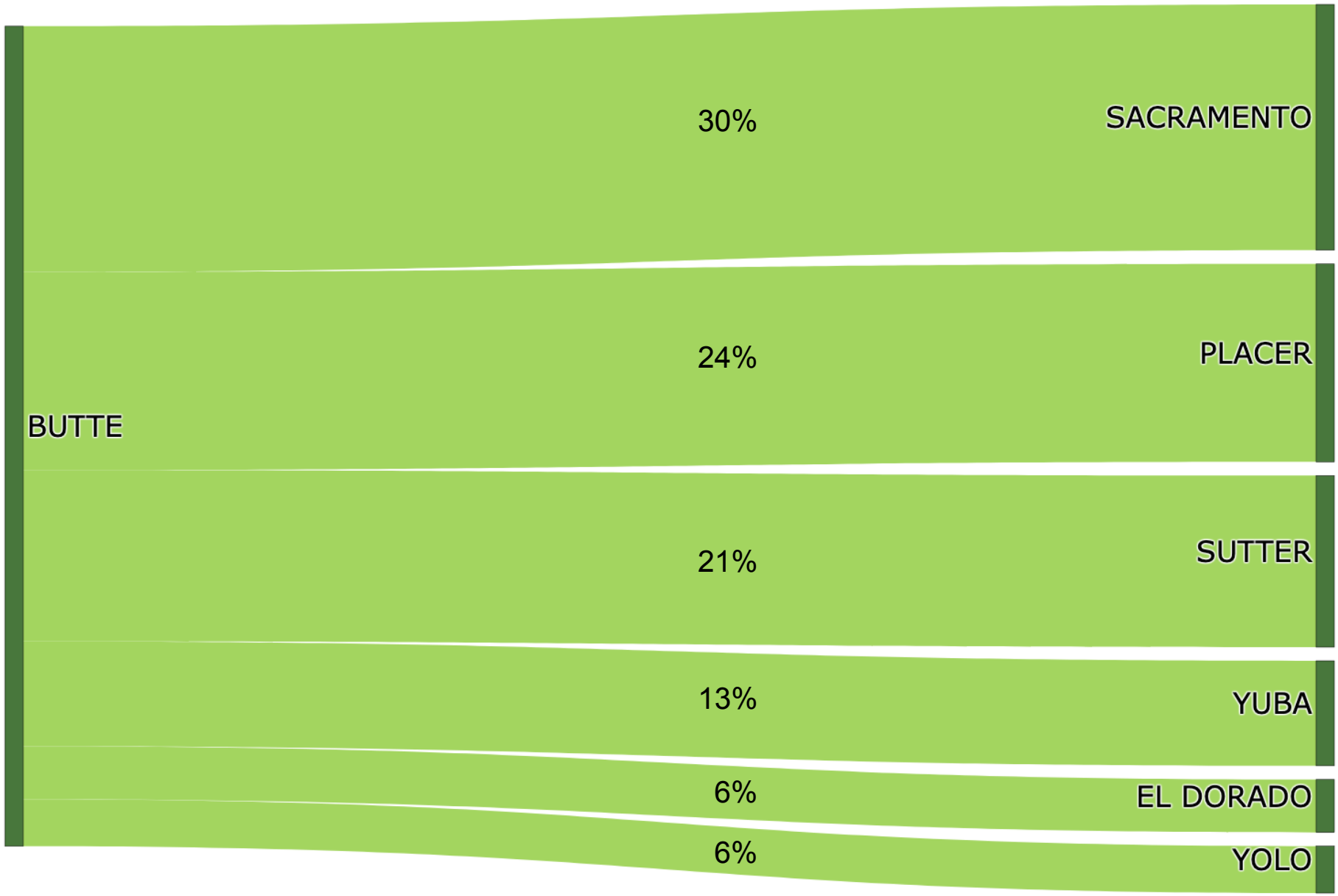


Chart 71: Family Migrations Leaving Paradise to Out of County

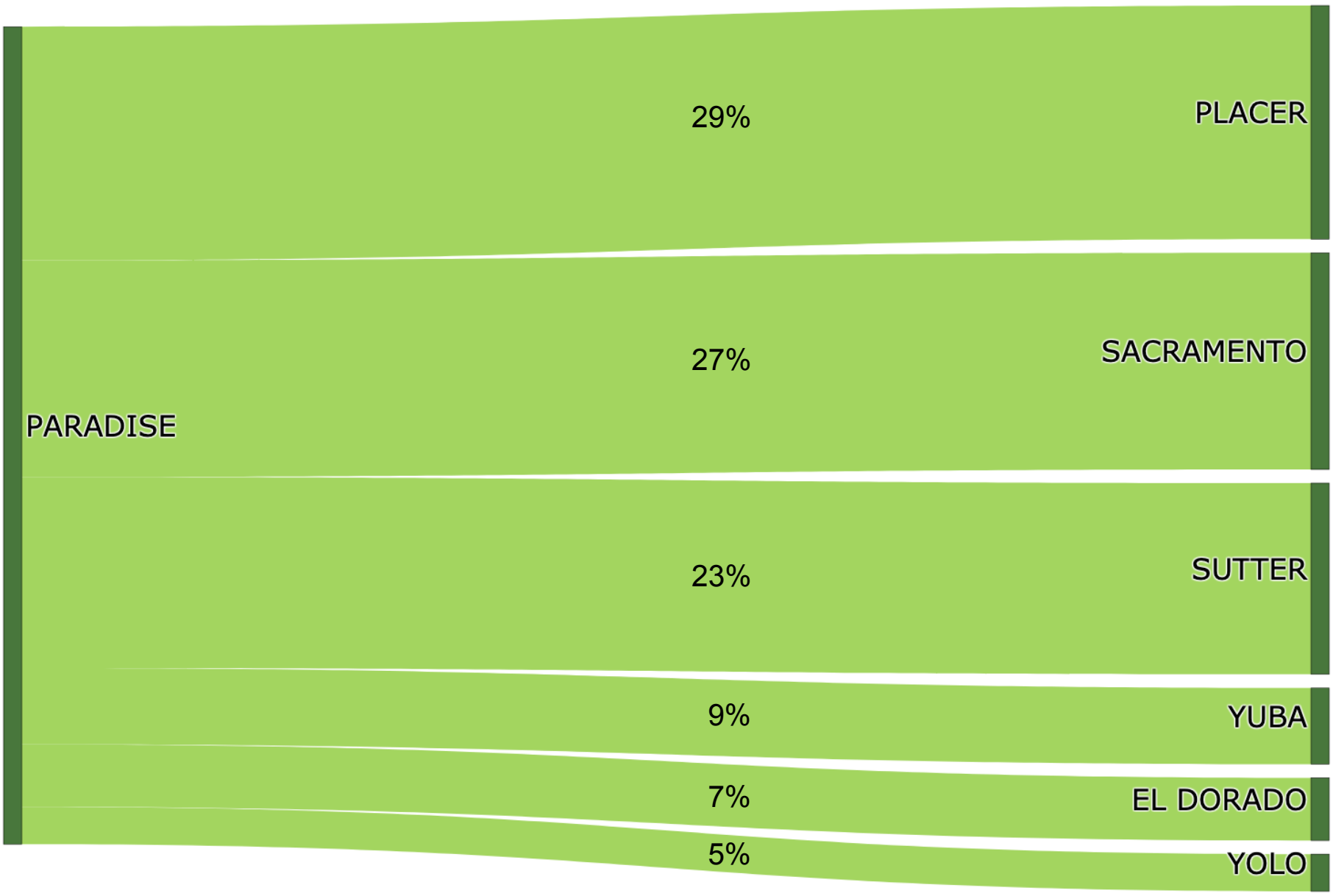


Chart 72: Distribution of New Residents in Butte County in 2019

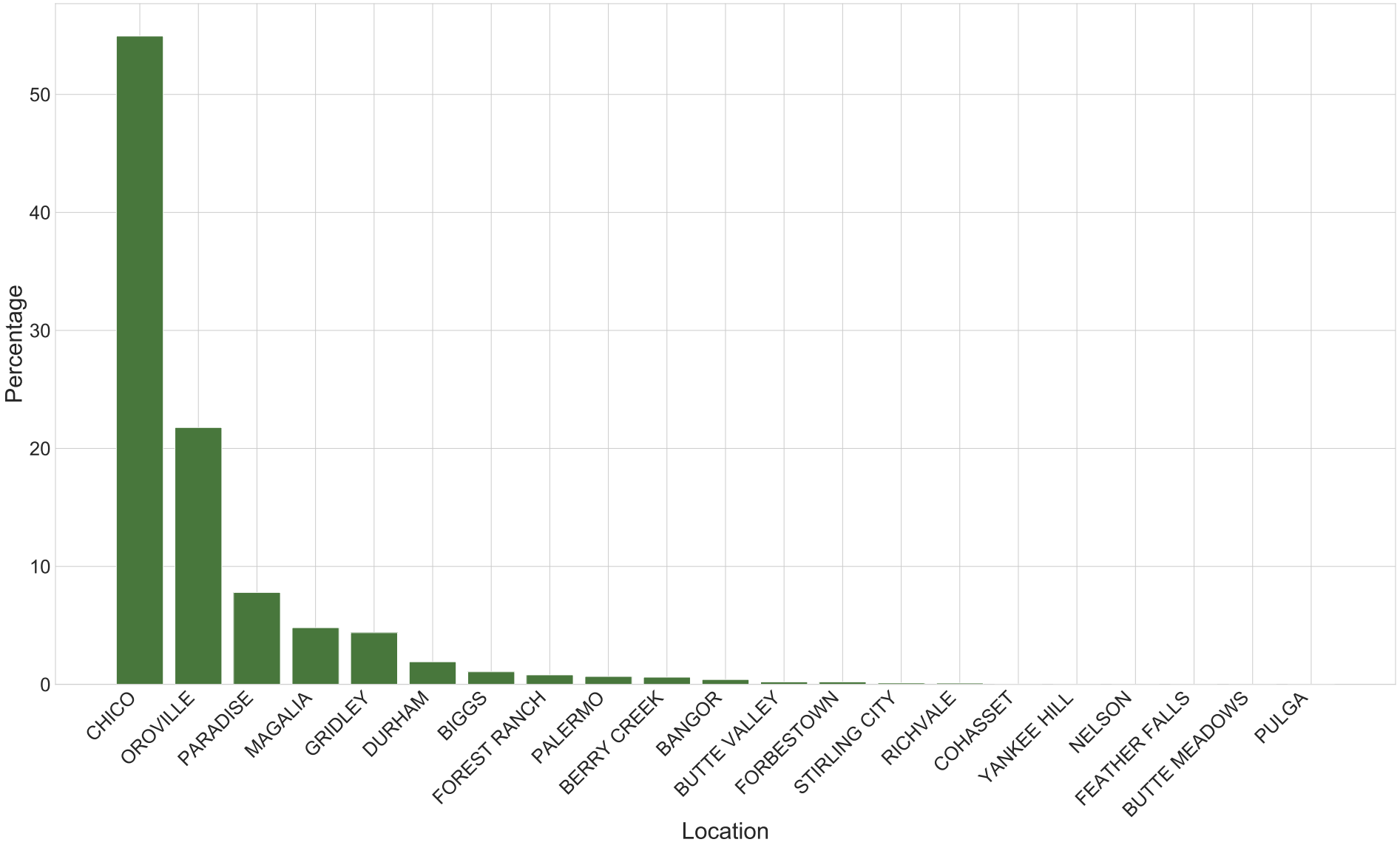


Chart 73: Length of Residence for Butte County Families

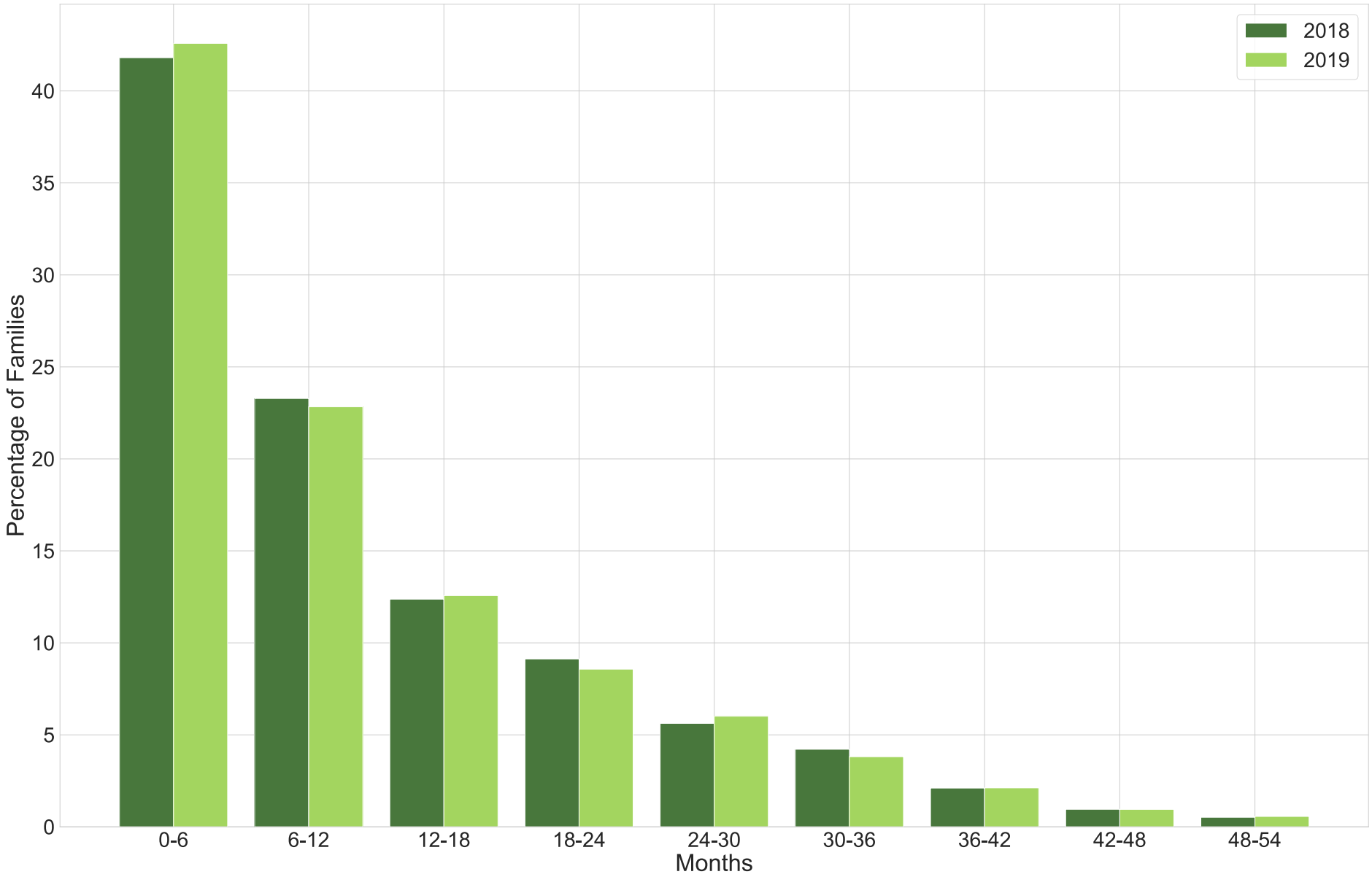


Chart 74: Estimated Value of Residence for Butte County Homes

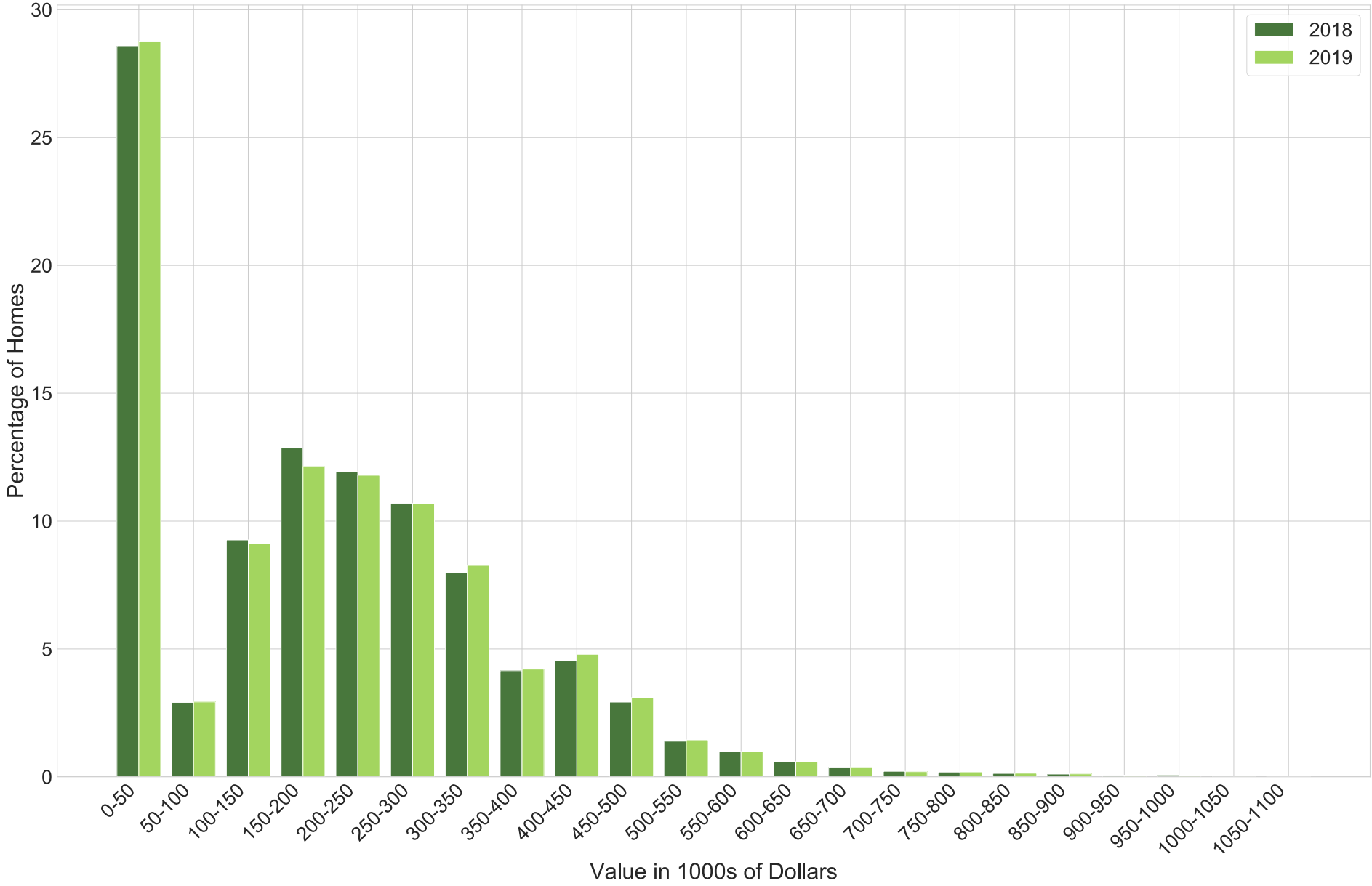


Chart 75: Construction Year of Butte County Homes

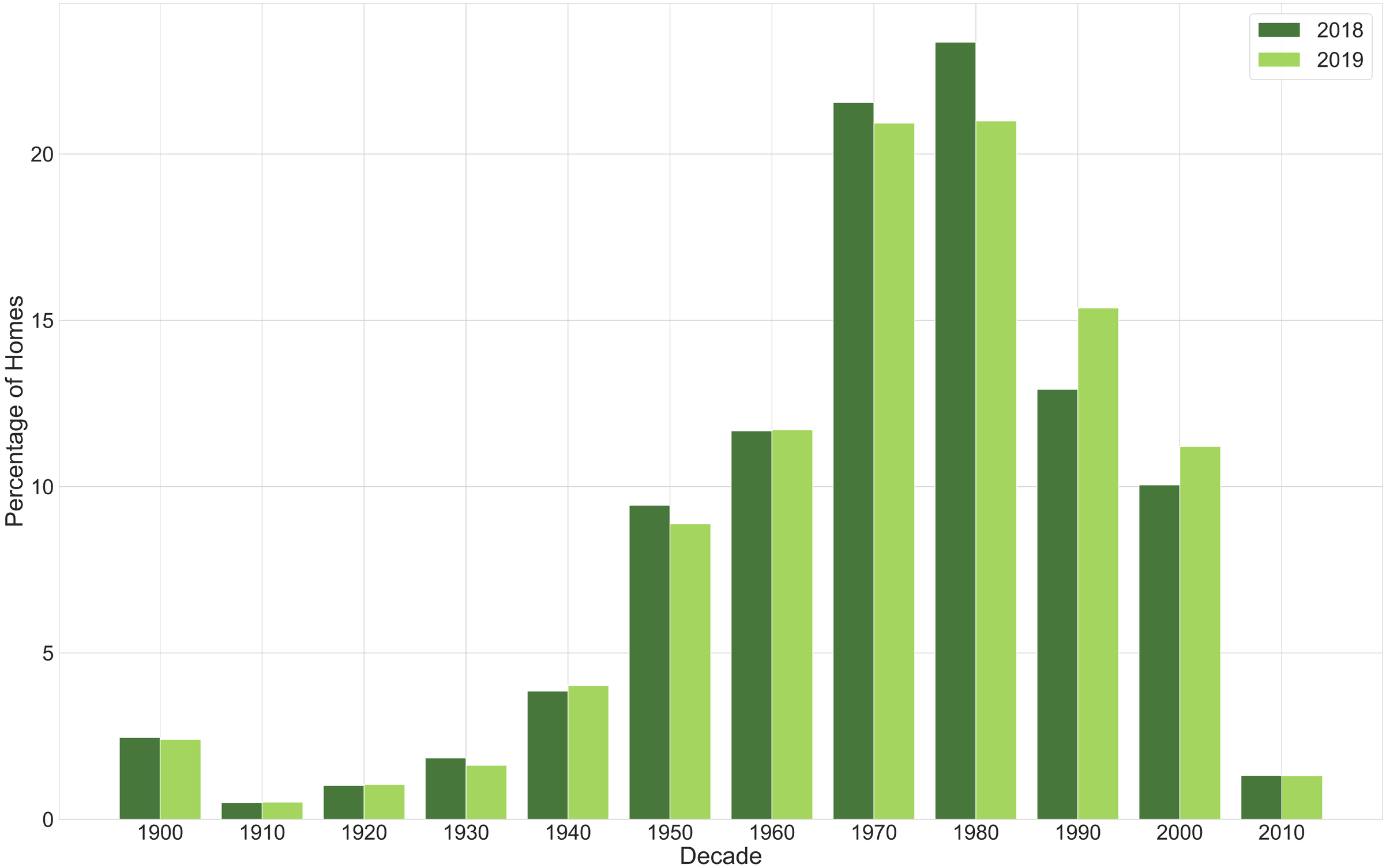


Chart 76: Home Ownership for Butte County Residences

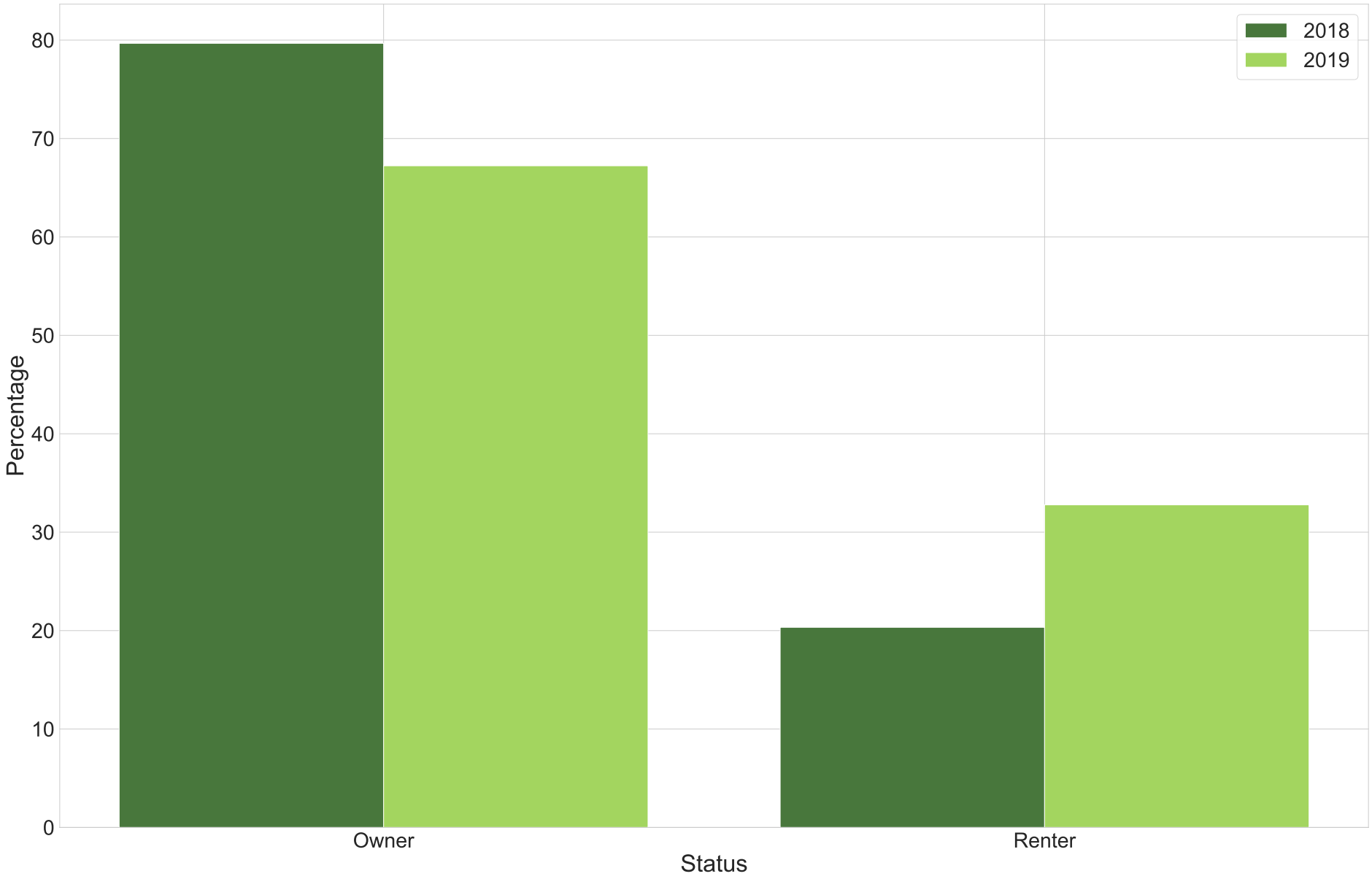


Chart 77: Household Size for Butte County Residences

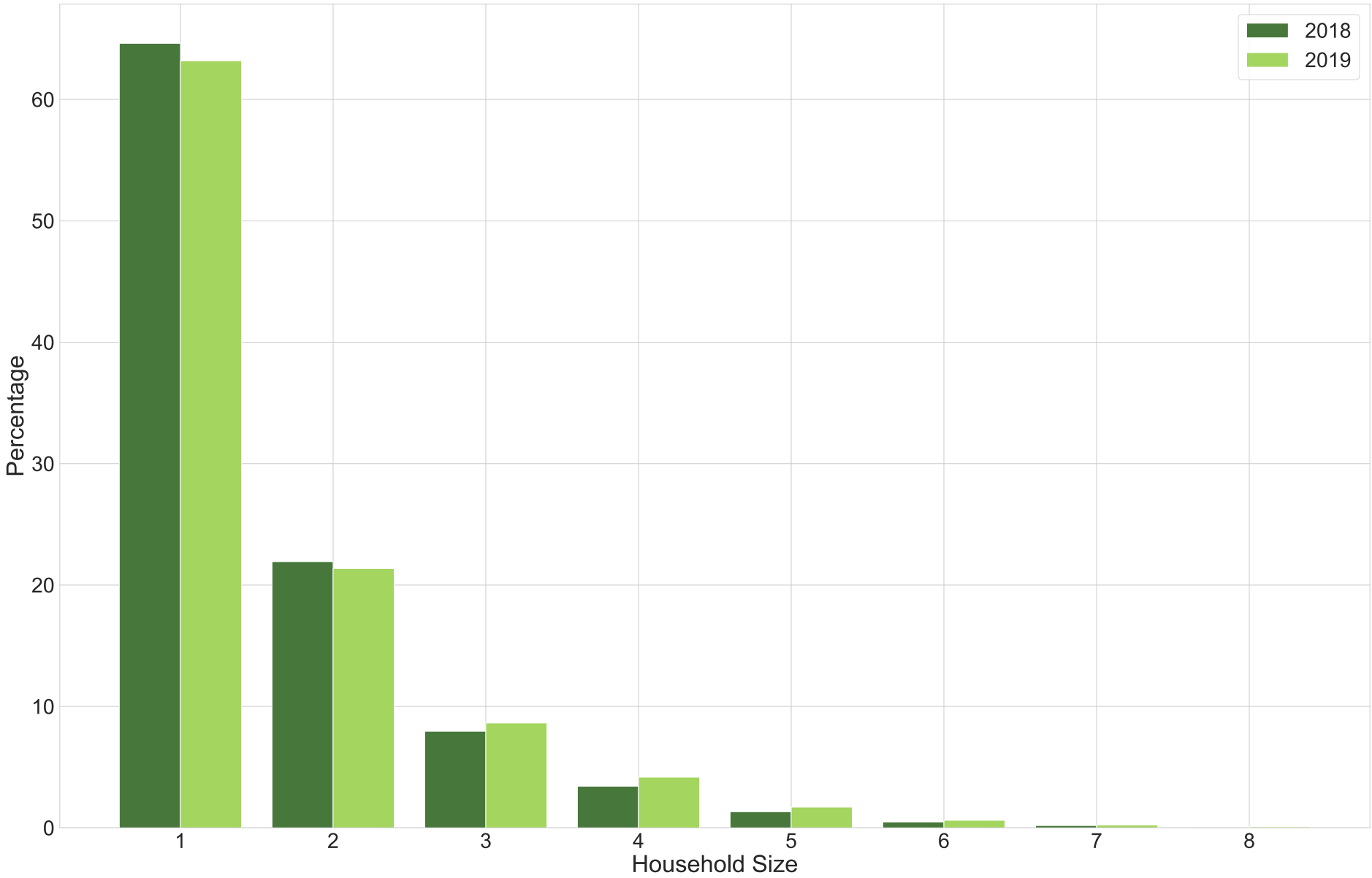


Chart 78: Businesses by Industry Type

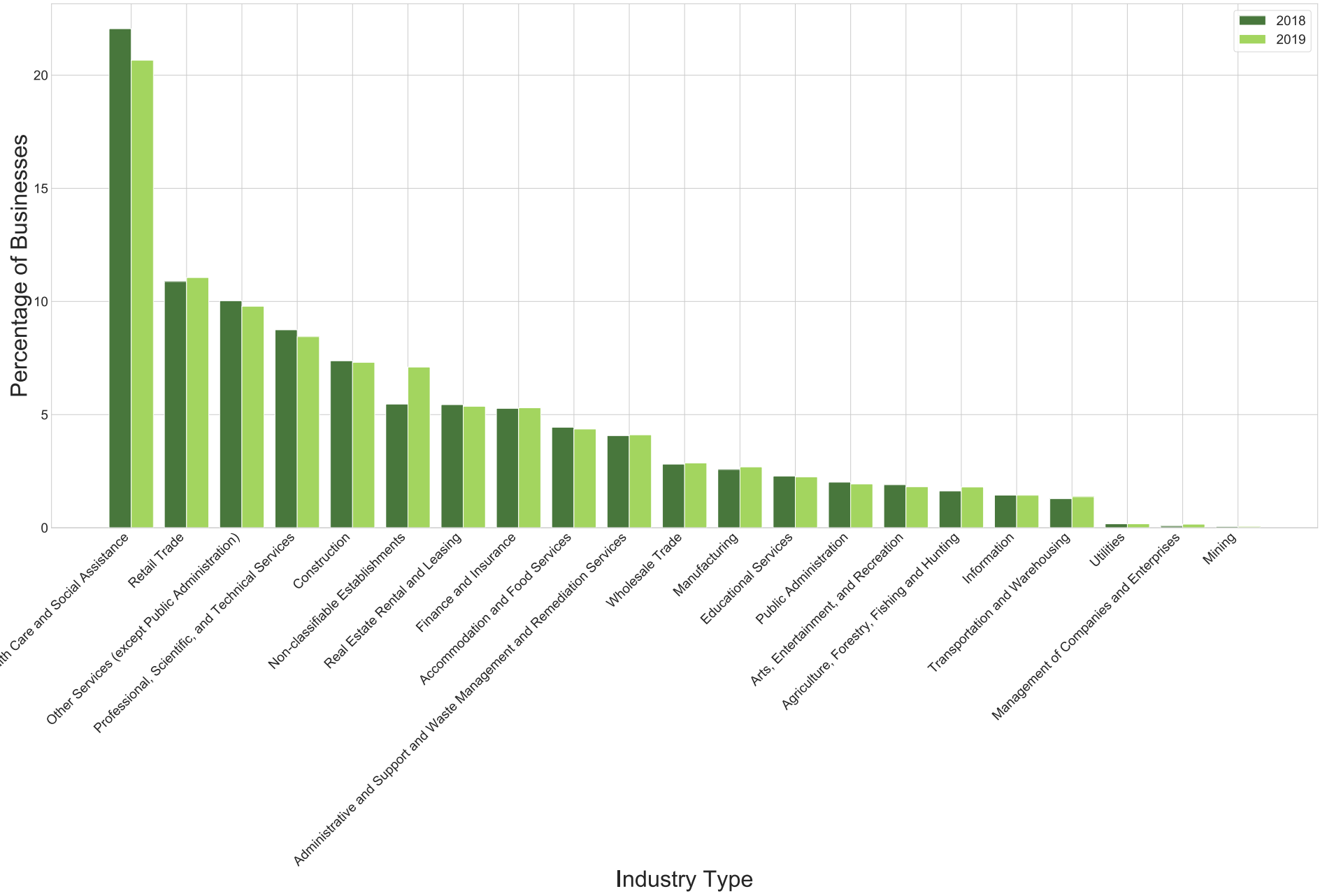


Chart 79: Businesses by Year Established

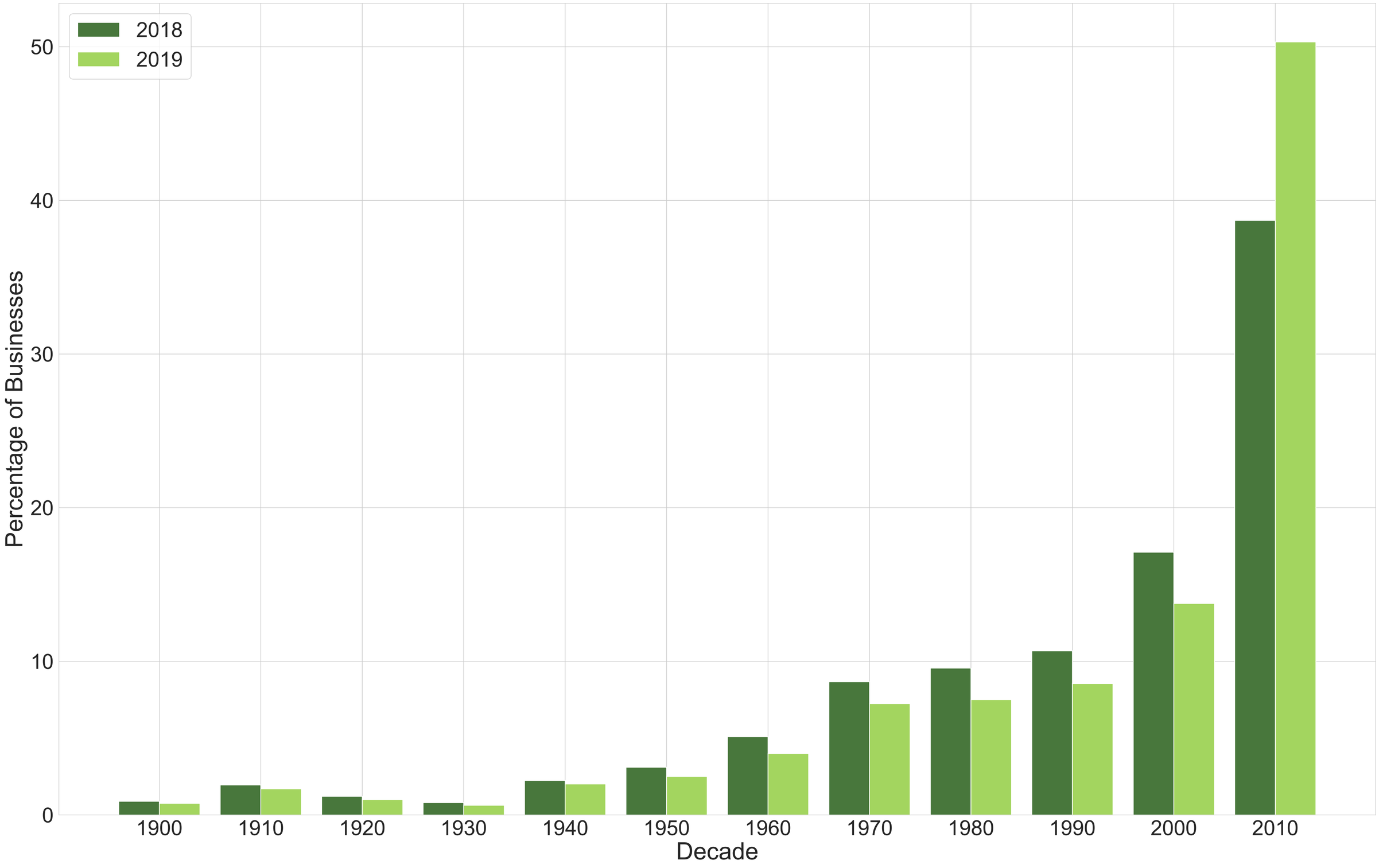


Chart 80: Businesses by Number of Employees

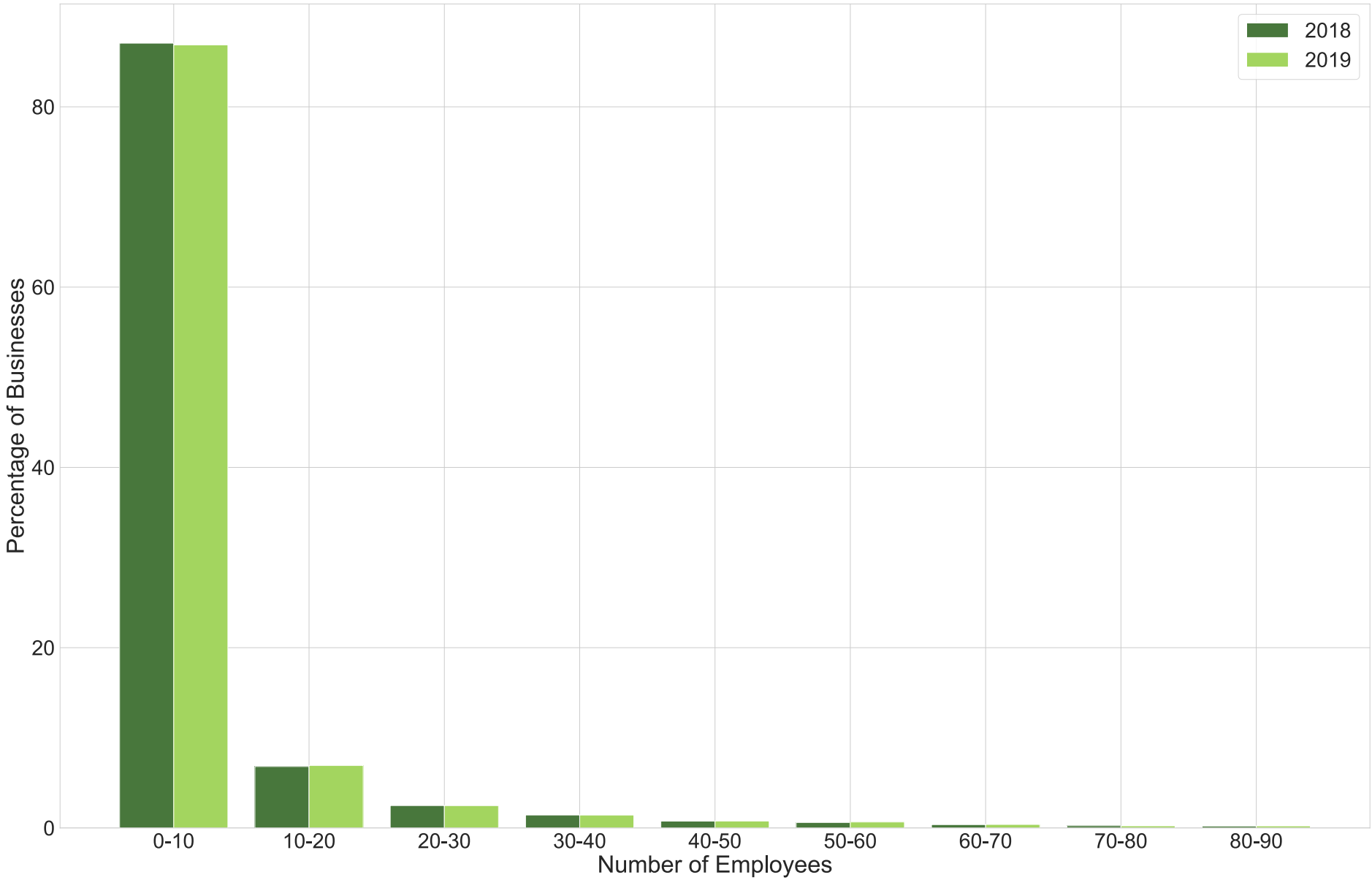


Chart 81: Businesses Lost in Butte County to Outside Counties

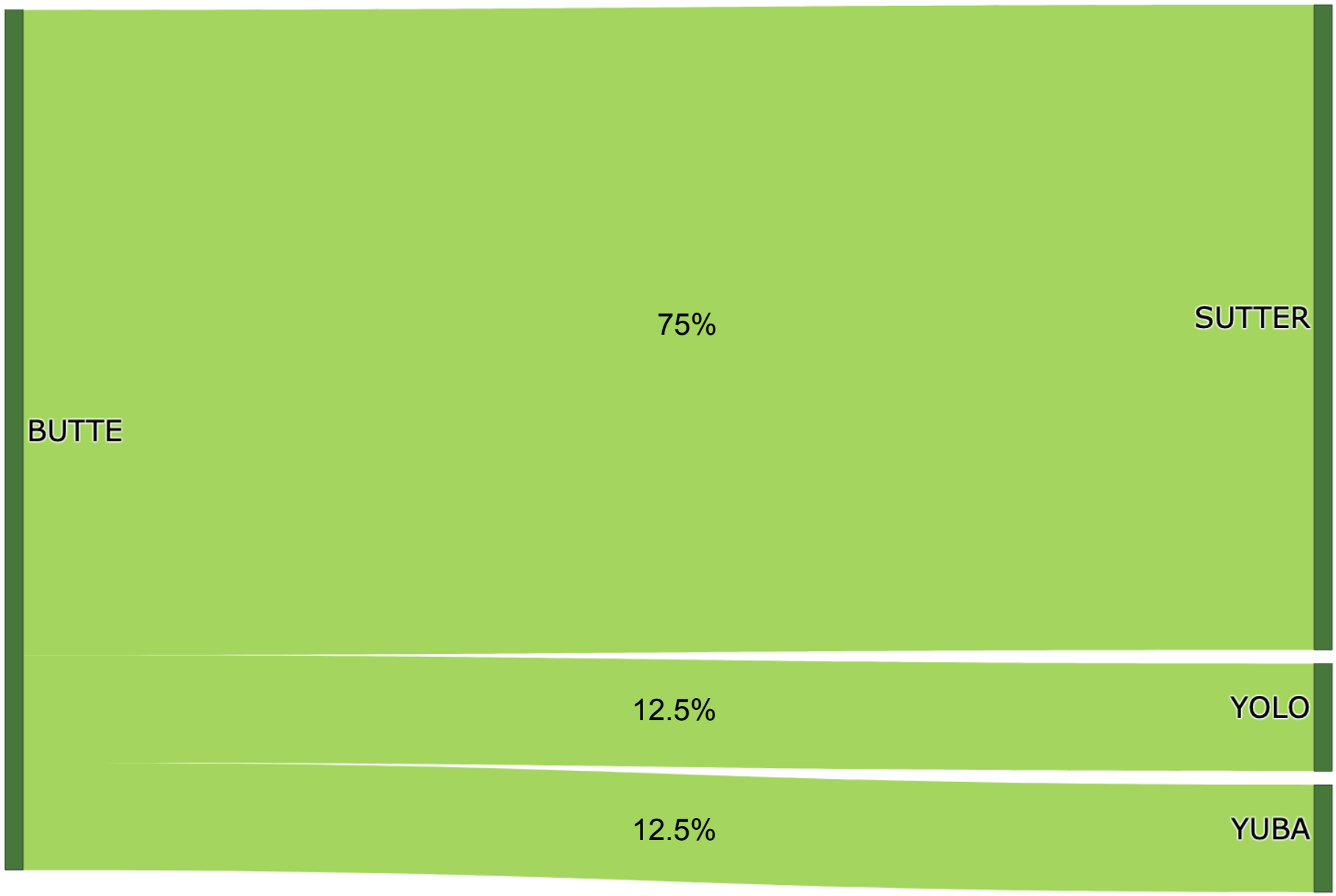


Chart 82: Businesses Lost in Paradise to Outside Counties

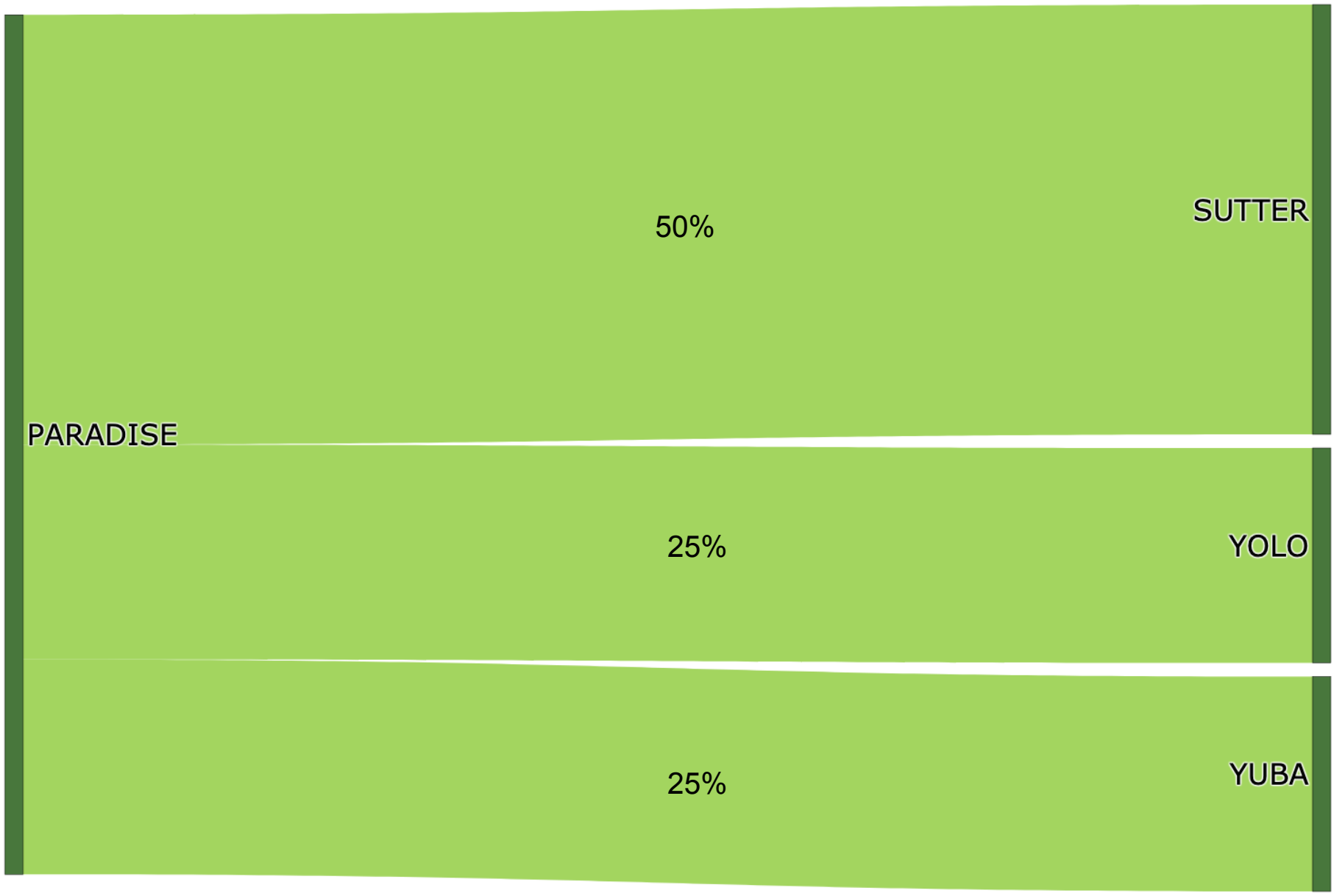
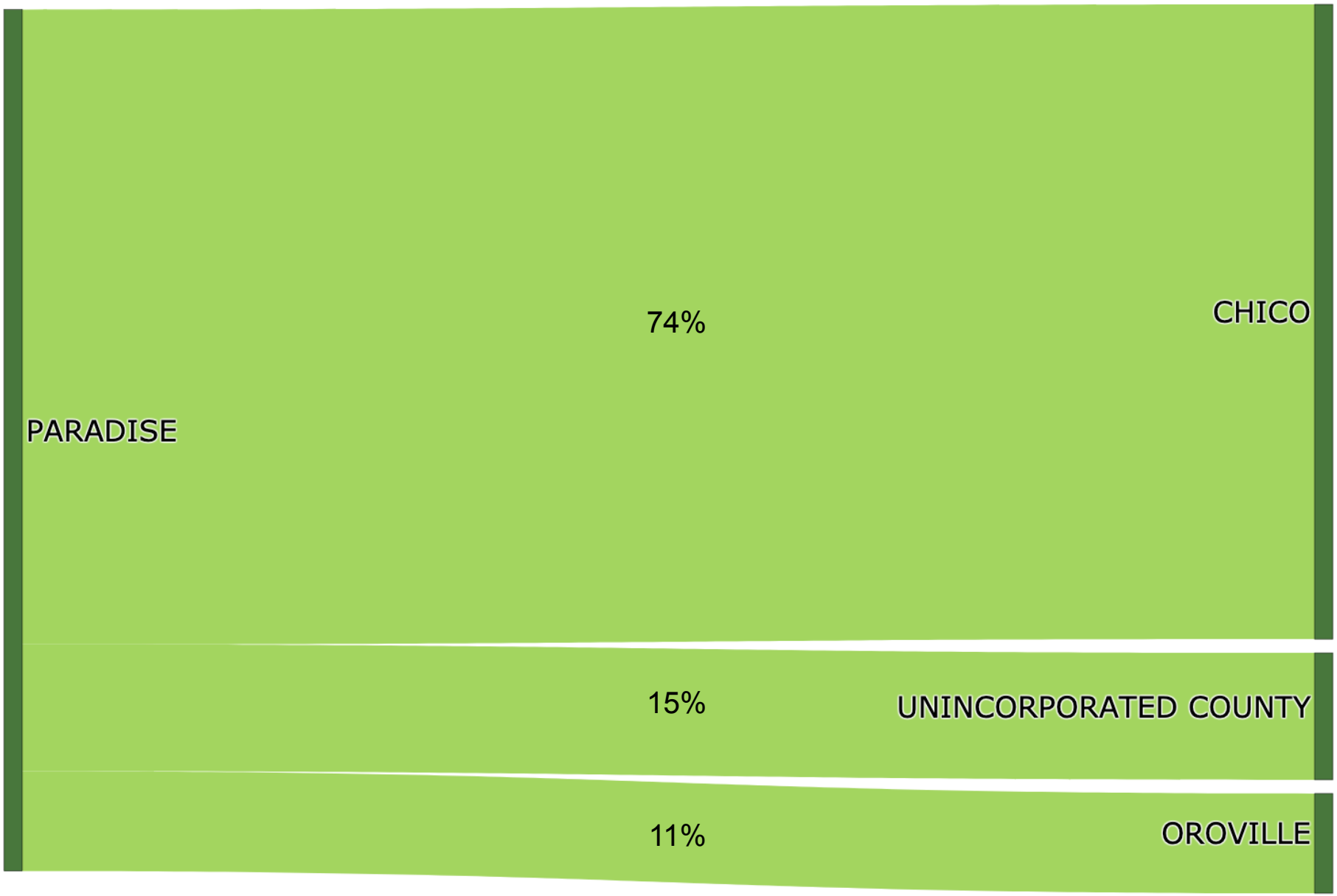


Chart 83: Businesses Lost in Leaving Paradise to Areas Within Butte County



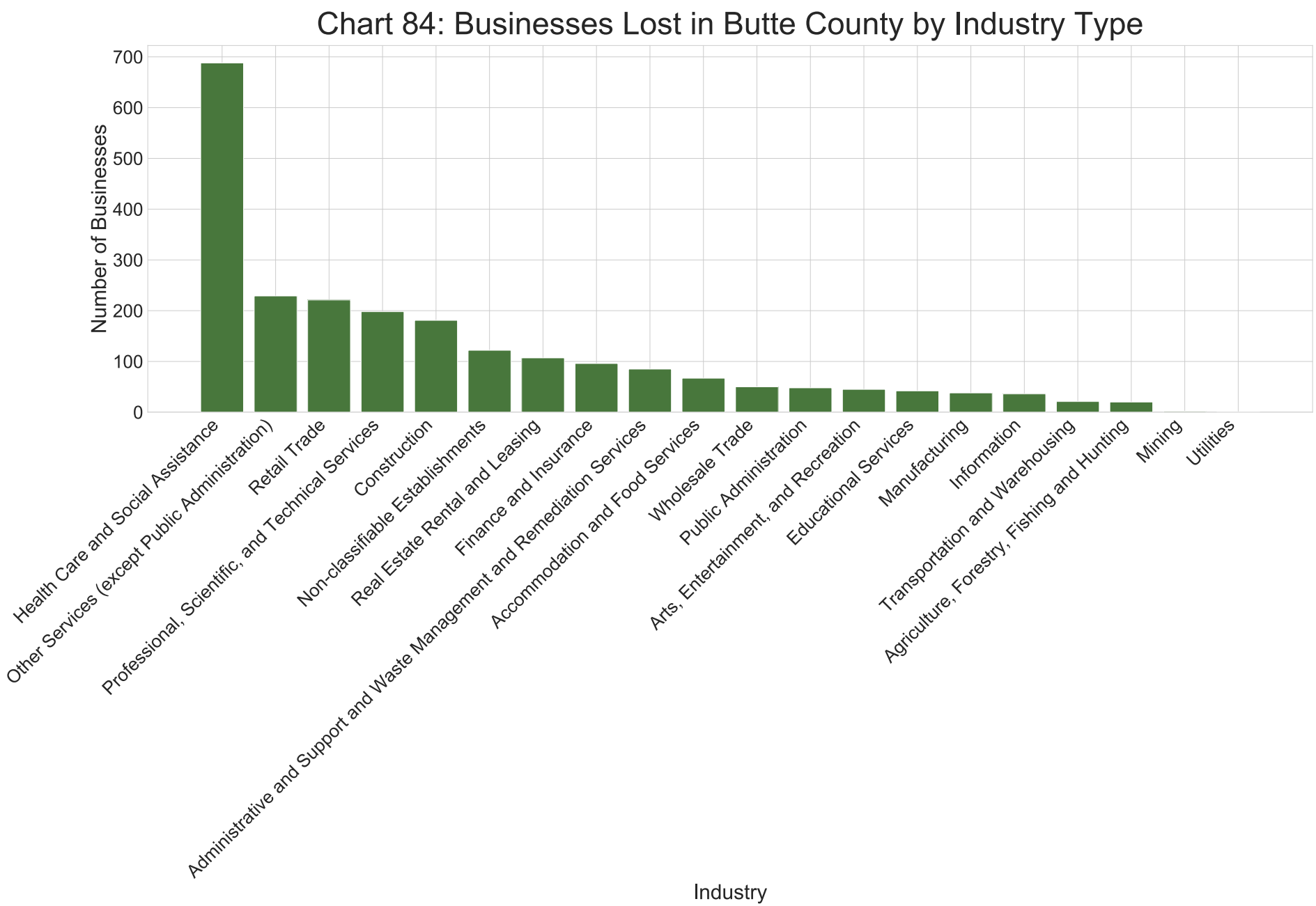


Chart 84: Businesses Lost in Butte County by Industry Type
Number of Businesses
0
100
200
300
400
500
600
700
Health Care and Social Assistance
Other Services (except Public Administration)
Retail Trade
Professional, Scientific, and Technical Services
Construction
Non-classifiable Establishments
Real Estate Rental and Leasing
Finance and Insurance
Administrative and Support and Waste Management and Remediation Services
Accommodation and Food Services
Wholesale Trade
Public Administration
Arts, Entertainment, and Recreation
Educational Services
Manufacturing
Information
Transportation and Warehousing
Agriculture, Forestry, Fishing and Hunting
Mining
Utilities
Industry

Chart 85: Businesses Lost in Butte County by Jurisdiction

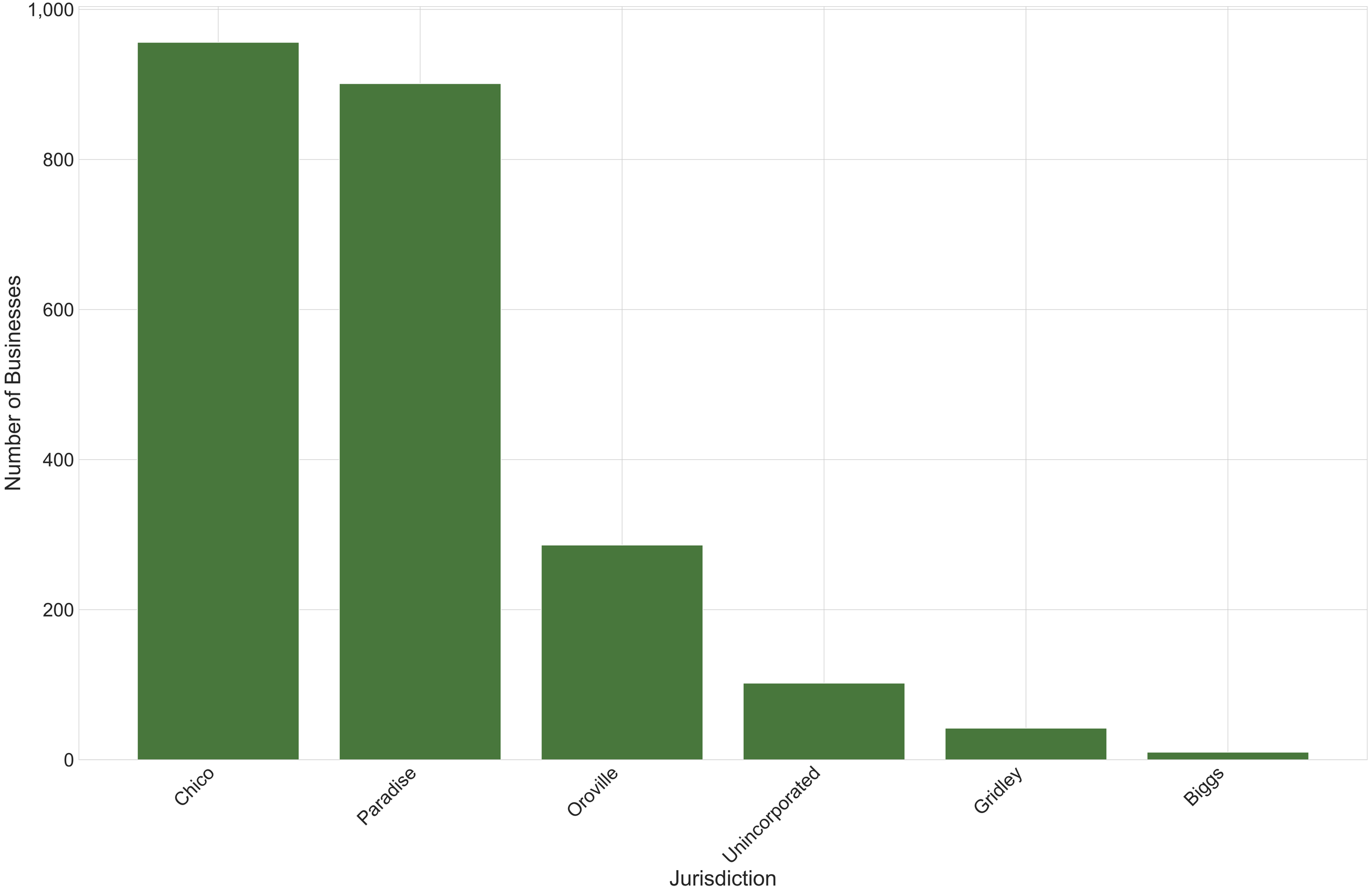


Chart 86: Businesses Lost in Paradise by Industry Type

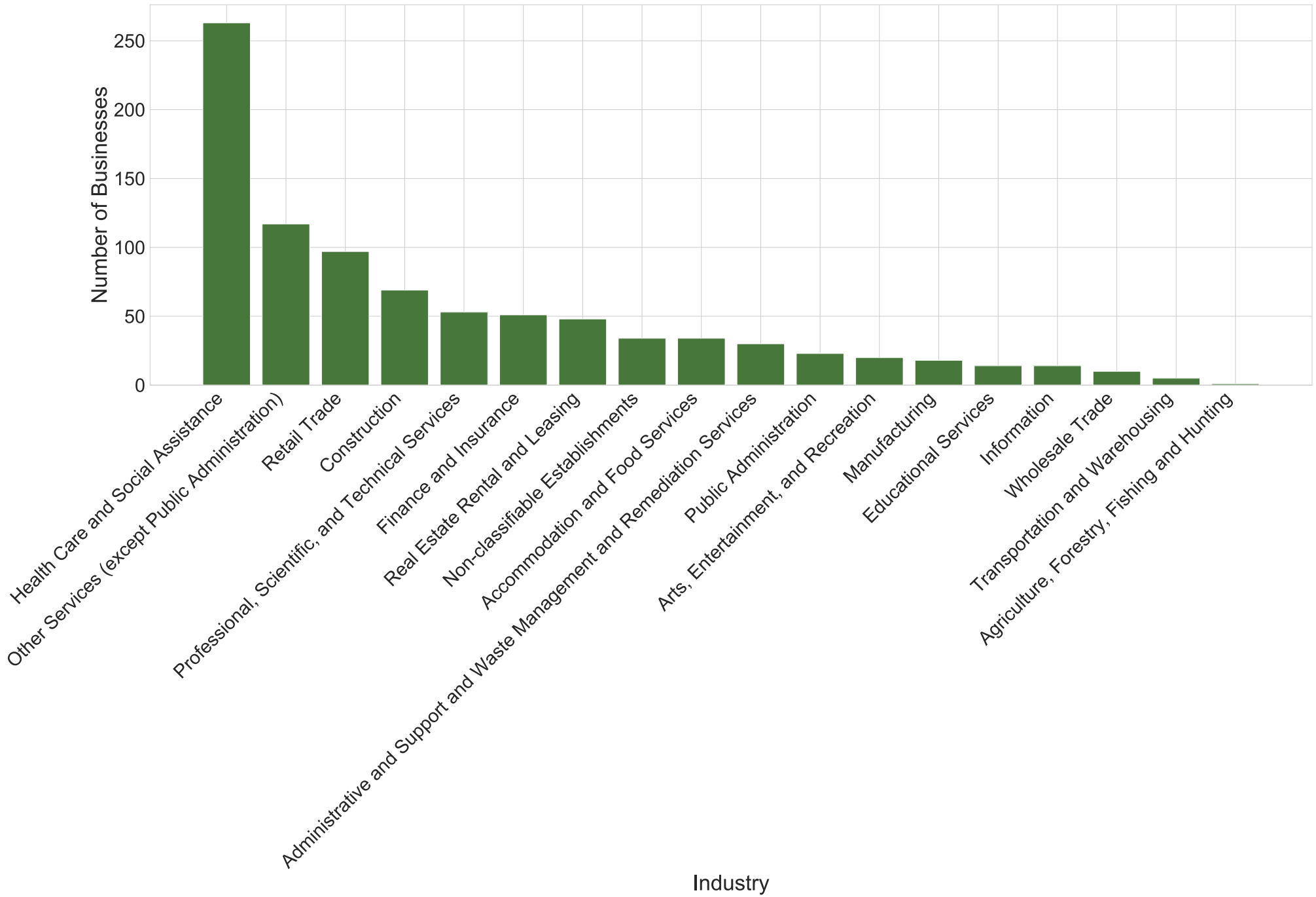


Chart 87: Businesses Lost in Paradise by Number of Employees

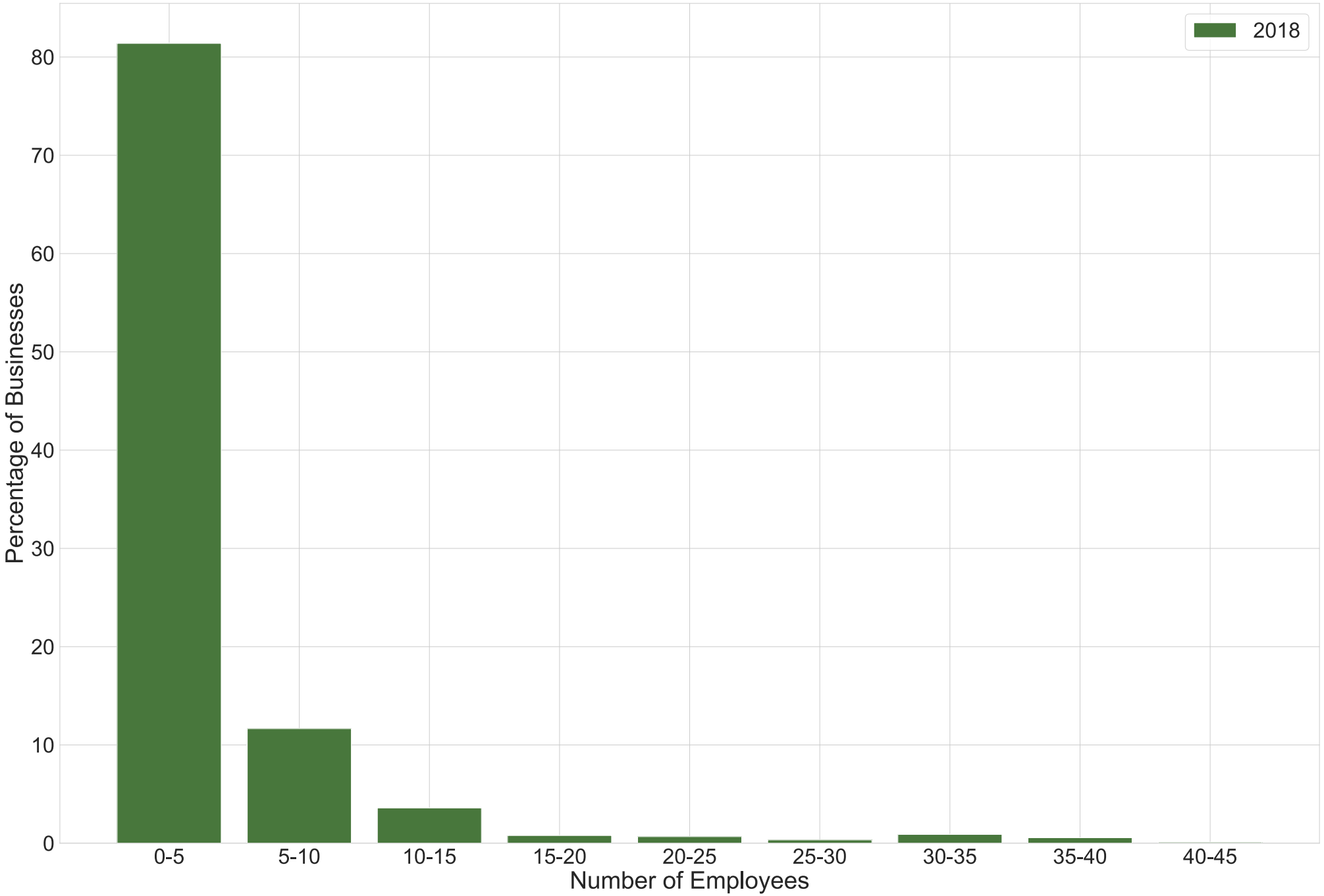


Chart 88: Businesses Established in 2019 by Jurisdiction

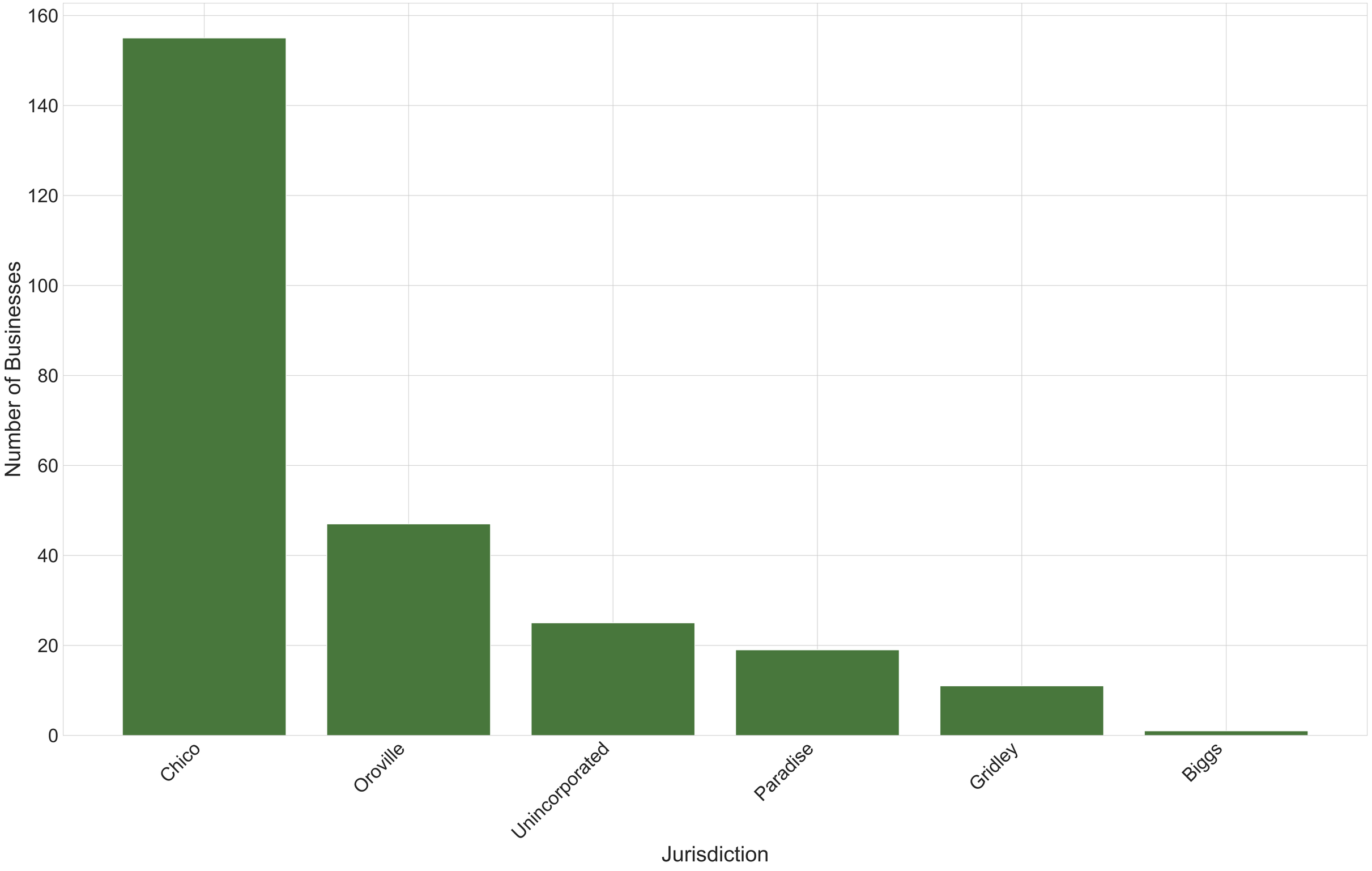


Chart 89: Businesses Established in 2019 by Industry

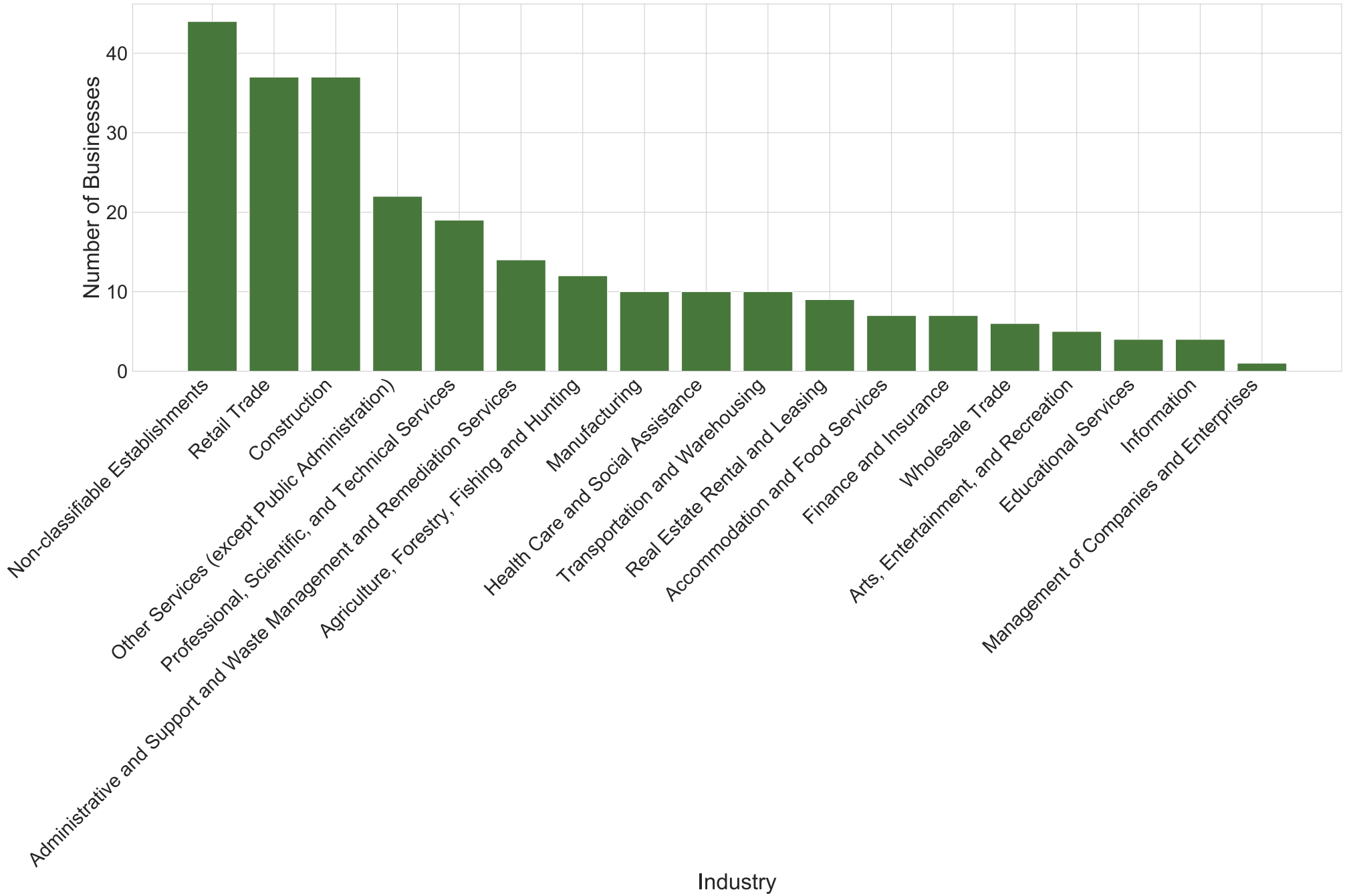
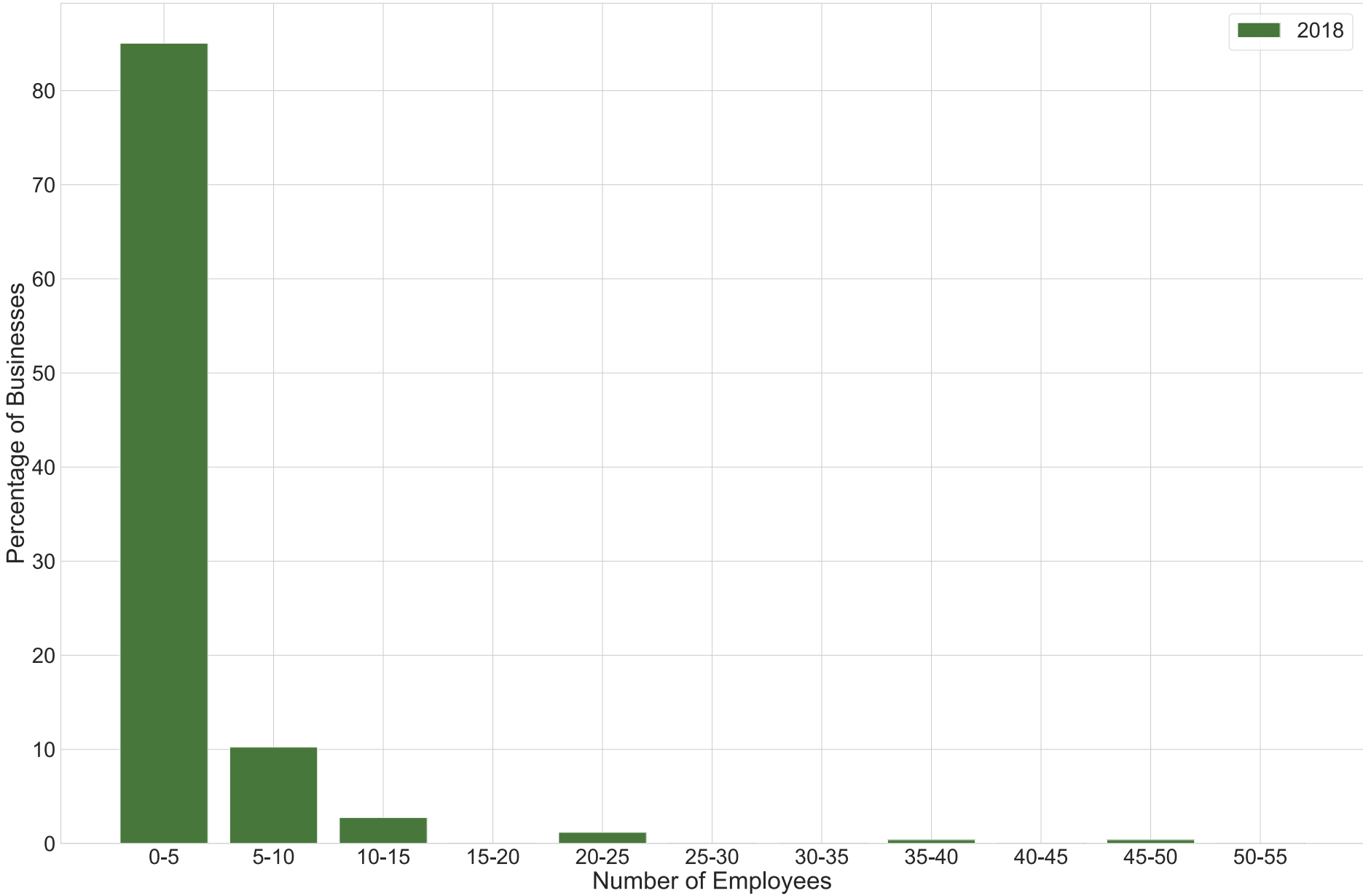


Chart 90: Businesses Established in 2019 by Number of Employees



Memorandum

Date: January 21, 2021

To: Sara Cain – Butte County Association of Governments

From: Tyler Boyle – The Collective
Mike Wallace – Fehr & Peers

Subject: Post Camp Fire Regional Growth Forecasts

RS19-3800

This memorandum describes the population, housing, and employment forecasts for 2025, 2035, and 2045. The information included in this memorandum will inform the update of the Butte County Transit and Non-Motorized Plan and subsequent updates of the Regional Transportation Plan and Sustainable Communities Strategy (RTP/SCS). These forecasts will be updated again prior to including in the 2024 RTP/SCS in order to reflect the latest estimates from the state, 2020 census information, and impacts from the 2020 North Complex Fire.

In summary, Butte County saw a nearly 8% decrease in estimated population, according to California Department of Finance projections released in May 2019 and May 2020. This emigration from the county caused population and housing forecasts to be depressed in comparison with the 2020 RTP/SCS. However, estimates indicate that the County will recoup this loss by the 2045 forecast year. Within the county, the distribution of housing will be changed for the long-term. With the extensive loss of housing in the Paradise and Magalia areas, and the shift in population focused to Chico, new housing growth rates in Chico will increase compared with the 2020 RTP/SCS. The Town of Paradise will see a period of elevated growth in the near term, and then begin to trend downward toward to pre-fire growth rates by 2045.

Population, Housing and Employment Forecasts

The purpose of these forecasts is to revise BCAG's provisional growth forecasts from the 2020 RTP/SCS and to update the long-term forecasts for informing the development of the 2024 RTP/SCS. These forecasts address the impacts to population, housing, and employment due to the Camp Fire, using current land use conditions, updated demographic estimates and current building trend data not available at the time of the 2020 RTP/SCS. These forecasts will be updated again prior to including in the 2024 RTP/SCS in order to reflect the latest estimates from the state, 2020 census information, and impacts from the 2020 North Complex Fire. See **Appendix A** for detailed land use allocations by jurisdiction, housing type, and job sector.

Approach

The growth forecasts presented in this document represent an update of the 2018-2025 forecasts developed during the 2019/2020 fiscal year. It includes a revised methodology that considers the latest California Department of Finance (DOF) population projections and estimates, California Employment Development Department (EDD) job estimates, past and present housing production by the local jurisdictions as well as the forecast projections from the 2020 RTP/SCS.

Using the new estimates and projections, coupled with new land use conditions developed for the end of year 2018 and end of year 2019, the baseline conditions from the 2020 RTP/SCS were adjusted. The forecasts were developed with similar methods to the 2020 RTP/SCS, but with the benefit of an additional year of information collected. One main difference between the 2020 RTP/SCS methodology and this forecast is the treatment of re-build assumptions. Rather than setting initial re-build percentage assumption, this forecast includes re-builds in the new growth forecasts, based on available data. Re-build totals were then calculated after the fact.

Housing

For the 2025-2045 forecast scenarios, we compared the forecasted growth from the 2020 RTP/SCS medium scenario with the updated DOF City/County Population and Housing Estimates, which now include 2020 (see **Table 1**). In comparison to the 2020 RTP, the DOF housing estimates show a decrease in population from 86,929 to 86,122 (0.9% decrease) in housing growth countywide, with Paradise and unincorporated areas seeing the largest decrease from 1,916 to 1,766 (7.8% decrease) and from 33,400 to 31,991 (a decrease of 4.4%) below 2020 RTP/SCS forecasts, respectively.

Likely causes for this gap include hazardous waste and debris removal efforts, lack of potable water and utilities, as well as ongoing tree removal efforts. Barriers such as debris removal, potable water and utilities were lifted in 2020, although tree removal efforts continue.

Overall, there is a reduction in the total county housing count for each of the forecast years when compared to the 2020 RTP/SCS. This is due in part to the revised population projections from the CA DOF for the county also seeing a reduction. However, housing trends do have projections returning the levels predicted in the 2020 RTP/SCS by the 2045-forecast year. In addition to the countywide reduction, Paradise is expected to have slower growth in both near and long-term forecasts, with Chico's growth making up the difference. The rapid increase in population in Chico, low vacancy and higher than normal persons per housing units are drivers for this increased growth. While some of this growth is temporary displacement from the Camp Fire, it is expected that some temporary growth will become permanent for residents who decide not to re-build and find permanent housing in Chico, another Butte County jurisdiction or elsewhere. Increased building costs and homeowners insurances costs are expected to influence the re-building efforts for low-income residents.

Based on historical housing estimates from the DOF and building permitting activity, the forecasted growth for the 2020 – 2025 period is on par with the highest growth periods in the county history.

Table 1: Housing Unit Forecast 2018 – 2045

2020 RTP/SCS Medium Scenario Benchmark

Jurisdiction	2018*	2020	2025	2030	2035	2040	2045	Total Increase 2018 - 2040	Percent Increase 2018 - 2040	CAGR 2018 - 2040
Biggs	692	718	790	853	903	948	*Not Forecasted*	256	37.0%	1.44%
Chico	39,810	40,689	43,168	45,314	47,018	48,574		8,764	22.0%	0.91%
Gridley	2,517	2,622	2,920	3,177	3,381	3,567		1,050	41.7%	1.60%
Oroville	7,333	7,524	8,062	8,528	8,898	9,236		1,903	26.0%	1.05%
Paradise	13,091	1,916	6,490	9,318	10,811	11,347		-1,744	-13.3%	-0.65%
Unincorporated	35,910	33,460	36,449	38,726	40,328	41,563		5,653	15.7%	0.67%
Total County	99,353	86,929	97,879	105,916	111,339	115,235		15,882	16.0%	**0.68%**

* DOF E-5 City/County Population and Housing Estimates (Updated May 2019)

Post Camp Fire Study 2018 – 2045 Forecast

Jurisdiction	2018**	2020**	2025	2030	2035	2040	2045	Total Increase 2018 - 2045	Percent Increase 2018 - 2045	CAGR 2018 - 2045
Biggs	692	696	729	776	830	891	936	244	35.3%	1.12%
Chico	39,810	41,738	44,651	47,495	50,497	53,718	56,106	16,296	40.9%	1.28%
Gridley	2,517	2,540	2,714	2,940	3,190	3,472	3,682	1,165	46.3%	1.42%
Oroville	7,333	7,391	7,657	8,035	8,455	8,936	9,293	1,960	26.7%	0.88%
Paradise	13,091	1,766	4,851	5,860	6,624	7,018	7,310	-5,781	-44.2%	-2.13%
Unincorporated	35,910	31,991	33,756	35,643	37,669	39,890	41,537	5,627	15.7%	0.54%
Total County	99,353	86,122	94,358	100,749	107,265	113,925	118,864	19,511	19.6%	**0.67%**

** DOF E-5 City/County Population and Housing Estimates (Updated May 2020)

The 2018 – 2045 forecast was reset to align with the latest DOF housing projections. First, the 2020 RTP/SCS forecast was scaled down by 0.9% (to be consistent with DOF) to set a new countywide housing forecast for 2025. Building permit activity for 2018, 2019 and 2020 was added to the existing 2000-2017 building permit activity to achieve new growth share percentages per jurisdiction. The 2020-year permit activity was incomplete at the time of collection. To generate the 2020-year total, the monthly average for the first half of 2020 was

extrapolated to arrive at the total for the year. See **Appendix B** for a detail table of annual permit activity for each jurisdiction.

The Town of Paradise sees its percentage of region change most significantly. In 2020, the Town has experienced record numbers of new residential permits. **Table 2** outlines updated assumptions for the share of regional growth based on building permits.

Table 2: Housing Assumptions

Share of Regional Growth

	A	B	C	D	E	F
Jurisdiction	**2018 Forecast (2020 RTP/SCS)**	**Building Permit History (2000 - 2019)**	**Building Permit Estimate for 2020**	**2025 Forecast**	**2035 Forecast**	**2045 Forecast**
Biggs	1.3%	0.5%	0.4%	0.4%	0.8%	0.9%
Chico	45.0%	51.7%	37.0%	35.4%	46.1%	48.4%
Gridley	5.4%	3.1%	2.2%	2.1%	3.8%	4.2%
Oroville	9.7%	4.7%	3.4%	3.2%	6.5%	7.2%
Paradise	5.6%	6.2%	35.0%	37.5%	11.7%	5.9%
Unincorporated	33.0%	33.7%	22.1%	21.4%	31.1%	33.3%
Total County	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

Housing assumptions are derived from building permit history (Appendix B) and are used to allocate forecasted growth to each jurisdiction. For example, in the 2025 forecast, its determined that 35.4% of housing growth in the county, will take place in Chico. In this study, a unique growth share was calculated for each forecast year. In comparison with the 2020 RTP/SCS, growth ratios are much higher in Paradise to account for the increased permitting activity associated with the Camp Fire. It is assumed that the greatest growth period will be during the 2025 forecast with growth ratio trending toward historical averages over the long-term forecasts.

The list below defines each column used in the Housing Assumptions (Table 2).

A. Share of regional growth used in BCAG's 2018-2040 Long-Term Regional Growth Forecasts.
B. Share of regional growth based on each jurisdiction's building permit history for the 2000-2019 period.
C. Share of regional growth estimated for 2020 based on monthly permitting reports to date.
D. Share of regional growth developed for 2025 Short-Term Regional Growth Forecasts. Formula (C + 25% increase in permits for Paradise).
E. Share of regional growth developed for 2045 Long-Term Regional Growth Forecasts. Formula (A*0.4)+(B*0.4)+(C*0.2)

F. Share of regional growth developed for 2035 Long-Term Regional Growth Forecasts. Formula (A*0.5)+(B*0.5)

Population

The 2018 – 2045 population forecast was also reset to align with the latest DOF projections (**Table 3**). Population forecasts were prepared by applying the 2020 average persons per housing units (PPHU) and historical average PPHU to each the housing unit forecasts. This method allows for the capture of variations in household size for each jurisdiction. Using the 2019 and 2020 DOF projections, we can capture post-Camp Fire PPHU numbers and adjust the population accordingly. This forecast then assumes PPHU will trend toward 2010 – 2018 average PPHU by 2045. See Table 4 for a details on the county PPHU assumptions.

Table 3: Population Forecast 2018 – 2045

2020 RTP/SCS Medium Scenario Benchmark

Jurisdiction	2018*	2020	2025	2030	2035	2040	2045	Total Increase 2018 - 2040	Percent Increase 2018 - 2040	CAGR 2018 - 2040
Biggs	1,894	2,123	2,230	2,354	2,477	2,595	*Not Forecasted*	701	37.0%	1.44%
Chico	92,861	111,892	107,593	107,712	110,301	113,303		20,442	22.0%	0.91%
Gridley	6,921	7,482	8,144	8,770	9,308	9,810		2,889	41.7%	1.60%
Oroville	18,091	22,102	21,342	21,466	22,086	22,785		4,694	25.9%	1.05%
Paradise	26,423	5,037	14,619	19,413	22,031	22,902		-3,521	-13.3%	-0.65%
Unincorporated	81,706	80,057	84,570	88,597	91,910	94,569		12,863	15.7%	0.67%
Total County	227,896	228,694	238,497	248,313	258,113	265,964		38,068	16.7%	**0.70%**

* DOF E-5 City/County Population and Housing Estimates (Updated May 2019)

Post Camp Fire Study 2018 – 2045 Forecast

Jurisdiction	2018**	2020**	2025	2030	2035	2040	2045	Total Increase 2018 - 2045	Percent Increase 2018 - 2045	CAGR 2018 - 2045
Biggs	1,985	1,852	2,041	2,196	2,303	2,444	2,565	580	29.2%	0.95%
Chico	92,286	110,326	111,921	111,513	115,374	119,963	123,520	31,234	33.8%	1.09%
Gridley	6,863	6,402	7,332	8,085	8,547	9,128	9,602	2,739	39.9%	1.25%
Oroville	17,896	19,440	19,621	20,052	20,550	21,457	22,524	4,628	25.9%	0.86%
Paradise	26,256	4,631	14,101	18,867	21,446	22,562	23,503	-2,753	-10.5%	-0.41%
Unincorporated	81,088	67,640	75,040	80,621	83,046	86,466	91,237	10,149	12.5%	0.44%
Total County	226,374	210,291	230,056	241,333	251,266	262,018	272,950	46,576	20.6%	**0.70%**

** DOF E-5 City/County Population and Housing Estimates (Updated May 2020)

As with the housing unit forest, the 2018 – 2045 population forecast was reset to align with the latest DOF population projections. First the 2020 RTP/SCS forecast was scaled down by 8% (to be consistent with DOF) to set a new countywide population forecast for 2020. The significant drop in countywide population in 2020 depressed each forecast year in comparison with the 2020 RTP/SCS. Countywide population is projected to rebound by the 2045 forecast resulting in no change to the Compounded Annual Growth Ratio (CAGR), which is 0.70% in both the 2020 RTP/SCS and 2018 – 2045 forecast. At the jurisdiction level, population growth shifts to Chico, with each of the jurisdictions seeing reduced growth rates. This can be partially attributed to the large population increase due to displaced residence from the Camp Fire, in addition to the 8% population decrease estimated by the DOF in 2020, which impacted Chico at a lower rate than all other jurisdictions.

Table 4. Population Assumptions 2018 – 2045

Persons per Housing Unit by Year

Jurisdiction	Average Persons Per Housing Unit							
	2018**	2019 **	2020**	2025	2030	2035	2040	2045
Biggs	2.87	2.95	2.66	2.69	2.71	2.74	2.76	2.82
Chico	2.32	2.72	2.64	2.61	2.52	2.40	2.32	2.31
Gridley	2.73	2.79	2.52	2.56	2.60	2.66	2.70	2.73
Oroville	2.44	2.90	2.63	2.60	2.52	2.49	2.46	2.44
Paradise	2.01	2.61	2.62	2.50	2.38	2.26	2.14	2.10
Unincorporated	2.26	2.35	2.11	2.15	2.18	2.21	2.22	2.23
Total County	2.28	2.59	2.44	2.44	2.40	2.34	2.30	2.30

** DOF E-5 City/County Population and Housing Estimates (Updated May 2020)

Person's per housing unit increases across all jurisdictions in 2019 due to displacement from the Camp Fire. By 2020, PPHU starts to decline but is still above 2018 level in all jurisdictions except for Biggs, Gridley and the unincorporated. This suggests that residents displaced by the Camp Fire who found temporary living arrangements in the more rural areas of the County, tended to find alternate housing accommodations more quickly than in other areas of the county. Interestingly, PPHU in these areas dropped below 2018 levels in 2020. This could suggest that impacts related to the Camp Fire caused residents in all parts of the county to emigrate.

Countywide Population Forecast Comparison to DOF Estimates

Pursuant to California Code §65584.01, the total regional population forecast for the projection year, used for the preparation of regional transportation planning, must be within +/- 1.5% of the Department of Finance population projections.

Year	CA DOF*	Study Forecast	Percent Difference
2025	230,003	230,056	0.02%
2030	239,784	241,333	0.65%
2035	249,929	251,266	0.52%
2040	260,890	262,018	0.43%
2045	272,199	272,950	0.28%

* California Department of Finance, January 2020, P-2 County Population Projections 2010-2060 (Baseline 2019)

Employment

Employment forecasts have been revised downward in comparison with the 2020 RTP/SCS. According to California Employment Development Department (CA EDD) annual average data, Butte County saw a reduction of 1,800 jobs between 2018 and 2019 (see **Table 5**). Similarly, data collected as part of the Task 4.2 Report of Pre and Post Camp Fire Conditions memorandum (September 2020) showed listed business addresses decreased by 18% between 2018 and 2019. Looking at current seasonally adjusted monthly totals published by CA EDD show a reduction in jobs in April 2020 due to COVID-19, down to 68,000. Between April and September of 2020, jobs began trending upward to 73,100. Assuming the current trend in employed continues and the effects of COVID-19 dissipate in 2021, we forecast a return to 2018 employment total by the 2025 forecast year. Long-term employment was determined by extrapolating Butte Counties historical (1990 – 2020) year over year employment trend (see **Table 6**).

Table 5: Employment Forecast 2018 - 2045

2018*	2019*	2020	2025	2030	2035	2040	2045
82,500	80,700	79,400	82,935	86,470	90,005	93,540	97,075

Table 6: Jobs (Non-Farm) to Housing Unit Ratios 2018 - 2045

2018*	2019*	2020	2025	2030	2035	2040	2045
0.83	0.99	0.92	0.88	0.86	0.84	0.82	0.82

* DOF E-5 City/County Population and Housing Estimates (Updated May 2020). California Employment Development Department, Industry Employment & Labor Force - by Annual Average, March 2020 Benchmark, for Butte County (Chico MSA).

Re-build Assumptions

Building permit data was again utilized to understand how much new growth could be attributed to rebuilding in the Camp Fire burn area (see **Appendix C**). For the Town of Paradise, we

examined residential building permits from 2019 and 2020. In reviewing these permits, we found that 97.4% of new permits in Paradise were toward re-build when compared against the current BCAG land use data by parcel.

Additionally, we looked at residential permitting activity from 2000 – 2018 compared with 2020. In Paradise, we found that the annual average residential permit activity from 2000 – 2018 compared with 2020 had increased by 91.2%. It is assumed the 91.2% increase represents re-build.

For the 2018 – 2045 forecast, we averaged these two figures to determine a 94.3% re-build rate. Since the unincorporated county permit data were not available, rebuild totals were developed using the data from Paradise as a proxy, a 94.3% re-build rate was assigned to the entire Camp Fire burn area. After new growth, allocations were applied and housing re-build totals were extracted (see **Table 7**).

Table 7: Camp Fire Re-Build Totals

Jurisdiction	Housing Unit Re-Builds		
	2025	2035	2045
Paradise	2,940	4,327	4,980
Unincorporated	558	1,415	2,417
Camp Fire Burn Area Total	3,498	5,742	7,397

Land Use Allocation

Data Preparation

General Plan

A standard list of general plan classification code values were developed for use in the model. Each of the jurisdiction's General Plan classifications was cross-walked into one of twenty standard modeling classifications (See Appendix A). This addressed any variations in general plans across the county, and allowed for the implementation of a single countywide general plan classification system. The purpose of the general plan modeling classifications is to restrict the type and location of new growth to designated areas when preparing the allocations.

Planning Areas

Planning area boundaries (see **Appendix D**) were created to define the extent of each jurisdiction, for planning purposes. The extents determine the areas in which a jurisdictions future growth allocation is accounted for. The Oroville planning area was further divided into an Oroville-City and Oroville-County due to the overlap in anticipated growth planned by both the City and County. Planning areas were adapted from a combination of jurisdiction city limits, Local Agency

Formation Commission (LAFCo) spheres of influence, general plan and special planning area considerations. Planning areas do not overlap one another and together they encompass the entirety of Butte County.

Growth Areas

Each jurisdiction was further broken down into Growth Areas. Jurisdiction plan areas were split into five Growth Areas; center, established, new, rural, and agricultural growth areas. Center growth areas are downtown and central business areas where higher densities of commercial LU's were present. Established growth areas are within the currently built environment. They represented areas where infill and redevelopment opportunities are present. New growth areas are where new development could occur outside of the currently established built environment. Rural and agricultural growth areas are only present in the unincorporated county jurisdiction and represented areas for new growth that are separated from any incorporated area in the county. Appendix H is included illustrating the locations of Growth Areas.

Masks

Masks (see **Appendix E**) are areas where new growth is not permitted or reasonably foreseeable to occur. Areas such as existing development, public parks, and protected lands are all examples of areas where growth is not permitted. Below is a full list of masks used in the development of the Butte County urban growth model.

Mask Layers
Public Park Lands
Existing Protected Lands
Existing Developed Lands
Lakes
Rivers
Existing Right of Ways
Areas of Slope > 25%
Public Lands
Federal Lands
Utility Lands (Includes PG&E, CalWater, AT&T)
State Lands
Union Pacific Lands
Proposed/Approved Development Areas

Available Lands

For each jurisdiction, an "available lands" layer (see **Appendix F**) was created by overlaying the General Plan with each jurisdiction's plan area and the mask layers. First, the land use layer was

overlaid with a chosen jurisdiction's plan area. All modeled land use classifications not inside the plan area were removed, leaving only model land uses specific to the plan area. The remaining area was then overlaid with all applicable mask layers. All modeled areas that intersected with a mask, were then removed. The final remaining area consists of all the "available lands" for new growth within the plan area. This process was repeated for each jurisdiction.

Land Use Assumptions

Land Use (LU) assumptions (see **Appendix G**) for regional and jurisdiction specific employment and housing characteristics were developed for each of the modeling classifications where new growth was assigned. These assumptions included metrics for the following:

- Dwelling units per acre (DU/AC): Density of homes for a specific residential or mixed-use land classification.
- Average square footage per employee (Avg. SF/E): Density of employees working in a business (Retail, Office, Industrial, or Mixed Use).
- Floor Area Ratio (FAR): Described as the relationship between the total useable floor space inside of a building(s) and the total area of the lot where building(s) are located.
- Mixed-use ratio: Mixed-use LU classifications receive a percentage of two or more different LU types (Residential, Retail, Office, and Industrial).

General Modeling Assumptions

- Due to the changes in the proportions of different land uses in the county due to the Camp Fire, it is assumed that new development will occur in proportions based on pre fire conditions, rather than the base year for development.
- The Camp Fire shifted a large proportion of Butte County population and housing from Paradise and Magalia into neighboring jurisdictions, primarily Chico. New growth forecasts assume that new growth will occur in a way that gradually restores pre-fire population and housing proportions.

Allocation Future Land Uses

Once data and inputs were prepared, allocation of new growth began. First, the existing land use conditions were summarized for both pre Camp Fire conditions and current conditions. Pre-fire conditions were derived from BCAG's 2018 Regional Land Use dataset, which captured conditions in Butte County as of October 2018. Current year conditions were derived from BCAG's 2019 Regional Land Use dataset, which captured conditions in Butte County as of December 31, 2019. Current year conditions were used as the base year for each forecast year.

Three forecast years were modeled, 2025, 2035 and 2045. Each forecast year starts with the population and housing figures developed above. The data from the available lands, based year conditions, and pre-fire land use development ratios are then imported into a spreadsheet based

allocation model for each jurisdiction, in addition the information on already planned development.

Growth Allocation Process

Allocation of forecasted development for each Growth Area was based regional population growth forecasts, current and proposed land use plans, and input from local jurisdictions. In the Town of Paradise, local building permit information was used to establish rate of recovery. Allocations were prepared for the region using the process of combining available lands growth and planned development at the jurisdictional level and output as and allocation spreadsheet.

The resulting output allocation spreadsheet was then allocated into specific parcels of the "available lands" GIS layer. Allocation spreadsheets outlined how much growth was to occur in each modeled land use classification per growth area. The growth was then distributed between all parcels of the particular land use classification based on the total percentage of development for that particular class. For example, if the High Density Residential (HDR) land use class was to receive a 40% allocation, all HDR areas received equal portions of that allocation based on parcel size. Final growth allocations are then summarized by Transportation Analysis Zone (TAZ) (see **Appendix H**) levels in GIS format.

Planned Projects Allocation

In the case of planned projects, or projects, which have been or are likely to be approved by local agencies and can reasonably be assumed to develop within the one of the forecast years. Details on the location and development is pre-determined. For these situations, growth was allocated into specified parcels, split by TAZ. For the purposes for this project, the same set of planned projects was assumed as used in the 2020 RTP/SCS, with some larger planned commercial developments in Paradise being removed. It is assumed that due to the reduced demand for services in Paradise, there planned commercial developments were no longer likely to occur.

Final Allocation Files

The resulting allocation (see **Appendix I**) for the new growth and planned projects for each forecast year were merged together into a single countywide shapefile with attributes containing the allocated growth for each sub area. Additionally, allocation of student enrollment is allocation to each TAZ where a school is present. These results are aggregated to the TAZ level, and adjusted for occupancy. This final output is incorporated into the travel demand model.

Table 1 Residential Structure Summary

BUTTE COUNTY TOTAL

YEAR	SF UNITS	MH UNITS	MF UNITS	TEMP UNITS	TOTAL RES UNITS	% SF Δ	% MH Δ	% MF Δ	% TOTAL Δ
2011	59,706	13,231	24,403	0	97,340	-	-	-	-
2012	59,820	13,259	24,473	0	97,552	0.19%	0.21%	0.29%	0.22%
2013	59,964	13,262	24,522	0	97,748	0.24%	0.02%	0.20%	0.20%
2014	60,431	13,270	24,921	0	98,622	0.78%	0.06%	1.63%	0.89%
2015	60,641	13,266	25,451	0	99,358	0.35%	-0.03%	2.13%	0.75%
2016	60,995	13,276	25,642	0	99,913	0.58%	0.08%	0.75%	0.56%
2017	61,334	13,255	26,041	0	100,630	0.56%	-0.16%	1.56%	0.72%
2018	52,164	9,484	24,836	0	86,484	-14.95%	-28.45%	-4.63%	-14.06%
2019	52,395	9,476	25,012	648	87,531	0.44%	-0.08%	0.71%	1.21%
				Pre Camp Fire Residential Growth	**2011 - 2017**	**2.73%**	**0.18%**	**6.71%**	**3.38%**
				Camp Fire Residential Loss	**2017 - 2018**	**-14.95%**	**-28.45%**	**-4.63%**	**-14.06%**
				Overall growth over time tracked	**2011 - 2019**	**-12.25%**	**-28.38%**	**2.50%**	**-10.08%**

BY JURISDICTION

	YEAR	SF UNITS	MH UNITS	MF UNITS	TEMP UNITS	TOTAL RES UNITS	% SF Δ	% MH Δ	% MF Δ	% TOTAL Δ
Biggs	2011	756	63	24	0	843	-	-	-	-
	2012	753	63	24	0	840	-0.40%	0.00%	0.00%	-0.36%
	2013	753	63	24	0	840	0.00%	0.00%	0.00%	0.00%
	2014	786	63	24	0	873	4.38%	0.00%	0.00%	3.93%
	2015	786	63	24	0	873	0.00%	0.00%	0.00%	0.00%
	2016	810	63	24	0	897	3.05%	0.00%	0.00%	2.75%
	2017	809	62	24	0	895	-0.12%	-1.59%	0.00%	-0.22%
	2018	812	60	24	0	896	0.37%	-3.23%	0.00%	0.11%
	2019	812	60	24	0	896	0.00%	0.00%	0.00%	0.00%
				Pre Camp Fire Residential Growth	**2011 - 2017**	**7.01%**	**-1.59%**	**0.00%**	**6.17%**
				Camp Fire Residential Loss	**2017 - 2018**	**0.37%**	**-3.23%**	**0.00%**	**0.11%**
				Overall growth over time tracked	**2011 - 2019**	**7.41%**	**-4.76%**	**0.00%**	**6.29%**

Table 1 Residential Structure Summary

	YEAR	SF UNITS	MH UNITS	MF UNITS	TEMP UNITS	TOTAL RES UNITS	% SF Δ	% MH Δ	% MF Δ	% TOTAL Δ
Chico	2011	21,363	1,922	17,993	0	41,278	-	-	-	-
	2012	21,452	1,926	18,064	0	41,442	0.42%	0.21%	0.39%	0.40%
	2013	21,546	1,925	18,064	0	41,535	0.44%	-0.05%	0.00%	0.22%
	2014	21,924	1,925	18,345	0	42,194	1.75%	0.00%	1.56%	1.59%
	2015	22,068	1,924	18,814	0	42,806	0.66%	-0.05%	2.56%	1.45%
	2016	22,308	1,924	18,986	0	43,218	1.09%	0.00%	0.91%	0.96%
	2017	22,644	1,922	19,358	0	43,924	1.51%	-0.10%	1.96%	1.63%
	2018	22,985	1,921	19,503	0	44,409	1.51%	-0.05%	0.75%	1.10%
	2019	23,161	1,898	19,733	87	44,879	0.77%	-1.20%	1.18%	1.06%
					Pre Camp Fire Residential Growth	**2011 - 2017**	**6.00%**	**0.00%**	**7.59%**	**6.41%**
					Camp Fire Residential Loss	**2017 - 2018**	**1.51%**	**-0.05%**	**0.75%**	**1.10%**
					Overall growth over time tracked	**2011 - 2019**	**8.42%**	**-1.25%**	**9.67%**	**8.72%**

	YEAR	SF UNITS	MH UNITS	MF UNITS	TEMP UNITS	TOTAL RES UNITS	% SF Δ	% MH Δ	% MF Δ	% TOTAL Δ
County	2011	13,299	3,784	262	0	17,345	-	-	-	-
	2012	13,310	3,805	262	0	17,377	0.08%	0.55%	0.00%	0.18%
	2013	13,337	3,816	262	0	17,415	0.20%	0.29%	0.00%	0.22%
	2014	13,358	3,820	262	0	17,440	0.16%	0.10%	0.00%	0.14%
	2015	13,378	3,820	262	0	17,460	0.15%	0.00%	0.00%	0.11%
	2016	13,406	3,823	262	0	17,491	0.21%	0.08%	0.00%	0.18%
	2017	13,380	3,808	262	0	17,450	-0.19%	-0.39%	0.00%	-0.23%
	2018	12,780	3,391	263	0	16,434	-4.48%	-10.95%	0.38%	-5.82%
	2019	12,755	3,403	263	102	16,523	-0.20%	0.35%	0.00%	0.54%
					Pre Camp Fire Residential Growth	**2011 - 2017**	**0.61%**	**0.63%**	**0.00%**	**0.61%**
					Camp Fire Residential Loss	**2017 - 2018**	**-4.48%**	**-10.95%**	**0.38%**	**-5.82%**
					Overall growth over time tracked	**2011 - 2019**	**-4.09%**	**-10.07%**	**0.38%**	**-4.74%**

Table 1 Residential Structure Summary

	YEAR	SF UNITS	MH UNITS	MF UNITS	TEMP UNITS	TOTAL RES UNITS	% SF Δ	% MH Δ	% MF Δ	% TOTAL Δ
Gridley	2011	2,055	146	429	0	2,630	-	-	-	-
	2012	2,056	146	429	0	2,631	0.05%	0.00%	0.00%	0.04%
	2013	2,061	146	429	0	2,636	0.24%	0.00%	0.00%	0.19%
	2014	2,077	146	425	0	2,648	0.78%	0.00%	-0.93%	0.46%
	2015	2,077	146	482	0	2,705	0.00%	0.00%	13.41%	2.15%
	2016	2,106	146	482	0	2,734	1.40%	0.00%	0.00%	1.07%
	2017	2,118	146	479	0	2,743	0.57%	0.00%	-0.62%	0.33%
	2018	2,130	146	479	0	2,755	0.57%	0.00%	0.00%	0.44%
	2019	2,135	146	479	0	2,760	0.23%	0.00%	0.00%	0.18%
					Pre Camp Fire Residential Growth	**2011 - 2017**	**3.07%**	**0.00%**	**11.66%**	**4.30%**
					Camp Fire Residential Loss	**2017 - 2018**	**0.57%**	**0.00%**	**0.00%**	**0.44%**
					Overall growth over time tracked	**2011 - 2019**	**3.89%**	**0.00%**	**11.66%**	**4.94%**

	YEAR	SF UNITS	MH UNITS	MF UNITS	TEMP UNITS	TOTAL RES UNITS	% SF Δ	% MH Δ	% MF Δ	% TOTAL Δ
Magalia	2011	2,838	2,345	27	0	5,210	-	-	-	-
	2012	2,839	2,346	27	0	5,212	0.04%	0.04%	0.00%	0.04%
	2013	2,841	2,345	27	0	5,213	0.07%	-0.04%	0.00%	0.02%
	2014	2,841	2,346	27	0	5,214	0.00%	0.04%	0.00%	0.02%
	2015	2,841	2,346	27	0	5,214	0.00%	0.00%	0.00%	0.00%
	2016	2,841	2,345	27	0	5,213	0.00%	-0.04%	0.00%	-0.02%
	2017	2,839	2,341	27	0	5,207	-0.07%	-0.17%	0.00%	-0.12%
	2018	1,674	1,441	21	0	3,136	-41.04%	-38.45%	-22.22%	-39.77%
	2019	1,670	1,449	21	39	3,179	-0.24%	0.56%	0.00%	1.37%
					Pre Camp Fire Residential Growth	**2011 - 2017**	**0.04%**	**-0.17%**	**0.00%**	**-0.06%**
					Camp Fire Residential Loss	**2017 - 2018**	**-41.04%**	**-38.45%**	**-22.22%**	**-39.77%**
					Overall growth over time tracked	**2011 - 2019**	**-41.16%**	**-38.21%**	**-22.22%**	**-38.98%**

Table 1 Residential Structure Summary

	YEAR	SF UNITS	MH UNITS	MF UNITS	TEMP UNITS	TOTAL RES UNITS	% SF Δ	% MH Δ	% MF Δ	% TOTAL Δ
Oroville	2011	8,368	1,153	3,758	0	13,279	-	-	-	-
	2012	8,381	1,155	3,757	0	13,293	0.16%	0.17%	-0.03%	0.11%
	2013	8,383	1,156	3,806	0	13,345	0.02%	0.09%	1.30%	0.39%
	2014	8,393	1,158	3,880	0	13,431	0.12%	0.17%	1.94%	0.64%
	2015	8,431	1,158	3,851	0	13,440	0.45%	0.00%	-0.75%	0.07%
	2016	8,451	1,160	3,870	0	13,481	0.24%	0.17%	0.49%	0.31%
	2017	8,462	1,161	3,900	0	13,523	0.13%	0.09%	0.78%	0.31%
	2018	8,465	1,166	3,906	0	13,537	0.04%	0.43%	0.15%	0.10%
	2019	8,513	1,166	3,906	44	13,629	0.57%	0.00%	0.00%	0.68%
					Pre Camp Fire Residential Growth	**2011 - 2017**	**1.12%**	**0.69%**	**3.78%**	**1.84%**
					Camp Fire Residential Loss	**2017 - 2018**	**0.04%**	**0.43%**	**0.15%**	**0.10%**
					Overall growth over time tracked	**2011 - 2019**	**1.73%**	**1.13%**	**3.94%**	**2.64%**

	YEAR	SF UNITS	MH UNITS	MF UNITS	TEMP UNITS	TOTAL RES UNITS	% SF Δ	% MH Δ	% MF Δ	% TOTAL Δ
Oroville - County	2011	2,040	1,249	99	0	3,388	-	-	-	-
	2012	2,040	1,247	99	0	3,386	0.00%	-0.16%	0.00%	-0.06%
	2013	2,041	1,247	99	0	3,387	0.05%	0.00%	0.00%	0.03%
	2014	2,041	1,248	99	0	3,388	0.00%	0.08%	0.00%	0.03%
	2015	2,042	1,249	99	0	3,390	0.05%	0.08%	0.00%	0.06%
	2016	2,043	1,250	99	0	3,392	0.05%	0.08%	0.00%	0.06%
	2017	2,038	1,250	99	0	3,387	-0.24%	0.00%	0.00%	-0.15%
	2018	2,036	1,251	99	0	3,386	-0.10%	0.08%	0.00%	-0.03%
	2019	2,035	1,247	99	3	3,384	-0.05%	-0.32%	0.00%	-0.06%
					Pre Camp Fire Residential Growth	**2011 - 2017**	**-0.10%**	**0.08%**	**0.00%**	**-0.03%**
					Camp Fire Residential Loss	**2017 - 2018**	**-0.10%**	**0.08%**	**0.00%**	**-0.03%**
					Overall growth over time tracked	**2011 - 2019**	**-0.25%**	**-0.16%**	**0.00%**	**-0.12%**

Table 1 Residential Structure Summary

	YEAR	SF UNITS	MH UNITS	MF UNITS	TEMP UNITS	TOTAL RES UNITS	% SF Δ	% MH Δ	% MF Δ	% TOTAL Δ
Paradise	2011	8,987	2,569	1,811	0	13,367	-	-	-	-
	2012	8,989	2,571	1,811	0	13,371	0.02%	0.08%	0.00%	0.03%
	2013	9,002	2,564	1,811	0	13,377	0.14%	-0.27%	0.00%	0.04%
	2014	9,011	2,564	1,859	0	13,434	0.10%	0.00%	2.65%	0.43%
	2015	9,018	2,560	1,892	0	13,470	0.08%	-0.16%	1.78%	0.27%
	2016	9,030	2,565	1,892	0	13,487	0.13%	0.20%	0.00%	0.13%
	2017	9,044	2,565	1,892	0	13,501	0.16%	0.00%	0.00%	0.10%
	2018	1,282	108	541	0	1,931	-85.82%	-95.79%	-71.41%	-85.70%
	2019	1,314	107	487	373	2,281	2.50%	-0.93%	-9.98%	18.13%
					Pre Camp Fire Residential Growth	**2011 - 2017**	**0.63%**	**-0.16%**	**4.47%**	**1.00%**
					Camp Fire Residential Loss	**2017 - 2018**	**-85.82%**	**-95.79%**	**-71.41%**	**-85.70%**
					Overall growth over time tracked	**2011 - 2019**	**-85.38%**	**-95.83%**	**-73.11%**	**-82.94%**

Table 2 Commercial Structure Summary

Values is KSF (1000's of Square Feet) **Hotel Rooms are count of rooms**

BUTTE COUNTY TOTAL

YEAR	RET	IND	OFF	MED	PQP	HOSP	HOTEL RMS	% RET Δ	% IND Δ	% OFF Δ	% MED Δ	% PQP Δ	% HOSP Δ	% TOTAL Δ
2011	15,083.54	22,119.98	7,651.98	3,609.64	6,048.70	1,052.05	2,143	-	-	-	-	-	-	-
2012	15,083.83	22,218.35	7,640.13	3,613.20	6,053.77	1,052.05	2,143	0.00%	0.44%	-0.15%	0.10%	0.08%	0.00%	0.00%
2013	15,040.41	22,379.21	7,638.61	3,613.20	6,039.88	1,156.41	2,143	-0.29%	0.72%	-0.02%	0.00%	-0.23%	9.92%	0.00%
2014	15,188.67	22,709.67	7,688.05	3,606.04	6,135.03	1,157.30	2,143	0.99%	1.48%	0.65%	-0.20%	1.58%	0.08%	0.00%
2015	15,194.04	22,846.76	7,631.99	3,666.69	6,142.86	1,157.30	2,143	0.04%	0.60%	-0.73%	1.68%	0.13%	0.00%	0.00%
2016	15,200.48	22,886.09	7,640.66	3,666.69	6,192.54	1,157.30	2,143	0.04%	0.17%	0.11%	0.00%	0.81%	0.00%	0.00%
2017	15,419.45	23,140.35	7,649.03	3,667.00	6,207.88	1,157.30	2,095	1.44%	1.11%	0.11%	0.01%	0.25%	0.00%	-2.24%
2018	13,704.21	23,133.25	7,653.10	3,301.04	5,922.86	1,157.30	2,029	-11.12%	-0.03%	0.05%	-9.98%	-4.59%	0.00%	-3.15%
2019	13,759.07	23,385.55	7,637.90	3,216.41	6,021.60	1,157.30	2,029	0.40%	1.09%	-0.20%	-2.56%	1.67%	0.00%	0.00%
						Pre Camp Fire Residential Growth	**2011 - 2017**	**-15.45%**	**3.31%**	**0.00%**	**0.00%**	**-9.60%**	**0.00%**	**0.00%**
						Camp Fire Residential Loss	**2017 - 2018**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
						Overall growth over time tracked	**2011 - 2019**	**-15.45%**	**8.22%**	**0.00%**	**0.00%**	**-9.60%**	**0.00%**	**0.00%**

Biggs

YEAR	RET	IND	OFF	MED	PQP	HOSP	HOTEL RMS	% RET Δ	% IND Δ	% OFF Δ	% MED Δ	% PQP Δ	% HOSP Δ	% TOTAL Δ
2011	97.58	857.02	19.70	0.00	58.96	0.00	0	-	-	-	-	-	-	-
2012	97.58	849.75	19.70	0.00	58.96	0.00	0	0.00%	-0.85%	0.00%	0.00%	0.00%	0.00%	0.00%
2013	97.58	849.75	19.70	0.00	58.96	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2014	97.58	885.36	19.70	0.00	58.96	0.00	0	0.00%	4.19%	0.00%	0.00%	0.00%	0.00%	0.00%
2015	82.51	885.36	19.70	0.00	58.96	0.00	0	-15.45%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2016	82.51	885.36	19.70	0.00	58.96	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2017	82.51	885.36	19.70	0.00	53.30	0.00	0	0.00%	0.00%	0.00%	0.00%	-9.60%	0.00%	0.00%
2018	82.51	885.36	19.70	0.00	53.30	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2019	82.51	927.45	19.70	0.00	53.30	0.00	0	0.00%	4.75%	0.00%	0.00%	0.00%	0.00%	0.00%
						Pre Camp Fire Residential Growth	**2011 - 2017**	**-15.45%**	**3.31%**	**0.00%**	**0.00%**	**-9.60%**	**0.00%**	**0.00%**
						Camp Fire Residential Loss	**2017 - 2018**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
						Overall growth over time tracked	**2011 - 2019**	**-15.45%**	**8.22%**	**0.00%**	**0.00%**	**-9.60%**	**0.00%**	**0.00%**

Table 2 Commercial Structure Summary

Values is KSF (1000's of Square Feet) **Hotel Rooms are count of rooms**

Chico

YEAR	RET	IND	OFF	MED	PQP	HOSP	HOTEL RMS	% RET Δ	% IND Δ	% OFF Δ	% MED Δ	% PQP Δ	% HOSP Δ	% TOTAL Δ
2011	7,722.52	9,110.64	5,548.24	2,185.27	2,059.03	743.86	1,323	-	-	-	-	-	-	-
2012	7,722.81	9,106.40	5,548.24	2,188.82	2,059.03	743.86	1,323	0.00%	-0.05%	0.00%	0.16%	0.00%	0.00%	0.00%
2013	7,674.19	9,169.50	5,548.24	2,188.82	2,059.03	785.58	1,323	-0.63%	0.69%	0.00%	0.00%	0.00%	5.61%	0.00%
2014	7,710.59	9,290.07	5,602.48	2,183.65	2,154.18	785.58	1,323	0.47%	1.31%	0.98%	-0.24%	4.62%	0.00%	0.00%
2015	7,714.64	9,319.67	5,542.01	2,244.30	2,154.71	785.58	1,323	0.05%	0.32%	-1.08%	2.78%	0.02%	0.00%	0.00%
2016	7,715.15	9,319.67	5,542.01	2,244.30	2,204.39	785.58	1,323	0.01%	0.00%	0.00%	0.00%	2.31%	0.00%	0.00%
2017	7,759.56	9,420.40	5,537.73	2,242.17	2,201.13	785.58	1,275	0.58%	1.08%	-0.08%	-0.09%	-0.15%	0.00%	-3.63%
2018	7,744.41	9,449.87	5,546.14	2,249.25	2,207.25	785.58	1,244	-0.20%	0.31%	0.15%	0.32%	0.28%	0.00%	-2.43%
2019	7,777.20	9,597.70	5,535.91	2,256.09	2,218.51	785.58	1,244	0.42%	1.56%	-0.18%	0.30%	0.51%	0.00%	0.00%

Pre Camp Fire Residential Growth	**2011 - 2017**	**0.48%**	**3.40%**	**-0.19%**	**2.60%**	**6.90%**	**5.61%**	**-3.63%**
Camp Fire Residential Loss	**2017 - 2018**	**-0.20%**	**0.31%**	**0.15%**	**0.32%**	**0.28%**	**0.00%**	**-2.43%**
Overall growth over time tracked	**2011 - 2019**	**0.71%**	**5.35%**	**-0.22%**	**3.24%**	**7.75%**	**5.61%**	**-5.97%**

County

YEAR	RET	IND	OFF	MED	PQP	HOSP	HOTEL RMS	% RET Δ	% IND Δ	% OFF Δ	% MED Δ	% PQP Δ	% HOSP Δ	% TOTAL Δ
2011	370.08	6,712.89	272.77	3.75	744.21	0.00	0	-	-	-	-	-	-	-
2012	370.08	6,822.77	260.91	3.75	750.40	0.00	0	0.00%	1.64%	-4.35%	0.00%	0.83%	0.00%	0.00%
2013	368.24	6,894.65	260.91	3.75	750.40	0.00	0	-0.50%	1.05%	0.00%	0.00%	0.00%	0.00%	0.00%
2014	368.66	7,001.62	262.41	3.75	750.40	0.00	0	0.11%	1.55%	0.57%	0.00%	0.00%	0.00%	0.00%
2015	368.66	7,119.41	262.41	3.75	750.40	0.00	0	0.00%	1.68%	0.00%	0.00%	0.00%	0.00%	0.00%
2016	368.66	7,119.41	262.41	3.75	750.40	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
2017	366.65	7,275.19	272.01	3.75	775.00	0.00	0	-0.55%	2.19%	3.66%	0.00%	3.28%	0.00%	0.00%
2018	356.38	7,351.45	274.65	3.75	771.65	0.00	0	-2.80%	1.05%	0.97%	0.00%	-0.43%	0.00%	0.00%
2019	356.38	7,424.36	276.65	3.75	833.59	0.00	0	0.00%	0.99%	0.73%	0.00%	8.03%	0.00%	0.00%

Pre Camp Fire Residential Growth	**2011 - 2017**	**-0.93%**	**8.38%**	**-0.28%**	**0.00%**	**4.14%**	**0.00%**	**0.00%**
Camp Fire Residential Loss	**2017 - 2018**	**-2.80%**	**1.05%**	**0.97%**	**0.00%**	**-0.43%**	**0.00%**	**0.00%**
Overall growth over time tracked	**2011 - 2019**	**-3.70%**	**10.60%**	**1.42%**	**0.00%**	**12.01%**	**0.00%**	**0.00%**

Table 2 Commercial Structure Summary

Values is KSF (1000's of Square Feet) **Hotel Rooms are count of rooms**

	YEAR	RET	IND	OFF	MED	PQP	HOSP	HOTEL RMS	% RET Δ	% IND Δ	% OFF Δ	% MED Δ	% PQP Δ	% HOSP Δ	% TOTAL Δ
Gridley	2011	836.37	1,098.62	232.28	95.07	445.73	43.87	25	-	-	-	-	-	-	-
	2012	836.37	1,098.62	232.28	95.07	445.73	43.87	25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2013	836.37	1,098.62	232.28	95.07	445.73	43.87	25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2014	869.49	1,098.62	225.97	95.07	445.73	43.87	25	3.96%	0.00%	-2.71%	0.00%	0.00%	0.00%	0.00%
	2015	869.49	1,098.62	225.97	95.07	445.73	43.87	25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2016	869.49	1,098.62	225.97	95.07	445.73	43.87	25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2017	869.49	1,098.62	225.97	95.07	445.73	43.87	25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2018	869.49	1,098.62	225.97	95.07	445.73	43.87	25	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2019	870.74	1,098.62	225.97	95.07	445.73	43.87	25	0.14%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
							Pre Camp Fire Residential Growth	**2011 - 2017**	**3.96%**	**0.00%**	**-2.71%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
							Camp Fire Residential Loss	**2017 - 2018**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
							Overall growth over time tracked	**2011 - 2019**	**4.11%**	**0.00%**	**-2.71%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

	YEAR	RET	IND	OFF	MED	PQP	HOSP	HOTEL RMS	% RET Δ	% IND Δ	% OFF Δ	% MED Δ	% PQP Δ	% HOSP Δ	% TOTAL Δ
Magalia	2011	179.55	48.90	68.16	8.51	145.22	0.00	0	-	-	-	-	-	-	-
	2012	179.55	48.90	68.16	8.51	145.22	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2013	179.55	48.90	68.16	8.51	145.22	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2014	179.55	48.90	68.16	8.51	145.22	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2015	188.66	48.90	68.16	8.51	145.22	0.00	0	5.08%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2016	188.66	48.90	68.16	8.51	145.22	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2017	179.19	48.90	68.16	8.51	145.40	0.00	0	-5.02%	0.00%	0.00%	0.00%	0.12%	0.00%	0.00%
	2018	144.14	48.90	39.56	8.51	143.11	0.00	0	-19.56%	0.00%	-41.96%	0.00%	-1.58%	0.00%	0.00%
	2019	144.14	48.90	39.56	8.51	143.11	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
							Pre Camp Fire Residential Growth	**2011 - 2017**	**-0.20%**	**0.00%**	**0.00%**	**0.00%**	**0.12%**	**0.00%**	**0.00%**
							Camp Fire Residential Loss	**2017 - 2018**	**-19.56%**	**0.00%**	**-41.96%**	**0.00%**	**-1.58%**	**0.00%**	**0.00%**
							Overall growth over time tracked	**2011 - 2019**	**-19.72%**	**0.00%**	**-41.96%**	**0.00%**	**-1.46%**	**0.00%**	**0.00%**

Table 2 Commercial Structure Summary

Values is KSF (1000's of Square Feet) **Hotel Rooms are count of rooms**

	YEAR	RET	IND	OFF	MED	PQP	HOSP	HOTEL RMS	% RET Δ	% IND Δ	% OFF Δ	% MED Δ	% PQP Δ	% HOSP Δ	% TOTAL Δ
Oroville	2011	3,719.27	2,264.70	650.04	604.11	1,559.53	104.88	644	-	-	-	-	-	-	-
	2012	3,719.27	2,264.70	650.04	604.11	1,558.41	104.88	644	0.00%	0.00%	0.00%	0.00%	-0.07%	0.00%	0.00%
	2013	3,719.27	2,264.70	650.04	604.11	1,552.91	104.88	644	0.00%	0.00%	0.00%	0.00%	-0.35%	0.00%	0.00%
	2014	3,786.66	2,268.75	650.04	604.11	1,552.91	104.88	644	1.81%	0.18%	0.00%	0.00%	0.00%	0.00%	0.00%
	2015	3,795.78	2,245.52	650.04	604.11	1,560.21	104.88	644	0.24%	-1.02%	0.00%	0.00%	0.47%	0.00%	0.00%
	2016	3,801.85	2,278.51	650.04	604.11	1,560.21	104.88	644	0.16%	1.47%	0.00%	0.00%	0.00%	0.00%	0.00%
	2017	3,983.17	2,278.51	650.04	604.11	1,559.69	104.88	644	4.77%	0.00%	0.00%	0.00%	-0.03%	0.00%	0.00%
	2018	3,472.64	2,384.07	1,068.05	546.21	1,651.02	104.88	644	-12.82%	4.63%	64.31%	-9.58%	5.86%	0.00%	0.00%
	2019	3,484.36	2,373.54	1,069.59	454.73	1,651.02	104.88	644	0.34%	-0.44%	0.14%	-16.75%	0.00%	0.00%	0.00%
								Pre Camp Fire Residential Growth	**2011 - 2017**	**7.10%**	**0.61%**	**0.00%**	**0.00%**	**0.01%**	**0.00%**	**0.00%**
								Camp Fire Residential Loss	**2017 - 2018**	**-12.82%**	**4.63%**	**64.31%**	**-9.58%**	**5.86%**	**0.00%**	**0.00%**
								Overall growth over time tracked	**2011 - 2019**	**-6.32%**	**4.81%**	**64.54%**	**-24.73%**	**5.87%**	**0.00%**	**0.00%**

	YEAR	RET	IND	OFF	MED	PQP	HOSP	HOTEL RMS	% RET Δ	% IND Δ	% OFF Δ	% MED Δ	% PQP Δ	% HOSP Δ	% TOTAL Δ
Oroville - County	2011	94.70	1,326.97	73.53	0.00	193.39	0.00	0	-	-	-	-	-	-	-
	2012	94.70	1,326.97	73.53	0.00	193.39	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2013	94.70	1,326.97	73.53	0.00	193.39	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2014	94.70	1,381.89	73.53	0.00	193.39	0.00	0	0.00%	4.14%	0.00%	0.00%	0.00%	0.00%	0.00%
	2015	94.70	1,381.89	73.53	0.00	193.39	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2016	94.70	1,381.89	73.53	0.00	193.39	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2017	93.37	1,373.65	76.57	0.00	193.39	0.00	0	-1.41%	-0.60%	4.15%	0.00%	0.00%	0.00%	0.00%
	2018	93.37	1,373.65	76.57	0.00	193.39	0.00	0	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2019	102.47	1,373.65	76.57	0.00	193.39	0.00	0	9.75%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
								Pre Camp Fire Residential Growth	**2011 - 2017**	**-1.41%**	**3.52%**	**4.15%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
								Camp Fire Residential Loss	**2017 - 2018**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**
								Overall growth over time tracked	**2011 - 2019**	**8.20%**	**3.52%**	**4.15%**	**0.00%**	**0.00%**	**0.00%**	**0.00%**

Table 2 Commercial Structure Summary

Values is KSF (1000's of Square Feet) **Hotel Rooms are count of rooms**

	YEAR	RET	IND	OFF	MED	PQP	HOSP	HOTEL RMS	% RET Δ	% IND Δ	% OFF Δ	% MED Δ	% PQP Δ	% HOSP Δ	% TOTAL Δ
Paradise	2011	2,063.48	700.24	787.29	712.94	842.63	159.44	151	-	-	-	-	-	-	-
	2012	2,063.48	700.24	787.29	712.94	842.63	159.44	151	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
	2013	2,070.52	726.11	785.77	712.94	834.24	222.08	151	0.34%	3.69%	-0.19%	0.00%	-1.00%	39.29%	0.00%
	2014	2,081.43	734.46	785.77	710.95	834.24	222.98	151	0.53%	1.15%	0.00%	-0.28%	0.00%	0.40%	0.00%
	2015	2,079.60	747.40	790.18	710.95	834.24	222.98	151	-0.09%	1.76%	0.56%	0.00%	0.00%	0.00%	0.00%
	2016	2,079.46	753.73	798.85	710.95	834.24	222.98	151	-0.01%	0.85%	1.10%	0.00%	0.00%	0.00%	0.00%
	2017	2,085.52	759.73	798.85	713.40	834.24	222.98	151	0.29%	0.80%	0.00%	0.34%	0.00%	0.00%	0.00%
	2018	941.27	541.34	402.46	398.27	457.40	222.98	116	-54.87%	-28.75%	-49.62%	-44.17%	-45.17%	0.00%	-23.18%
	2019	941.27	541.34	393.94	398.27	482.95	222.98	116	0.00%	0.00%	-2.12%	0.00%	5.58%	0.00%	0.00%
							Pre Camp Fire Residential Growth	**2011 - 2017**	**1.07%**	**8.49%**	**1.47%**	**0.06%**	**-1.00%**	**39.85%**	**0.00%**
							Camp Fire Residential Loss	**2017 - 2018**	**-54.87%**	**-28.75%**	**-49.62%**	**-44.17%**	**-45.17%**	**0.00%**	**-23.18%**
							Overall growth over time tracked	**2011 - 2019**	**-54.38%**	**-22.69%**	**-49.96%**	**-44.14%**	**-42.69%**	**39.85%**	**-23.18%**

Appendix A: Detailed Land Use Allocations by Jurisdiction

2025 Assumptions

2025 BCAG Regional Growth Forecasts	
Population	230,056
Housing Units	94,357
Households	87,092
Jobs (Non-Farm)	82,935
Jobs/Housing Unit	0.88

2025 Modeled Data

Residential	Housing Units	%
Single Family (SF_DU)	58,719	62%
Multi-Family (MF_DU)	26,245	28%
Mobile Home (MH_DU)	9,393	10%
Region Total	**94,357**	100%

Non-Residential	ksf	Jobs
Retail	13,082	26,163
Regional Retail	1,005	2,010
Industrial	15,247	16,924
Office	7,656	23,580
Medical Office	2,443	7,525
Public	2,351	3,620
Region Sub-Total	**41,783**	**79,822**

Non-Residential (cont.)	Unit	Jobs
Hospitals (HOSP_KSF)	1,018	2,738
Hotels (HOTEL_RMS)	2,122	849
University (UNIV_STU)	16,633	1,963
Butte College (CC_STU)	11,983	1,090
Schools (K12_STU)	31,578	2,779
Park (PARK_AC)	506	
Casino (CASINO_SLT)	2,000	
Region Sub-Total	-	**9,419**

Jobs Region Total	-	**89,241**

2025 Modeled Data (Occupancy Adjusted)

Residential	Households	%
Single Family (SF_DU)	54,312	62%
Multi-Family (MF_DU)	24,703	28%
Mobile Home (MH_DU)	8,550	10%
Region Total	**87,565**	100%

Non-Residential	ksf	Jobs
Retail	11,512	23,024
Regional Retail	885	1,769
Industrial	12,457	13,827
Office	6,737	20,750
Medical Office	2,021	6,223
Public	2,351	3,620
Region Sub-Total	**35,962**	**69,214**

Non-Residential (cont.)	Unit	Jobs
Hospitals (HOSP_KSF)	1,018	2,738
Hotels (HOTEL_RMS)	2,122	849
University (UNIV_STU)	16,633	1,963
Butte College (CC_STU)	11,983	1,090
Schools (K12_STU)	31,578	2,779
Park (PARK_AC)	506	
Casino (CASINO_SLT)	2,000	
Region Sub-Total	-	**9,419**

Region Total	-	**78,633**

2035 Assumptions

2035 BCAG Regional Growth Forecasts	
Population	251,266
Housing Units	107,266
Households	98,256
Jobs (Non-Farm)	86,470
Jobs/Housing Unit	0.84

2035 Modeled Data

Residential	Housing Units	%
Single Family (SF_DU)	67,845	63%
Multi-Family (MF_DU)	30,028	28%
Mobile Home (MH_DU)	9,393	9%
Region Total	**107,266**	100%

Non-Residential	ksf	Jobs
Retail	14,866	29,731
Regional Retail	1,085	2,170
Industrial	16,521	18,339
Office	8,704	26,809
Medical Office	2,755	8,485
Public	2,505	3,858
Region Sub-Total	**46,436**	**89,391**

Non-Residential (cont.)	Unit	Jobs
Hospitals (HOSP_KSF)	1,140	3,068
Hotels (HOTEL_RMS)	2,546	1,018
University (UNIV_STU)	18,909	2,231
Butte College (CC_STU)	13,623	1,240
Schools (K12_STU)	35,898	3,159
Park (PARK_AC)	536	
Casino (CASINO_SLT)	2,000	
Region Sub-Total	-	**10,716**

Jobs Region Total	-	**100,107**

2035 Modeled Data (Occupancy Adjusted)

Residential	Households	%
Single Family (SF_DU)	62,346	63%
Multi-Family (MF_DU)	28,113	28%
Mobile Home (MH_DU)	8,501	9%
Region Total	**98,961**	100%

Non-Residential	ksf	Jobs
Retail	12,487	24,974
Regional Retail	911	1,823
Industrial	13,878	15,405
Office	7,311	22,519
Medical Office	2,314	7,127
Public	2,505	3,858
Region Sub-Total	**39,407**	**75,706**

Non-Residential (cont.)	Unit	Jobs
Hospitals (HOSP_KSF)	1,140	3,068
Hotels (HOTEL_RMS)	2,546	1,018
University (UNIV_STU)	18,909	2,231
Butte College (CC_STU)	13,623	1,240
Schools (K12_STU)	35,898	3,159
Park (PARK_AC)	536	
Casino (CASINO_SLT)	2,000	
Region Sub-Total	-	**10,716**

Region Total	-	**86,422**

2045 Assumptions

2030 BCAG Regional Growth Forecasts	
Population	272,950
Housing Units	118,864
Households	108,879
Jobs (Non-Farm)	97,075
Jobs/Housing Unit	0.82

2045 Modeled Data

Residential	Housing Units	%
Single Family (SF_DU)	76,537	64%
Multi-Family (MF_DU)	32,934	28%
Mobile Home (MH_DU)	9,393	8%
Region Total	**118,864**	100%

Non-Residential	ksf	Jobs
Retail	18,445	36,890
Regional Retail	1,256	2,513
Industrial	18,201	20,203
Office	9,645	29,707
Medical Office	3,053	9,404
Public	2,775	4,273
Region Sub-Total	**53,376**	**102,990**

Non-Residential (cont.)	Unit	Jobs
Hospitals (HOSP_KSF)	1,285	3,457
Hotels (HOTEL_RMS)	2,595	1,038
University (UNIV_STU)	20,954	2,473
Butte College (CC_STU)	15,096	1,374
Schools (K12_STU)	39,780	3,501
Park (PARK_AC)	594	
Casino (CASINO_SLT)	2,000	
Region Sub-Total	-	**11,842**

Jobs Region Total	-	**114,832**

2045 Modeled Data (Occupancy Adjusted)

Residential	Households	%
Single Family (SF_DU)	70,083	64%
Multi-Family (MF_DU)	30,768	28%
Mobile Home (MH_DU)	8,476	8%
Region Total	**109,327**	100%

Non-Residential	ksf	Jobs
Retail	15,125	30,250
Regional Retail	1,030	2,060
Industrial	14,925	16,567
Office	7,909	24,360
Medical Office	2,504	7,711
Public	2,775	4,273
Region Sub-Total	**44,268**	**85,221**

Non-Residential (cont.)	Unit	Jobs
Hospitals (HOSP_KSF)	1,285	3,457
Hotels (HOTEL_RMS)	2,595	1,038
University (UNIV_STU)	20,954	2,473
Butte College (CC_STU)	15,096	1,374
Schools (K12_STU)	39,780	3,501
Park (PARK_AC)	594	
Casino (CASINO_SLT)	2,000	
Region Sub-Total	-	**11,842**

Region Total	-	**97,063**

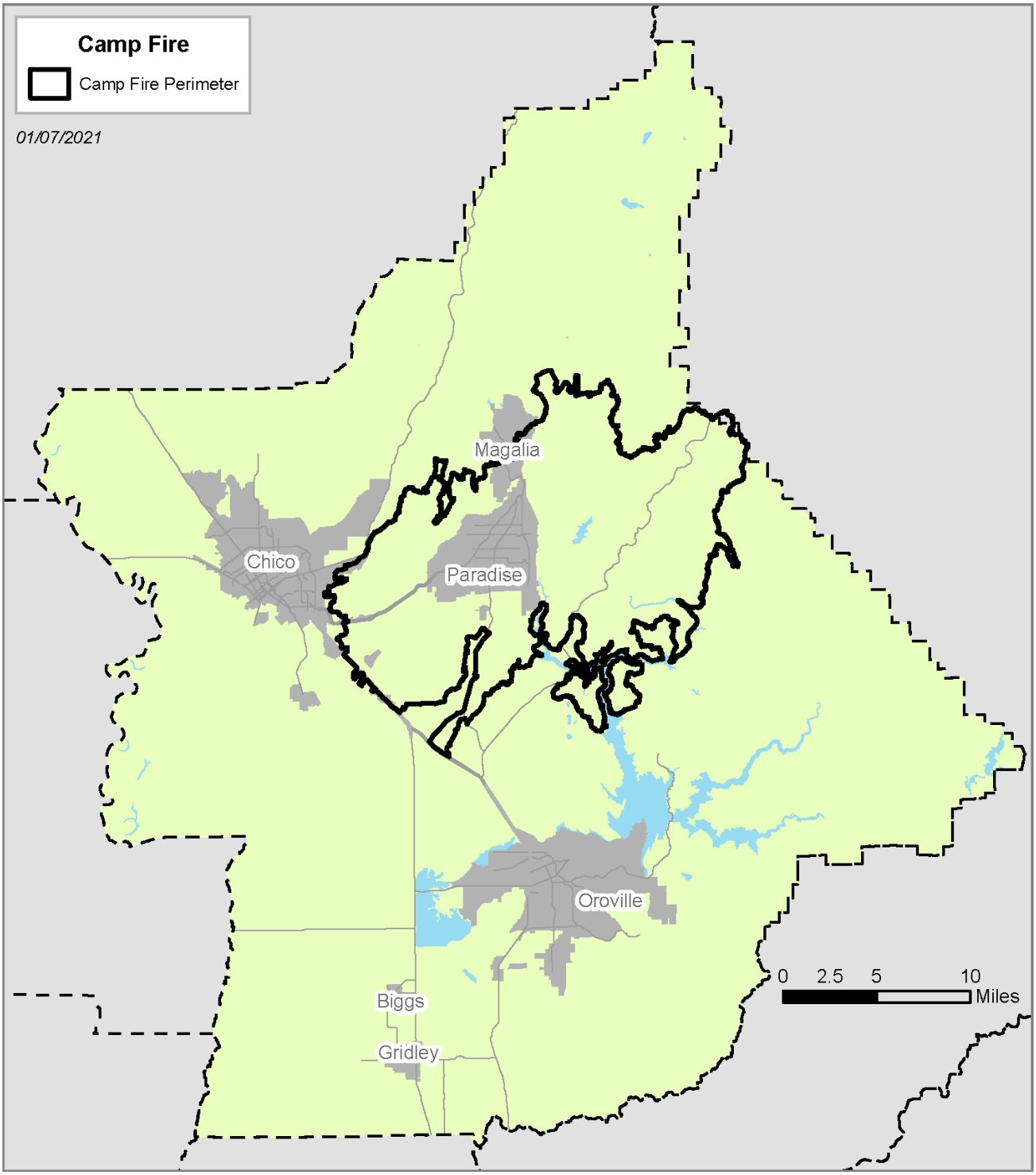
Appendix B: Building Permit Activity

Residential Building Permit Activity (Housing Units) 2000 – 2020

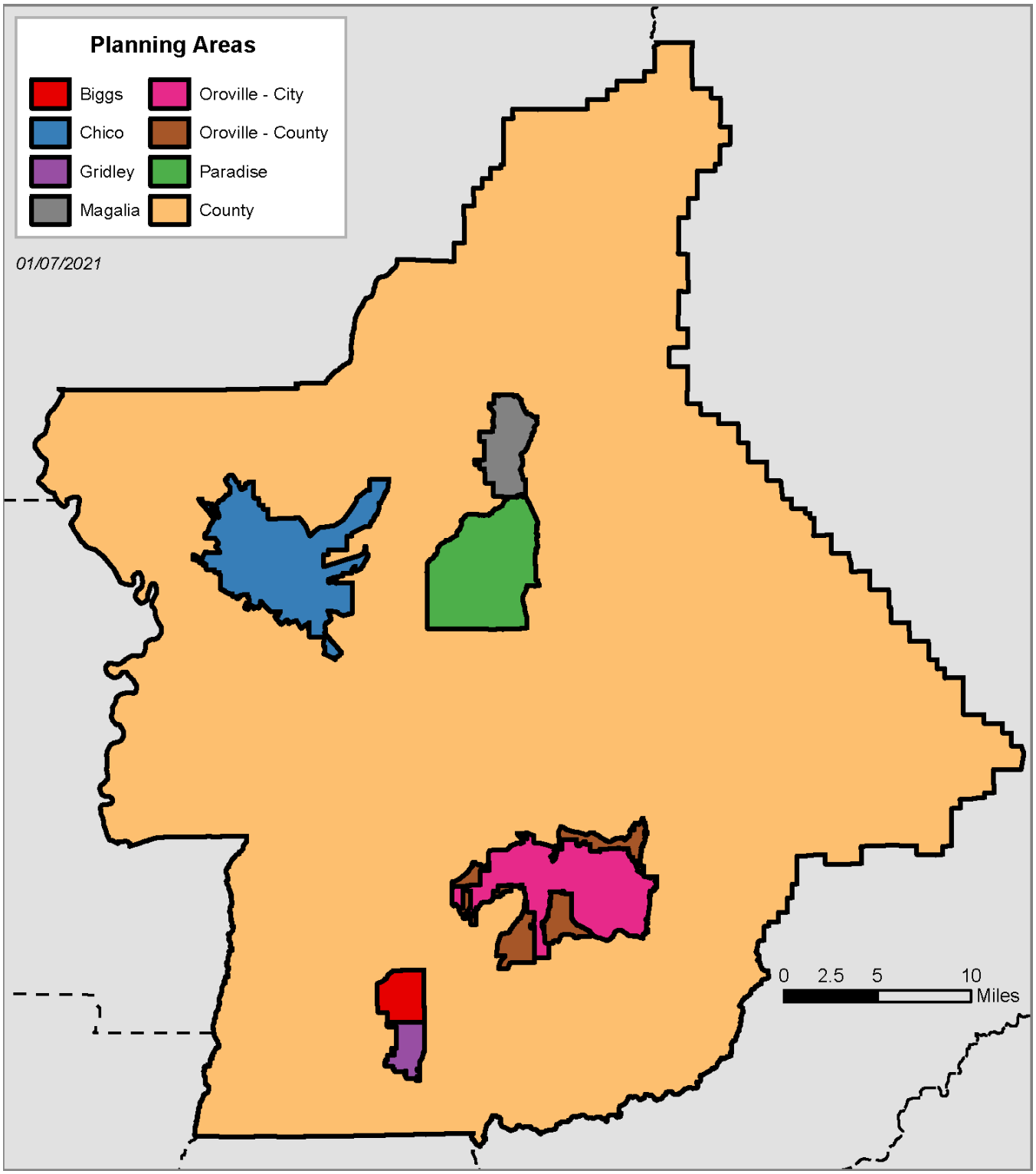
Jurisdiction	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Biggs	1	3	2	1	2	0	3	2	3	4	0	0	0	0	20	57	1	1	0	1	6
Chico	508	514	504	946	837	601	530	368	233	181	416	143	185	391	385	522	515	638	448	795	537
Gridley	72	23	5	9	13	152	112	76	12	0	1	4	63	9	3	3	2	16	0	0	32
Oroville	32	17	43	76	228	83	29	104	37	2	3	1	57	56	16	15	15	3	9	60	49
Paradise	74	58	76	93	125	70	43	47	27	9	5	44	42	11	22	35	18	25	26	312	508
Unincorporated	448	481	558	645	786	786	568	390	289	168	81	69	68	63	116	50	130	159	219	220	321
Total County	1,135	1,096	1,188	1,769	1,991	1,692	1,285	987	598	364	506	261	415	530	562	682	681	842	702	1,388	1,453

Sources:
City of Chico C404 annual permit reports;
City of Biggs - DOF housing and population report;
Butte County Monthly Building Activity Report;
Town of Paradise – Monthly Building Permit Reports;
US Census Bureau - Building Permit Surveys

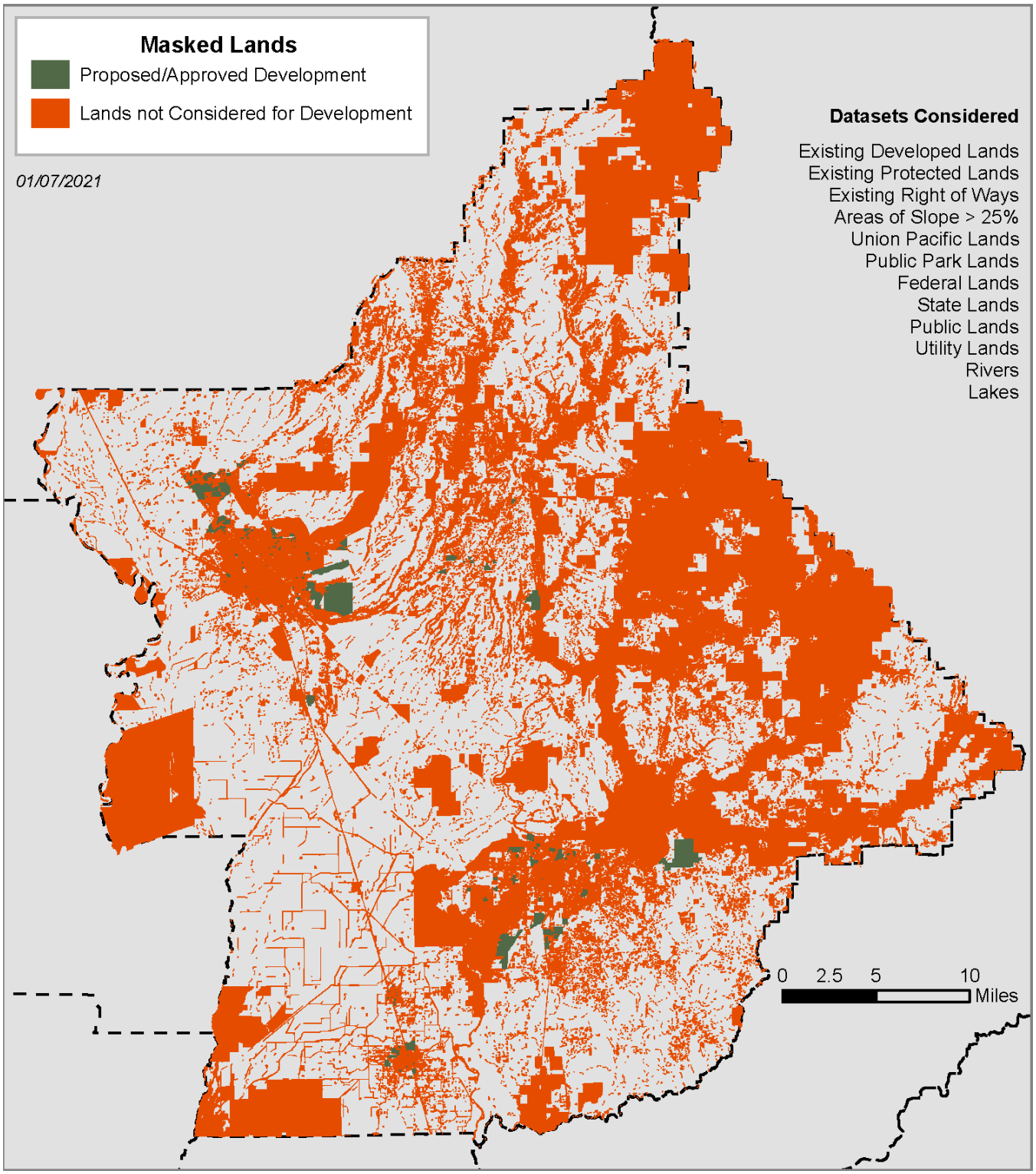
Appendix C: Camp Fire Burn Area



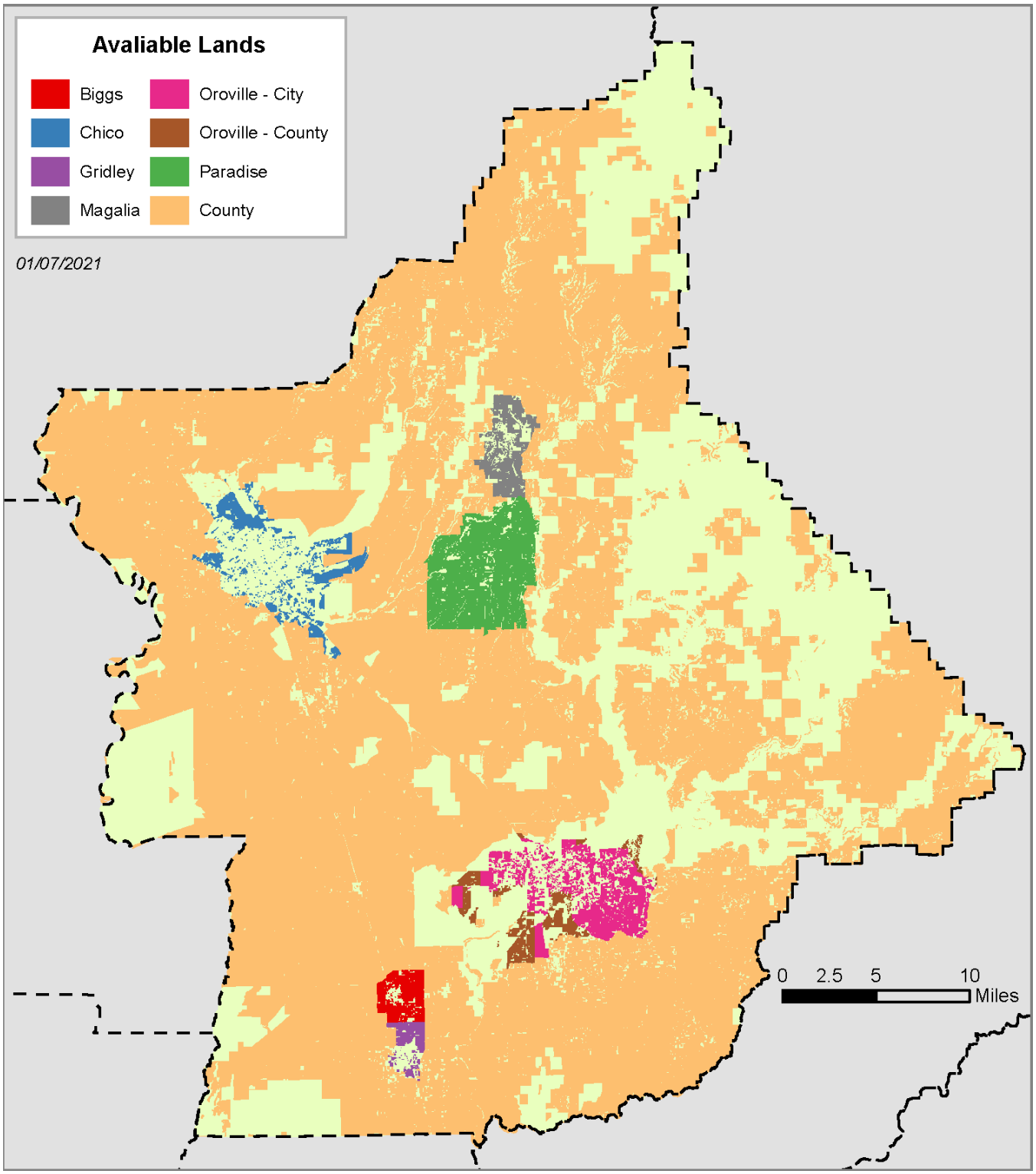
Appendix D: Regional Planning Areas



Appendix E: Masked Lands



Appendix F: Available Lands



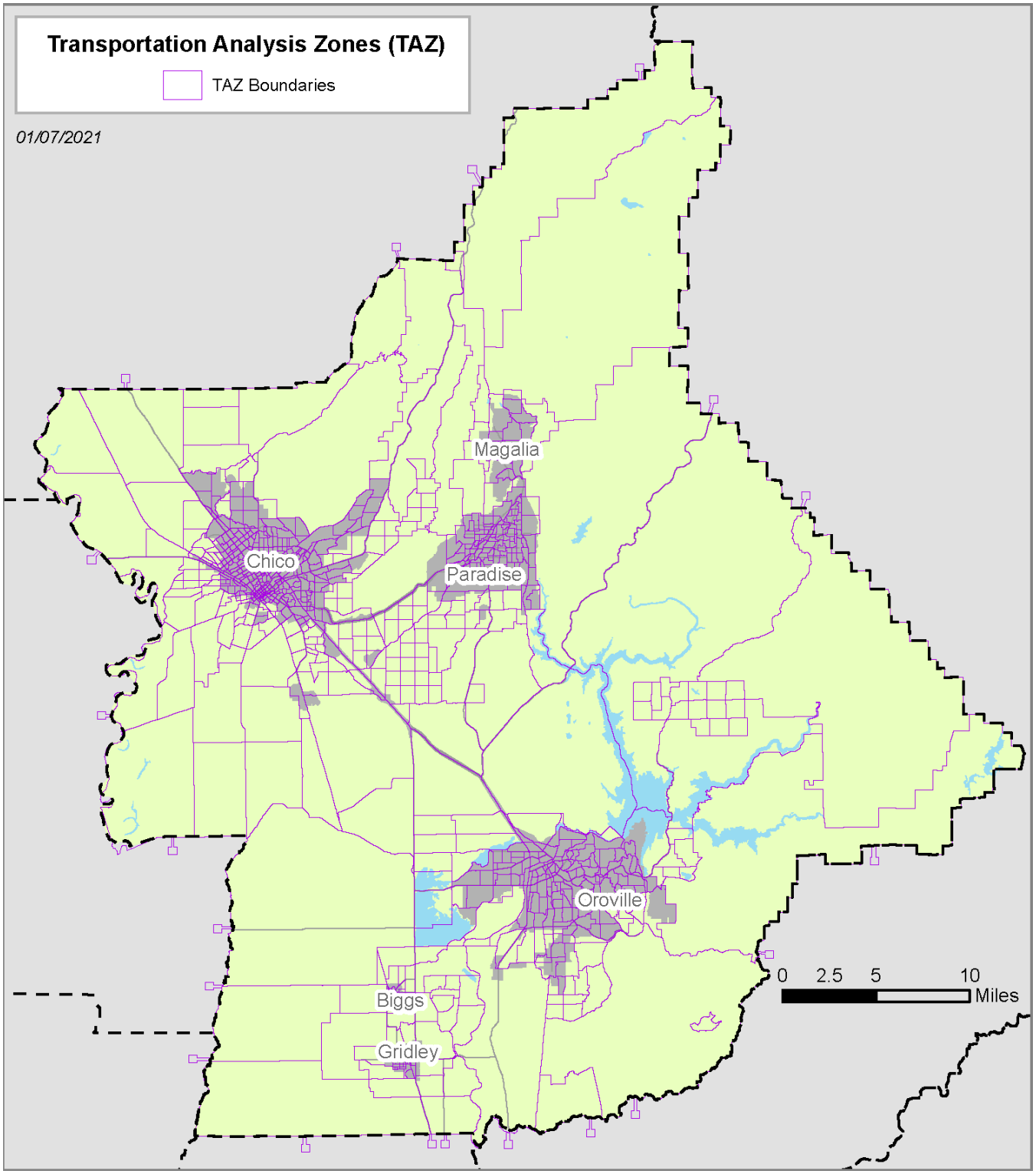
Appendix G: Land Use Assumptions

Modeling Assumptions

		CHICO				PARADISE				GRIDLEY				BIGGS			
Model Code	Model Classification	DU / AC	AVG SF / E	FAR	Mixed Use Ratio RES / RET / OFF / IND	DU / AC	AVG SF / E	FAR	Mixed Use Ratio RES / RET / OFF / IND	DU / AC	AVG SF / E	FAR	Mixed Use Ratio RES / RET / OFF / IND	DU / AC	AVG SF / E	FAR	Mixed Use Ratio RES / RET / OFF / IND
2	Industry		900	0.35			900	0.35			900	0.35			900	0.35	
5	Office Commercial		300	0.35			300	0.35			300	0.35			300	0.35	
6.1	Mixed Use Retail		500	0.3	0 / 85 / 15 / 0	0	416.7	0.5	0 / 70 / 30 / 0	20	454.5	1	10 / 60 / 30 / 0		428.6	0.3	0 / 70 / 30 / 0
6.2	Mixed Use Retail	13	545.5	0.3	10 / 75 / 15 / 0	13	555.6	1	30 / 40 / 30 / 0		428.6	0.3	0 / 70 / 30 / 0	20	454.5	1	10 / 60 / 30 / 0
6.3	Mixed Use Retail	33	537.6	1.7	15 / 73 / 12 / 0	6.5	555.6	0.5	30 / 40 / 30 / 0		428.6	0.3	0 / 70 / 30 / 0	13	461.5	0.3	10 / 60 / 30 / 0
6.4	Mixed Use Retail		534.7	0.3	0 / 85 / 10 / 5		403	0.3	0 / 40 / 40 / 20								
6.5	Mixed Use Retail	15.5	531	0.3	3 / 85 / 12 / 0		545.5	0.3	30 / 40 / 30 / 0								
6.6	Mixed Use Office	13	305.1	0.3	10 / 10 / 80 / 0	0											
6.7	Mixed Use Office	30	365	1.7	13 / 12 / 75 / 0	13											
7	Mixed Use Industrial	10.5	562.5	0.35	0 / 0 / 30 / 70		750	0.35	0 / 0 / 10 / 90		642.9	0.35	0 / 0 / 20 / 80		642.9	0.35	0 / 0 / 20 / 80
8.1	Mixed Use Residential	16.2	400	0.3	95 / 2 / 3 / 0												
8.2	Mixed Use Residential	50	400	1.7	90 / 5 / 5 / 0												
9	High Density Residential	40								22.5				20			
10	Medium-High Density	18.5				13											
11	Medium Density Residential	12								12				10			
12	Low Density Residential	5.1								5				4			
13	Very Low Density Residential	1.1				1.5				1							
14	Rural Residential																

		MAGALIA				OROVILLE				OROVILLE - COUNTY PORTION				COUNTY			
Model Code	Model Classification	DU / AC	AVG SF / E	FAR	Mixed Use Ratio RES / RET / OFF / IND	DU / AC	AVG SF / E	FAR	Mixed Use Ratio RES / RET / OFF / IND	DU / AC	AVG SF / E	FAR	Mixed Use Ratio RES / RET / OFF / IND	DU / AC	AVG SF / E	FAR	Mixed Use Ratio RES / RET / OFF / IND
1	Agriculture	0.05												0.05			
2	Industry		900	0.35			900	0.35			900	0.35			900	0.35	
5	Office Commercial		300	0.35			300	0.35			300	0.35			300	0.35	
6.1	Mixed Use Retail	13	461.5	0.3	10 / 60 / 30 / 0	20	507	0.3	15 / 60 / 25 / 0	13	514.3	0.3	10 / 70 / 20 / 0	13	461.5	0.3	10 / 60 / 30 / 0
6.2	Mixed Use Retail		409.1	0.3	0 / 65 / 35 / 0		428.6	0.3	0 / 70 / 30 / 0		473.7	0.3	0 / 80 / 20 / 0		409.1	0.3	0 / 65 / 35 / 0
6.3	Mixed Use Retail		409.1	0.3	0 / 65 / 35 / 0		337.5	0.3	0 / 30 / 60 / 10		428.6	0.3	0 / 70 / 30 / 0		409.1	0.3	0 / 65 / 35 / 0
6.4	Mixed Use Retail		409.1	0.3	0 / 65 / 35 / 0						473.7	0.3	0 / 80 / 20 / 0		409.1	0.3	0 / 65 / 35 / 0
6.5	Mixed Use Retail		275.5	0.3	0 / 0 / 90 / 10						275.5	0.3	0 / 0 / 90 / 10		275.5	0.3	0 / 0 / 90 / 10
6.6	Mixed Use Office																
6.7	Mixed Use Office																
7	Mixed Use Industrial		732.6	0.35	0 / 10 / 10 / 80						818.2	0.35	0 / 10 / 10 / 80		732.6	0.35	0 / 10 / 10 / 80
8.1	Mixed Use Residential																
8.2	Mixed Use Residential																
9	High Density Residential	20					25			20				20			
10	Medium-High Density						18.5										
11	Medium Density Residential	13					13			13				13			
12	Low Density Residential	4.5					5.5			4.5				4.5			
13	Very Low Density Residential	1					1			1				1			
14	Rural Residential	0.1125					0.1			0.1125				0.1125			
19	Timber	0.00625												0.00625			

Appendix H: Transportation Analysis Zones



Appendix I: Final Growth Allocation – 2045 Forecast