

COVID-19's Impact on Housing Demand in High-Density Areas – Evidence from Purchase Mortgage Applications

Rebecca Meeker and Nuno Mota
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Introduction

As the COVID-19 pandemic swept across the country in 2020, it touched nearly every aspect of the U.S. economy. In the housing market, new listings, home sales, and residential construction all plummeted in the spring of 2020. In the following months, the housing market proved resilient, thanks in large part to the decline in interest rates and supportive fiscal spending, with home sales and new construction reaching decade highs. In fact, total home sales in 2020 rose 7.2 percent to 6.46 million units, the highest annual level of sales since 2006.

Throughout 2020, there was widespread anecdotal evidence that the pandemic had shifted demand from core city centers to lower density markets, like the suburbs.¹ Fannie Mae's Q3 2020 National Housing Survey® (NHS) showed that on a national level, most people in households were where they wanted to be, with no noticeable uptick in people responding that they were planning to move soon.² However, when looking at the population of people submitting mortgage applications, there was a clear shift in behaviors. This paper uses proprietary Desktop Underwriter® (DU®) purchase mortgage applications for primary residences data to examine how the COVID-19 pandemic impacted housing demand, including the make-up of potential homebuyers, and assesses possible preference shifts evident in some of the largest markets in the country.

On a national level, we found there was a significant movement from high-density zip codes to lower-density zip codes in 2020.³ While there had been a slight increase in the high- to lower-density move share on a year-over-year basis in the first few months of 2020, the pandemic appears to have accelerated the trend, especially for first-time homebuyers (FTHB), who drove the overall increase more so than repeat buyers.⁴ Further, we showed that if, instead of classifying zip codes by population density, we do so by the predominant property type (e.g., single-family or multifamily) for housing units within the zip code or by the primary means of commuting to work (e.g., by car or other forms of transportation), a similar pattern

¹ Whitaker, 2021, has 16 examples of such articles, see: <https://www.clevelandfed.org/newsroom-and-events/publications/cfed-district-data-briefs/cfddb-20210205-did-the-covid-19-pandemic-cause-an-urban-exodus.aspx>

² See <https://www.fanniemae.com/research-and-insights/perspectives/covid-impact-consumers-q32020-nhs>

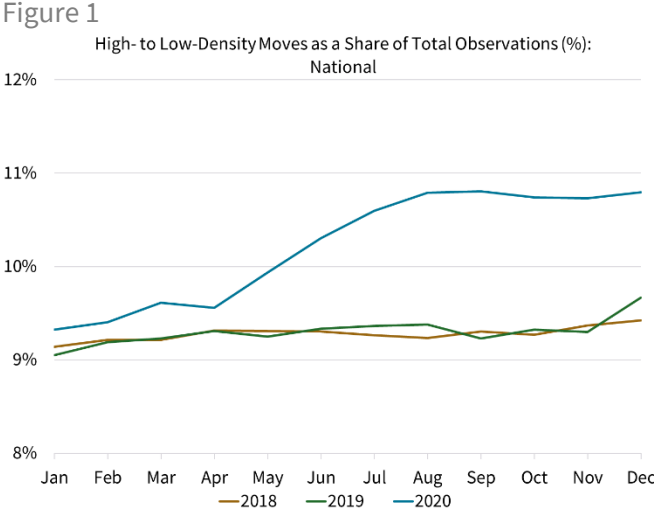
³ High-density is defined as zip codes within the top 20th percentile of people per square mile for each CBSA. Observations had zip codes both for where an applicant was currently located and for where the applicant was looking to buy, which were categorized into percentile groupings. Zip codes were placed into percentile buckets specific to the CBSA, so a move from the highest density bucket in one CBSA to the highest density bucket in another CBSA would not be counted as a high- to low-density move, even if the zip code being moved to had a significantly lower population per square mile. People per square mile data pulled from <https://blog.splitwise.com/2014/01/06/free-us-population-density-and-unemployment-rate-by-zip-code/> which sources the Decennial Census 2010, the ACS 5-year 2007-2011, and square-footage information from the 2013 U.S. Gazetteer Files.

⁴ Repeat buyers are defined as not first-time homebuyers. The first-time homebuyer definition follows the Internal Revenue Service's definition in which a loan is classified as being made to a first-time homebuyer if any of the borrowers on the loan meet either of the following criteria: 1) Had no homeownership interest during the three years prior to the purchase date, or 2) Is a displaced homeowner or single parent who had no homeownership interest other than a joint ownership with a spouse.

emerged. Namely, there was a pronounced increase in the share of moves that were going from predominantly multifamily zip codes to predominantly single-family zip codes, and an increase in moves from zip codes where workers primarily commute by a means other than driving a car to zip codes where driving to work is the norm. Within specific core-based statistical areas (CBSAs, synonymously referred to as “metros” in this paper), we found that the highest cost, highest density metros experienced the largest increases in shares of high- to lower-density moves. Additionally, while applications for moves within the same metros still dominated the market, the share of applications for moves out of metros increased modestly over the second half of 2020.⁵ While this paper focuses predominantly on shares of total applications, it is important to note that the level of purchase applications jumped significantly in 2020 compared to prior years, likely driven in part due to historically low mortgage rates, so an increase in share also represented a net increase in levels. Low mortgage rates helped drive demand for housing and this paper works to address the relative shifts of composition within the increase in applications.

Results - National

Figure 1 shows the total share of people applying to move from a high-density zip code to a lower-density zip increased significantly after the pandemic began. While the share rose slightly over 2019 and early 2020, in May 2020 the share spiked and remained elevated compared to the prior two years. Appendix Figure A2 shows that a similar pattern emerges when we assess the trends in applications from multifamily-dominated to single-family-dominated zip codes. This type of move consistently averaged around 4% of all applications but jumped up to around 5% after the pandemic began. Likewise, classifying moves by the primary means of commute in a zip code (per Appendix Figure A3) shows that the share of moves from zip codes where the dominant method of transportation is *not* driving to those zip codes where driving is the norm also saw a pronounced increase post-pandemic (moving from an average of 1% to 1.7%). Overall, the various measures indicated a clear national shift in the share of applications for moves away from density and employment locations (as measured by the likelihood of using driving as the dominate commute method).



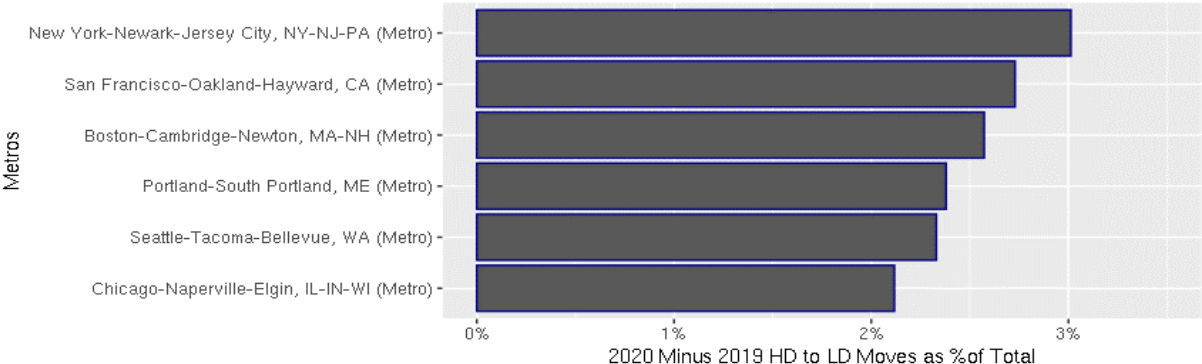
While the upward trend in moves from high- to lower-density zip codes was significant enough to be seen on a national scale, we wanted to gauge the extent to which it was being driven by only a few, large metro areas. To do so, we conducted a CBSA-level analysis.⁶ To start, we aggregated the share of high-density to lower-

⁵ Dates are defined as the final underwriting date associated with the application, aggregated to the monthly level.

⁶ When we talk about density moves by specific CBSAs, we are referring to the CBSA in which the applicant resided in when they submitted the loan application.

density moves for each CBSA in 2019 and 2020. We then subtracted the 2019 share from the 2020 share to determine if there was a significant increase in the 2020 share over the share from a year prior. We restricted our sample to the 161 metro CBSAs with at least 500 applications per month, of which 127 (79% of CBSAs) had a higher share of high- to lower-density moves in 2020 than in 2019. Restricting the sample to those CBSAs with a 2020 share that was at least 1 percentage point higher than in 2019 left us with 41 CBSAs (25% of CBSAs). Tightening the requirements even further, there were only six CBSAs that had a 2020 share more than 2 percentage points above its respective share in 2019 (see Figure 2).

Figure 2

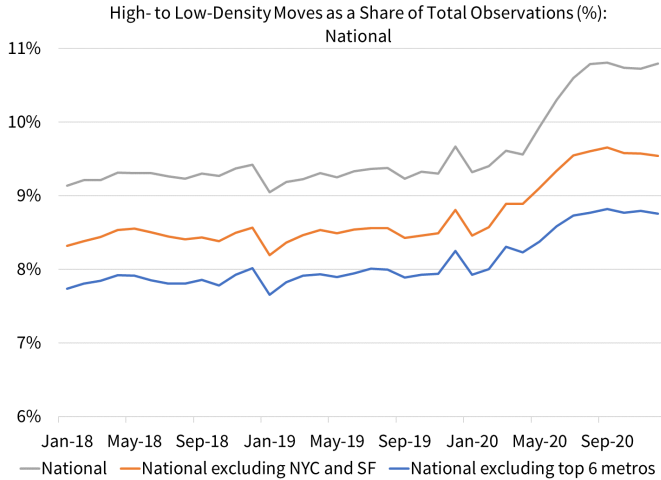


With the exception of Portland, ME, which is not in the top 100 metros by population, the other five metros are all among the top fifteen most populous cities in the U.S. Additionally, the New York City (NYC), San Francisco, Boston, and Seattle metros are consistently considered some of the most expensive cities in the country.⁷

When we look at the high- to lower-density move share of total observations, excluding all six of the metros mentioned above, the share dropped across the entire time horizon but by the greatest magnitude in the period after May 2020. Prior to the pandemic impacting the U.S. in March 2020, the top six metros had consistently boosted the national average by around 1.4 percentage points (calculated by subtracting the blue line from the grey line in Figure 3). However, that number jumped to averaging 1.9 percentage points in the eight months after May 2020, showing that these top metros were an increasingly large driver of the high- to lower-density trend during the pandemic. More specifically, the NYC and San Francisco metros, the top two cities in both density and cost, were primary drivers of the boost. Between December 2019 and December 2020, the share of high- to lower-density moves increased 1.1 percentage points nationally (grey line). When excluding the NYC and San Francisco metros (orange line), the share moved up 0.7 percentage points; and when excluding all six top metro areas (blue line), the share rose only 0.5 percentage points. Thus, we conclude that of the 0.6 percentage point difference between the slopes of the national share and the national share *excluding* the top six metros, the NYC and San Francisco metros accounted for around two-thirds of the total difference.

⁷ <https://taxfoundation.org/most-expensive-us-cities-and-metropolitan-areas-2020/>

Figure 3



While we explore the NYC and San Francisco metros more extensively later in this paper, first, we wanted to determine the extent to which high- to lower-density moves driven by the pandemic were within the same CBSAs or between different CBSAs. While high- to lower-density moves as a share of total observations increased for both moves within the same metro and across metros, the increase in cross-metro moves was much greater. Figure 4 demonstrates how this led to cross-metro moves making up a greater share of total high- to lower-density observations. To simplify, not only were more people moving from high- to lower-density areas, but they were increasingly doing so by moving out of their current CBSA, which could be due to households not being tied to a certain location due to an increase in remote work opportunities.

Although moves within the same metro clearly dominated our observations at over 80%, a closer look (Figure 5) shows that the share of applications for moves out of the same metro increased after COVID-19 began, compared to the prior two years. Moves out of metros historically reached the seasonal peak in the summer when children were out of school; however, this share did not decline following the end of summer in 2020 and the resumption of online schooling. Of all the applications for moves out of a metro area, high- to lower-density moves only accounted for approximately 10% (up to 11.5% during COVID-19), so the phenomenon was not exclusive to people fleeing core city centers for other, less dense metro zip codes. Moves out of metros was also a growing trend for people moving between lower-density zip codes.

Figure 4

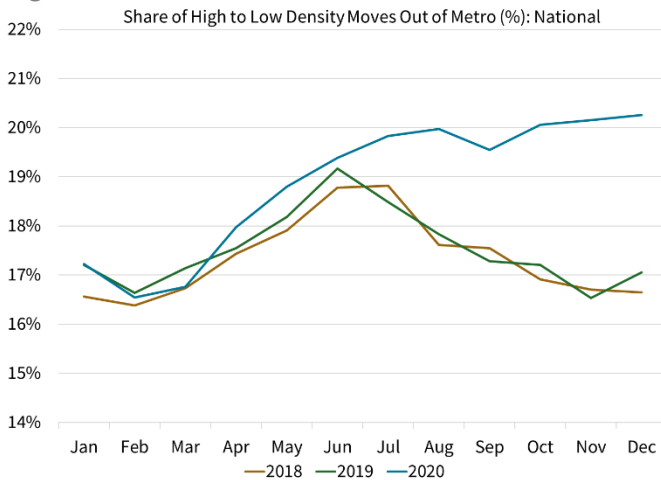
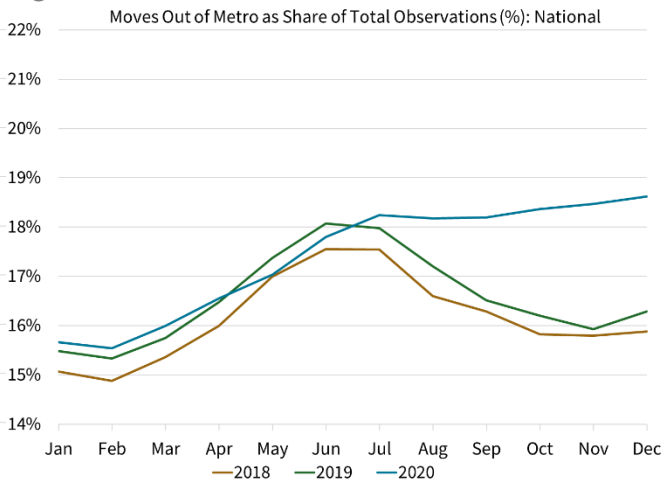


Figure 5



We also wanted to better understand who was driving these moves: FTHBs or repeat buyers. Figures 6 and 7 present the share of purchase mortgage applications that were FTHBs for both within- and cross-metro moves. For reference, the FTHB share of DU applications is consistently higher than what eventually is acquired by Fannie Mae due to the government segment of DU applications (namely the large share of FTHBs within FHA loans).⁸ Taking a deeper dive into the FTHB share on a national level, we see that an interesting trend arose in 2020 after the pandemic hit. In previous years, the FTHB share dropped from March until late summer; however, in 2020, the FTHB share rose between March and May. This pickup in the FTHB share could simply represent FTHBs delaying their moves once the pandemic hit, but, since the share remained elevated relative to previous years through the rest of 2020, it is clear that the FTHB prevalence in applications increased following the onset of the pandemic. This was a stark change in trend compared to the second half of 2019 and early 2020 when the FTHB share was falling significantly on a year-over-year basis. The pandemic-driven increase in FTHB share was particularly pronounced in out-of-metro moves. This may have been influenced by homebuyers, especially younger Millennials, who were already considering buying a home within the next few years and decided to pull-forward those purchases as circumstances changed due to COVID-19 (e.g., increased remote work opportunities)

Figure 6

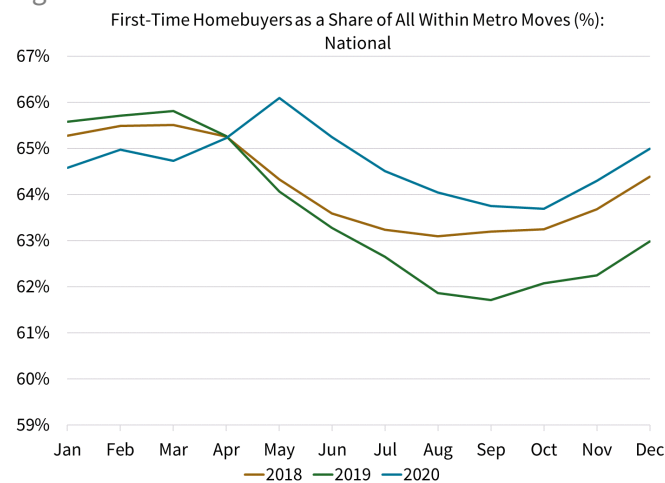
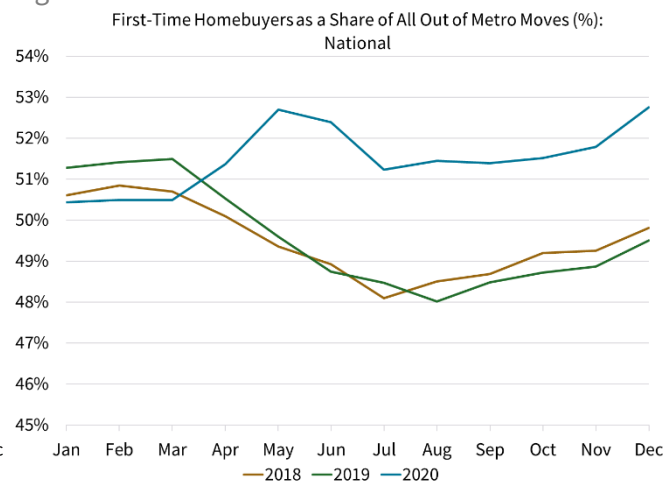


Figure 7



Dominating FTHB applications were moves across lower-density zip codes, which accounted for around 75% of all FTHB applications between 2018 and 2019. As a share of total observations, FTHBs moving to lower-density areas spiked during the pandemic, whether they were coming from high- or low-density zip codes. However, Figure 8 shows that FTHBs moving across low-density areas receded, pulling back from 47.5% in May 2020 to 45.3% in October 2020, which was in line with historical levels. Meanwhile, moves to high-density zip codes from either high- or low-density areas fell or were little changed throughout the three-year horizon. Finally, FTHBs moving from high- to lower-density as a share of total observations jumped in the months following the onset of the pandemic and remained consistently elevated (black line in Figure 8). Thus, of all FTHBs, the only density-move type that gained share during the pandemic was high- to lower-density moves, which averaged 11.9% in December 2020 versus 10.6% a year prior (Figure 9).

⁸ This is consistent with research from the Urban Institute, which reported the FTHB share for Government Sponsored Entities (GSE), Veteran Affairs (VA), and Federal Housing Administration (FHA) lending was approximately 49%, 50%, and 85%, respectively. Urban Institute. "Housing Finance at a Glance" *A Monthly Chartbook: November 2020*: 23. https://www.urban.org/sites/default/files/publication/103273/housing-finance-at-a-glance-a-monthly-chartbook-november-2020_0.pdf

Figure 8

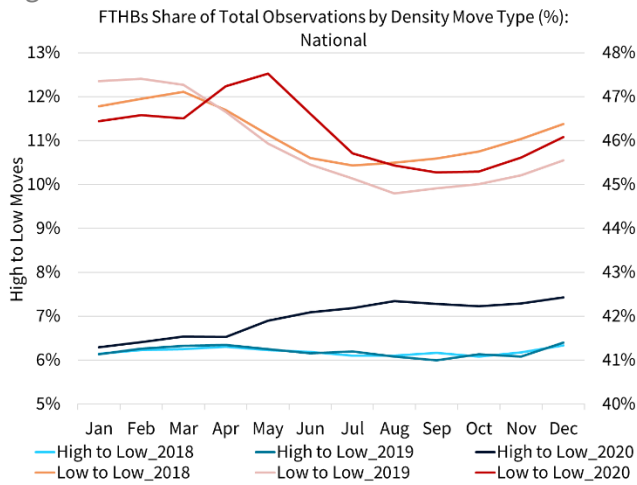
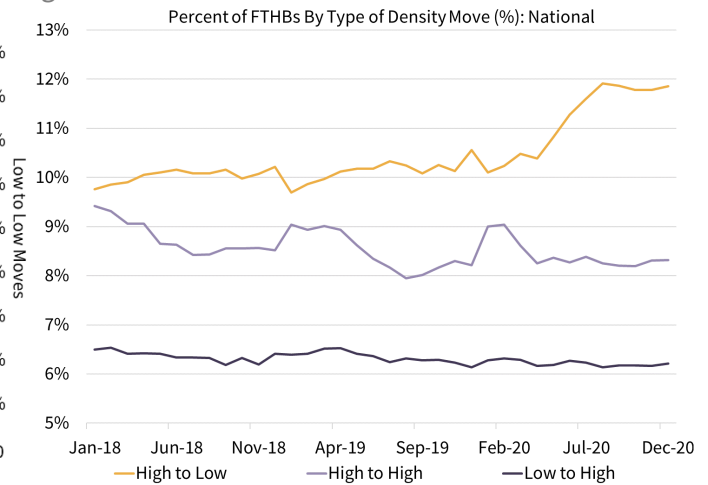


Figure 9



The trend of moving from high- to lower-density areas was not limited to FTHBs. Repeat buyers moving from high- to lower-density zip codes as a share of total observations also increased, albeit by a smaller amount than for FTHBs. Between December 2019 and December 2020, the share of repeat buyers applying to make high- to lower-density moves rose only one-tenth of a percent compared to FTHBs’ 1.0 percentage point gain. Thus, repeat buyers became a smaller share of total high- to lower-density moves.

On a national basis, we conclude that the movement away from high-density areas in 2020 was a widespread phenomenon across a large percentage of metros. However, only around 25% of metros showed a significant difference between 2020 and the year prior. Of those, six metros accounted for 18% of all high- to lower-density moves during the pandemic, and almost all of them contained the most populous and expensive cities in the country. The rest of this paper focuses on the NYC and San Francisco metros, where the movement away from density phenomenon was most pronounced.

Results - New York-Newark-Jersey City, NY-NJ-PA (Metro)

Compared to the national trend, historically, the NYC metro has seen a higher share of applications for moves from high- to lower-density zip codes (Figure 10). However, this difference was exacerbated in May 2020 after NYC become an epicenter of the COVID-19 pandemic. Similar patterns are visible when looking at the share of applications from predominantly multifamily to predominantly single-family zip codes (Appendix Figure A5) or the share of applications from zip codes where workers tend to commute using a means other than driving to zip codes where driving is the norm (Appendix Figure A6). The similarity of results across these three classification schemes is particularly interesting given that, while there is some overlap in the classification, these three schemes clearly pick out different focus areas (see Appendix Figure A10).

As widely reported, COVID-19 hit NYC especially hard. In March 2020, the city’s infection rate was five times higher than the rest of the country and in early May it was reported that NYC deaths accounted for one-fourth of all U.S. COVID-19 deaths.⁹ During this time, strict stay-at-home orders were issued for the metro and were only eased in early June 2020. With hospitals over capacity and morgues full, people increasingly left the NYC

⁹ See <https://www.cnn.com/2020/03/23/new-york-coronavirus-cases-surge-38percent-overnight-to-20875.html> and <https://www.nbcnewyork.com/news/local/cdc-finds-another-5000-nyc-deaths-in-march-and-april-with-potential-covid-19-links/2411670/>

metro for less dense areas. Per Figure 11, the share of high- to lower-density moves out of the NYC metro jumped in the spring and peaked in July at 31.7%. That number represented just under 5% of all observed NYC metro applications.

Figure 10

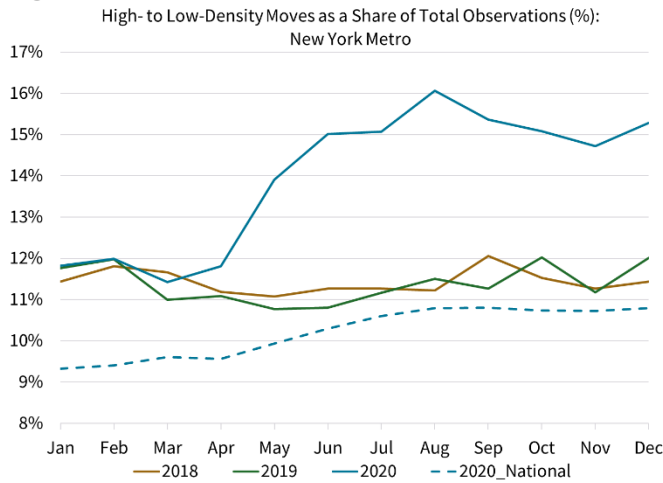
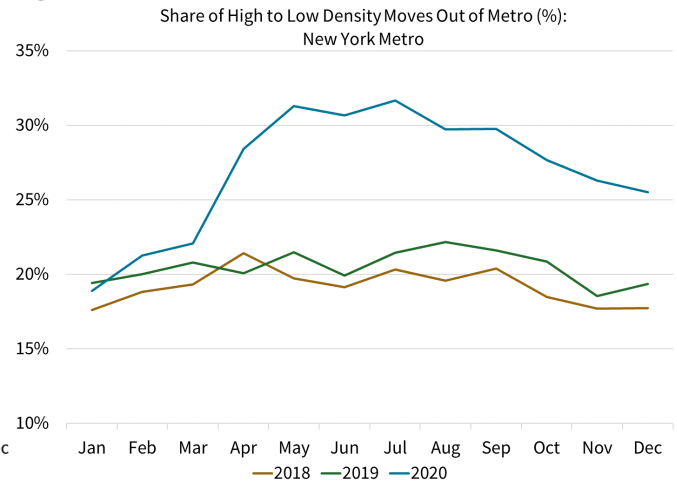
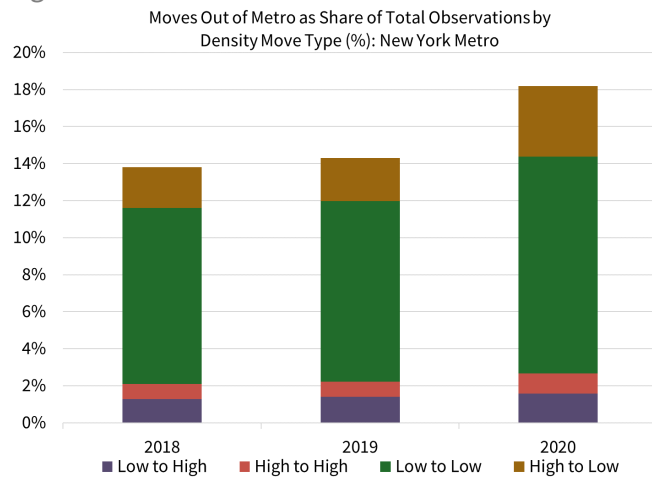


Figure 11



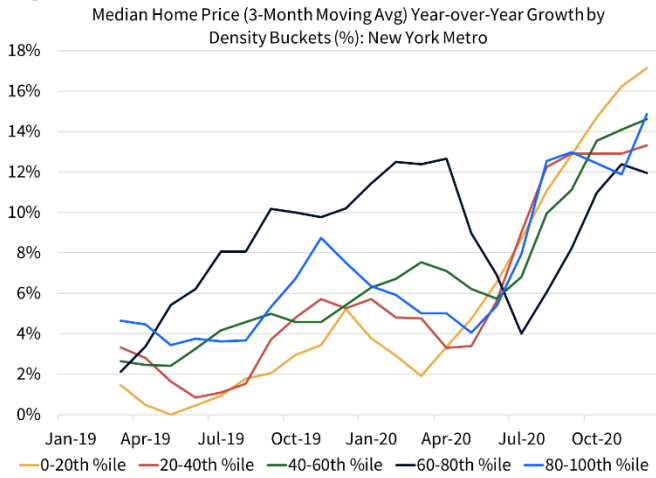
The share of applications for moves out of the NYC metro also peaked in July 2020, with moves between lower-density zip codes accounting for the largest share of these moves. Figure 12 shows the average share of each density move type out of a metro area for each year in our sample.

Figure 12



Looking more closely within the NYC metro, we can see how the flight from density affected home prices. As we expected, applications to purchase homes in the highest density (i.e., top 20th percentile) zip codes showed the highest median home prices by a significant margin throughout the entire three-year horizon, and the lowest density (i.e., bottom 20th percentile) zip codes showed the lowest median home prices. However, Figure 13 illustrates that when looking at the annual appreciation of home prices' three-month moving average by density bucket, the lowest-density zip codes showed the fastest home price appreciation after the pandemic began. Additionally, the second-densest bucket of zip codes, which had experienced the greatest acceleration in home prices in the year prior to the pandemic, slowed by the greatest magnitude of any density bucket after the pandemic began.

Figure 13



The high prevalence of renters in NYC provided a large source of potential FTHBs. Figure 14 shows that the NYC Metro had a much higher rate of FTHBs as a share of total observations compared to the national average of around 62%. We can also see that while there was an unseasonably strong FTHB share through the spring and summer of 2020, it has since declined and did not remain above the prior two-year levels like it did nationally in the second half of the year. Interestingly, despite the overall slowing of the FTHB share, the share of FTHBs who were moving from high- to lower-density did not fall back to historically normal levels in the NYC metro. Figure 15 shows that for both FTHBs and repeat buyers, the share making high- to lower-density moves jumped around May 2020. At the peaks in August 2020, the share of FTHBs making these moves was 5.1 percentage points above a year prior, while the share of repeat buyers making the moves was 2.7 percentage points higher. The share for repeat buyers has trended steadily downward since that time, with the exception of a slight tick upward in December 2020. While the share for FTHBs also fell from its August 2020 peak, it remained unusually elevated through December.

Figure 14

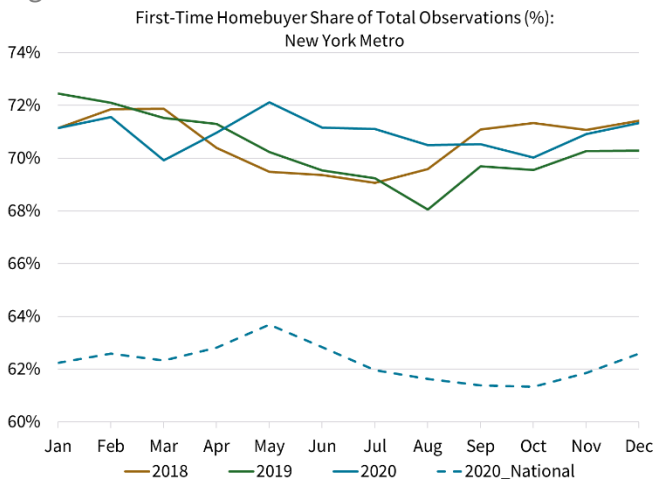
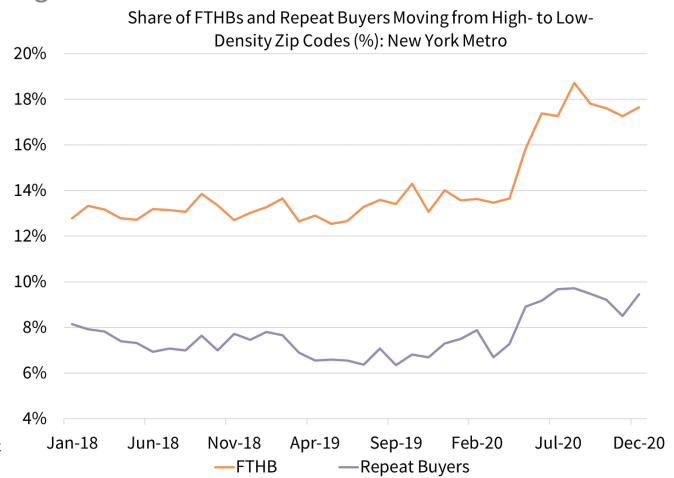


Figure 15

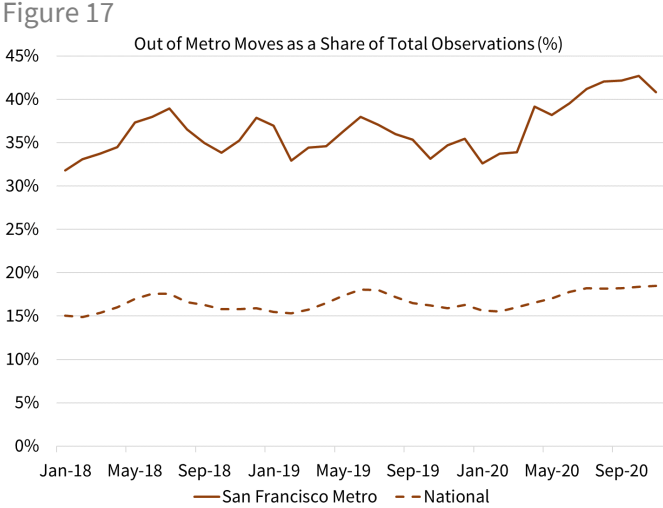
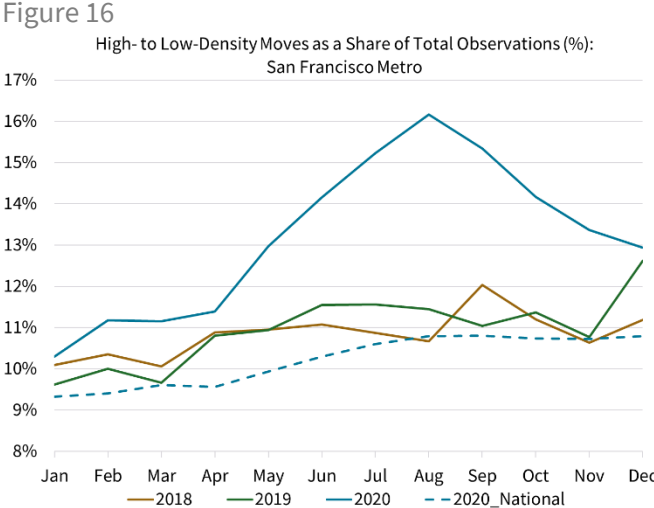


Results - San Francisco-Oakland-Hayward, CA (Metro)

Similar to the NYC metro, historically, San Francisco has seen a slightly higher share of applications for moves from high- to lower-density zip codes compared to the national average (Figure 16). Both the San Francisco and NYC metros saw this share jump after the pandemic began, peaking in August 2020 at around 16%. However, compared to NYC, the San Francisco share of applications for high- to lower-density moves declined

dramatically later in 2020. In December 2020, the NYC metro share hovered above 15%, while the San Francisco Metro share had fallen an additional 2 percentage points to 13%. The August 2020 peak in San Francisco moves to lower density corresponded with a rise in COVID-19 cases in the city at the end of June and through July 2020.¹⁰ The subsequent decline in cases through the end of October also seems to have corresponded with the decline in moves to lower-density zip codes.¹¹ While California COVID-19 cases hit all-time highs in December 2020 and early January 2021, resulting in the implementation of lockdown measures in the San Francisco area, cases declined steadily during the rest of Q1 2021 as vaccination efforts ramped up. It will be interesting to see if the 2021 data reflects these ebbs and flows of the pandemic in additional spikes or declines of moves from high- to lower-density moves.

San Francisco differed greatly from NYC in its share of applicants wishing to move out of the metro area. While NYC’s share was largely in line with the national average at below 20%, San Francisco had an uncommonly large share of moves out of the metro area throughout the observed timeframe of between 30% and 40% (Figure 17). That share increased even further after the pandemic began, averaging 43% in November before a slight pullback in December 2020. Of applicants wishing to move from a high- to lower-density zip code, about half were planning an out-of-metro move in August 2020, up from 36% a year prior. This share pulled back slightly later in the year but remained at 47% in December 2020.



Like the NYC metro, the San Francisco metro also had a larger share of FTHBs than the national average. Additionally, the pandemic does appear to have pushed upward the FTHB share of total observations compared to prior years. However, unlike NYC and the national average, San Francisco’s FTHB share did not peak in May 2020 and then retreat. Instead, the share has continued to trend upward (Figure 18), up a full 3.6 percentage points in December 2020 compared to a year prior. Interestingly, a consistently higher share of FTHBs did not translate to a consistently elevated share of high- to lower-density moves. Renters in the highest-density zip codes seemed to be more likely to stay in place later in the year, while renters making moves across low-density zip codes increased to keep the FTHB share elevated (Figure 19).

¹⁰ <https://data.sfgov.org/stories/s/dak2-gvuj>

¹¹ Similar patterns are visible for the other two zip code classification schemes, seen in Appendix Figures A8 and A9. The robustness of results across these measures is interesting given the different areas that may be captured by the three schemes (per Appendix Figure A11).

Figure 18

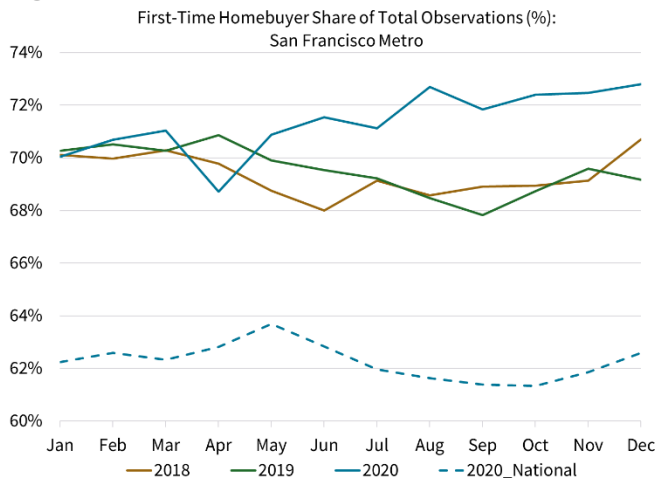
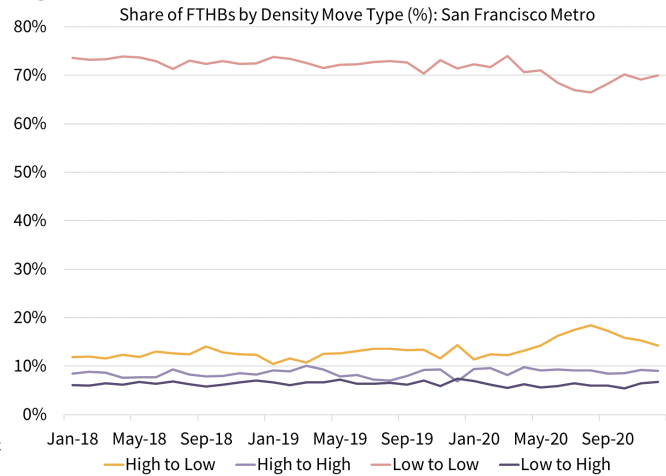
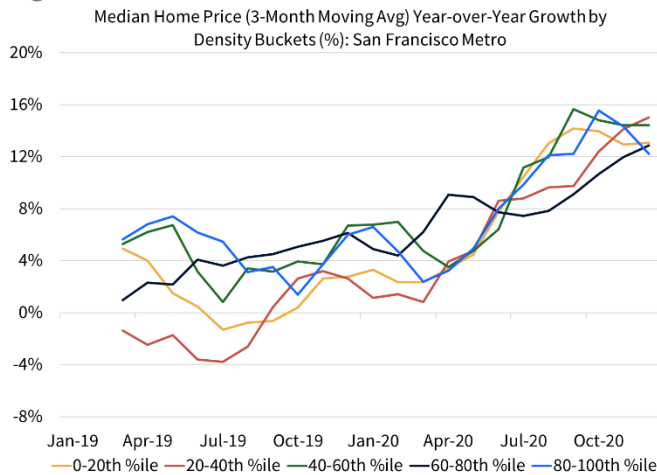


Figure 19



While San Francisco saw a large increase in high- to lower-density moves during the summer of 2020, there did not appear to be the same extraordinary acceleration in the lowest-density median home prices, as was the case in NYC. All density buckets appear to have seen unusually high home price growth in the second half of 2020. It is true that within our observed timeframe we saw median home prices for the lowest-density groupings transition from declining to accelerating strongly; however, this upward trend had already begun prior to the pandemic (Figure 20). The greatest gains in home price appreciation between March and December 2020 happened in the second-lowest density zip codes. The highest-density zip codes also saw significant home price appreciation during the pandemic. This could have been due to higher demand from people outside of the metro wishing to move into the San Francisco core city area. Moves into – and demand for – these metros from outside areas is a topic for further exploration.

Figure 20



Conclusion

Overall, our findings show that there was a clear shift post-March 2020 in migration patterns, as evidenced by DU purchase mortgage application data. The share of mortgage applications for moves from high-density zip codes to lower-density zip codes increased significantly and remained elevated through the end of 2020. A similar pattern is evident when looking at the share of moves from predominantly multifamily zip codes to those consisting of predominantly single-family housing, or the share of moves from zip codes where the primary means of commuting is not driving to those where driving is the norm. Together, these three

alternate classifications provide robust evidence of this national shift in the areas targeted by borrowers to purchase a home.

Additionally, we observed that this migration phenomenon was most pronounced in the NYC and San Francisco metro areas. Both metros are high-housing cost areas where renters were disproportionately likely to purchase a home in less-dense, cheaper areas of the country. We see this pattern as evidence that FTHBs may have chosen to accelerate their moving timelines (from renting to owning) as a result of the pandemic.

While our results show an evident shift in the areas where borrowers sought to purchase a home in the second half of 2020, it is clear this does not paint the whole picture of how migration patterns may have shifted as a result of the pandemic. For one, this view was limited to people seeking to buy a home with a mortgage and, therefore, missed anyone moving to a rental home or those who may have purchased without a mortgage. Evidence from third-party researchers shows that renters also displayed a pattern of moving away from density and that fewer renters moved into high-cost metro areas in the second half of 2020.¹² Lastly, it remains to be seen how much of the pattern of moving away from density will be sustained in the years to come, post-pandemic. To the extent that large metro areas maintain the amenity values that drew people to them in the first place, we may expect people to flock back to these areas once the pandemic subsides. On the other hand, the pandemic experience of working remotely in a lower housing cost area likely appealed to many workers, and it may be a lifestyle benefit they plan to maintain, thereby attenuating any potential “return to the cities” migration phenomenon.

¹² See Whitaker, 2021: <https://www.clevelandfed.org/newsroom-and-events/publications/cfed-district-data-briefs/cfddb-20210205-did-the-covid-19-pandemic-cause-an-urban-exodus.aspx>

Appendix

Figure A1 – Shares of All DU Applications for Moves by Zip Code’s Relative Population Density – All Applications

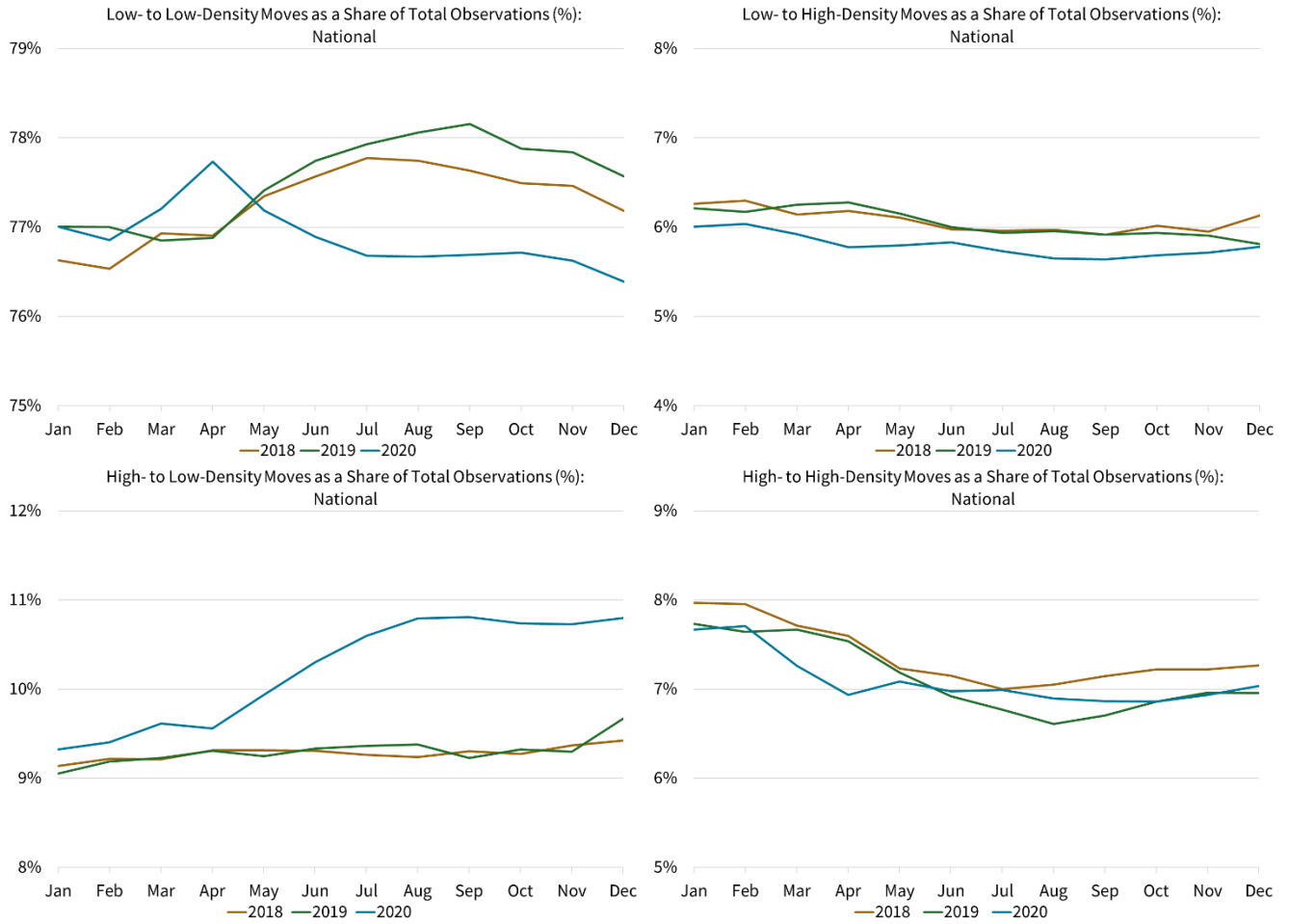
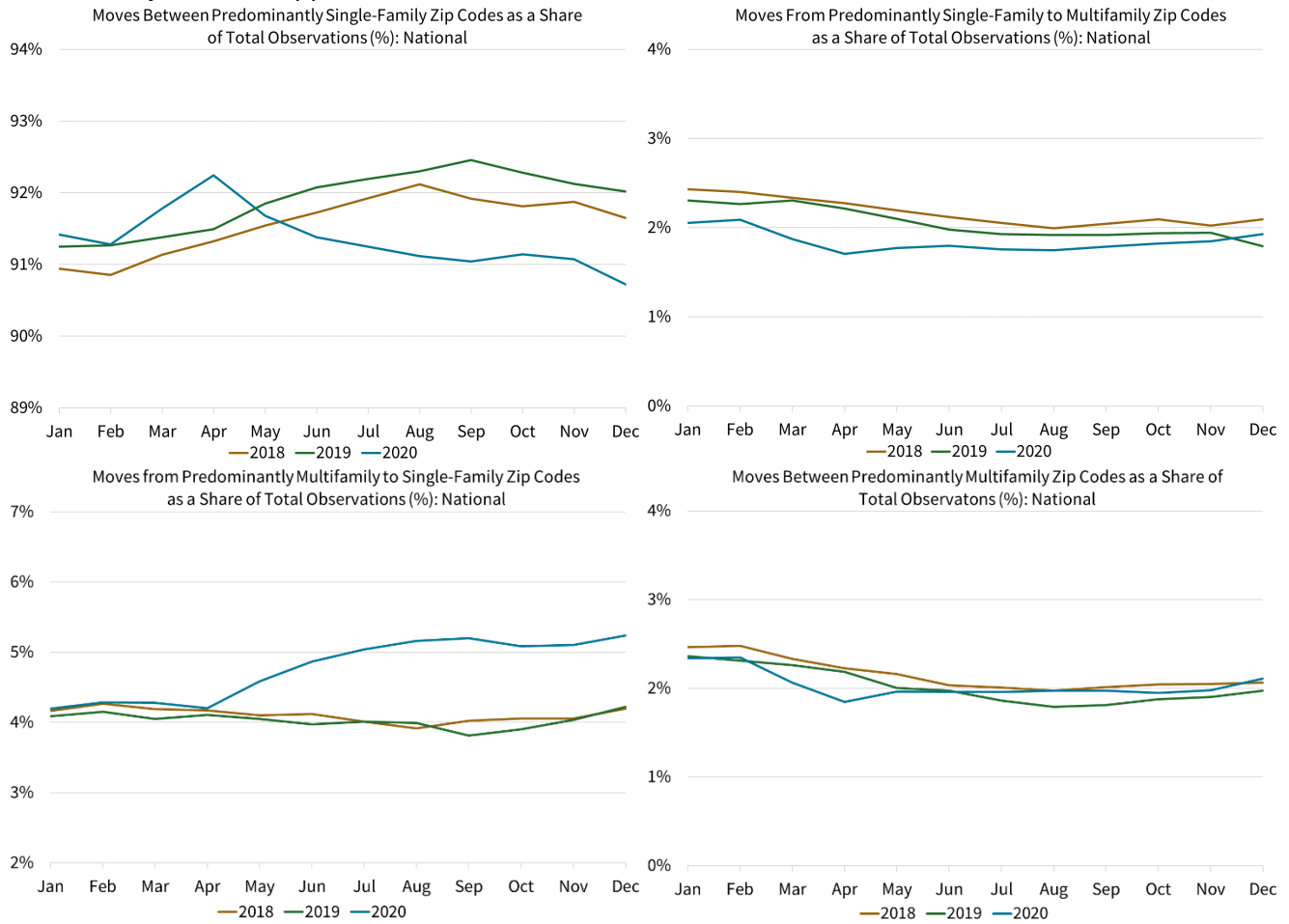
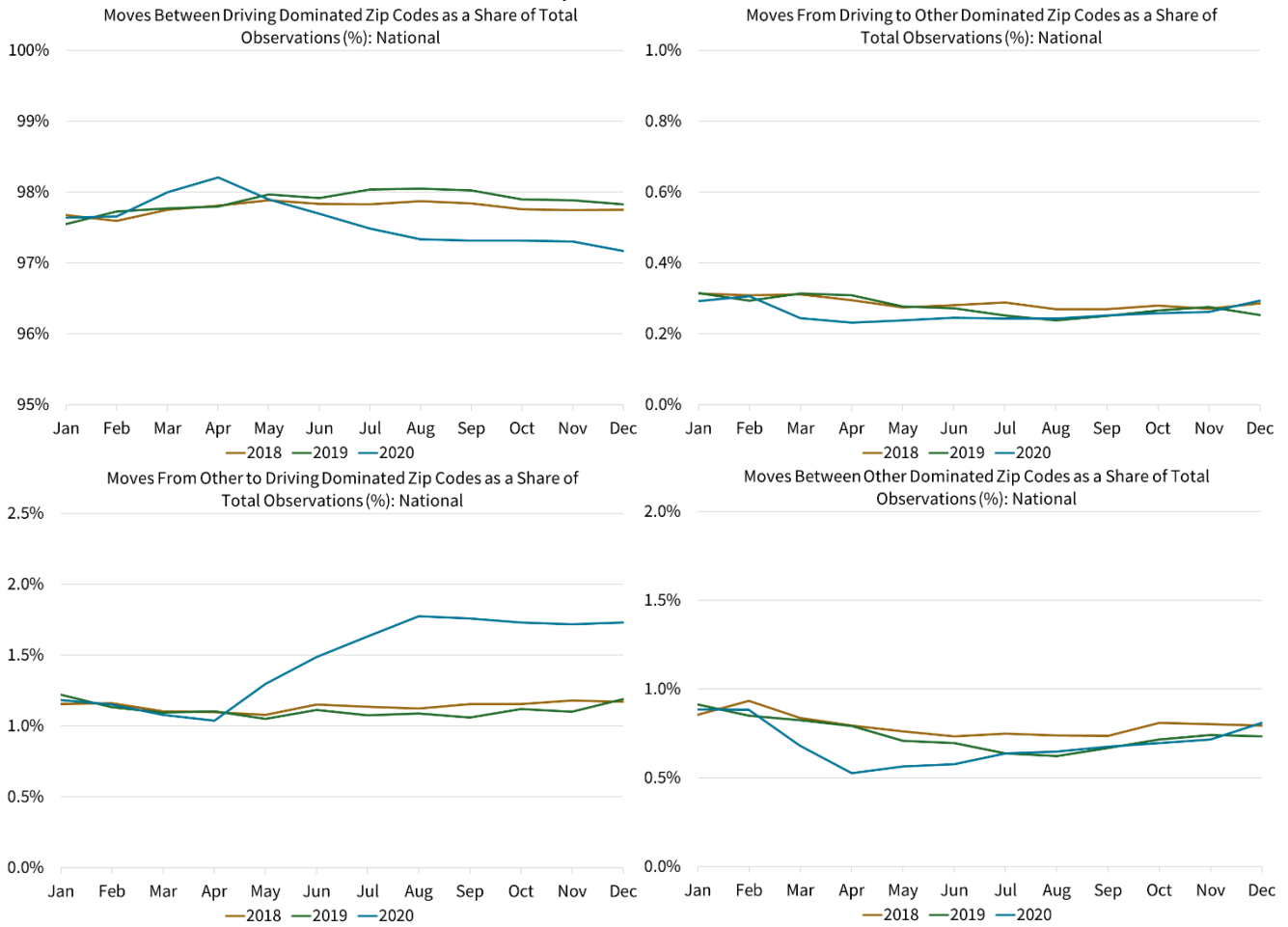


Figure A2 – Shares of DU Applications for Moves by Zip Code’s Predominant Housing Type – Single-Family (SF) or Multifamily (MF) – All Applications



Note – Zip Code’s predominant housing type determined using American Community Survey 2015-2019 5-year estimates of housing units by property type.

Figure A3 – Shares of All DU Applications for Moves by the Primary Means of Commute by Workers in a Zip Code – Drive a car (Drive) or other forms of transportation (Other)



Note – Classification of zip codes by workers’ primary means of commute determined using American Community Survey 2015-2019 5-year estimates.

Figure A4 – Shares of All DU Applications for Moves by Zip Code’s Relative Population Density – Applications from NYC CBSA

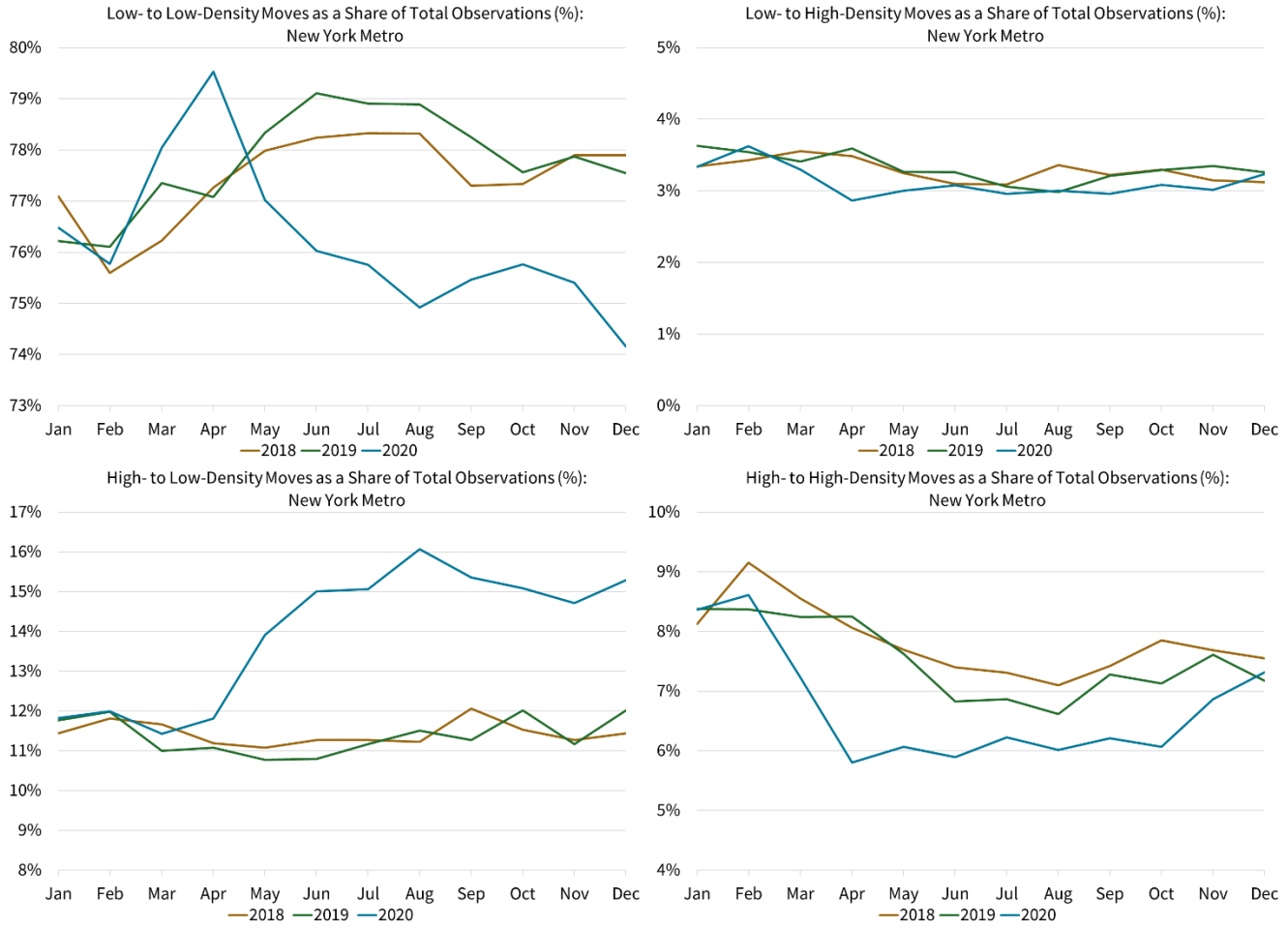
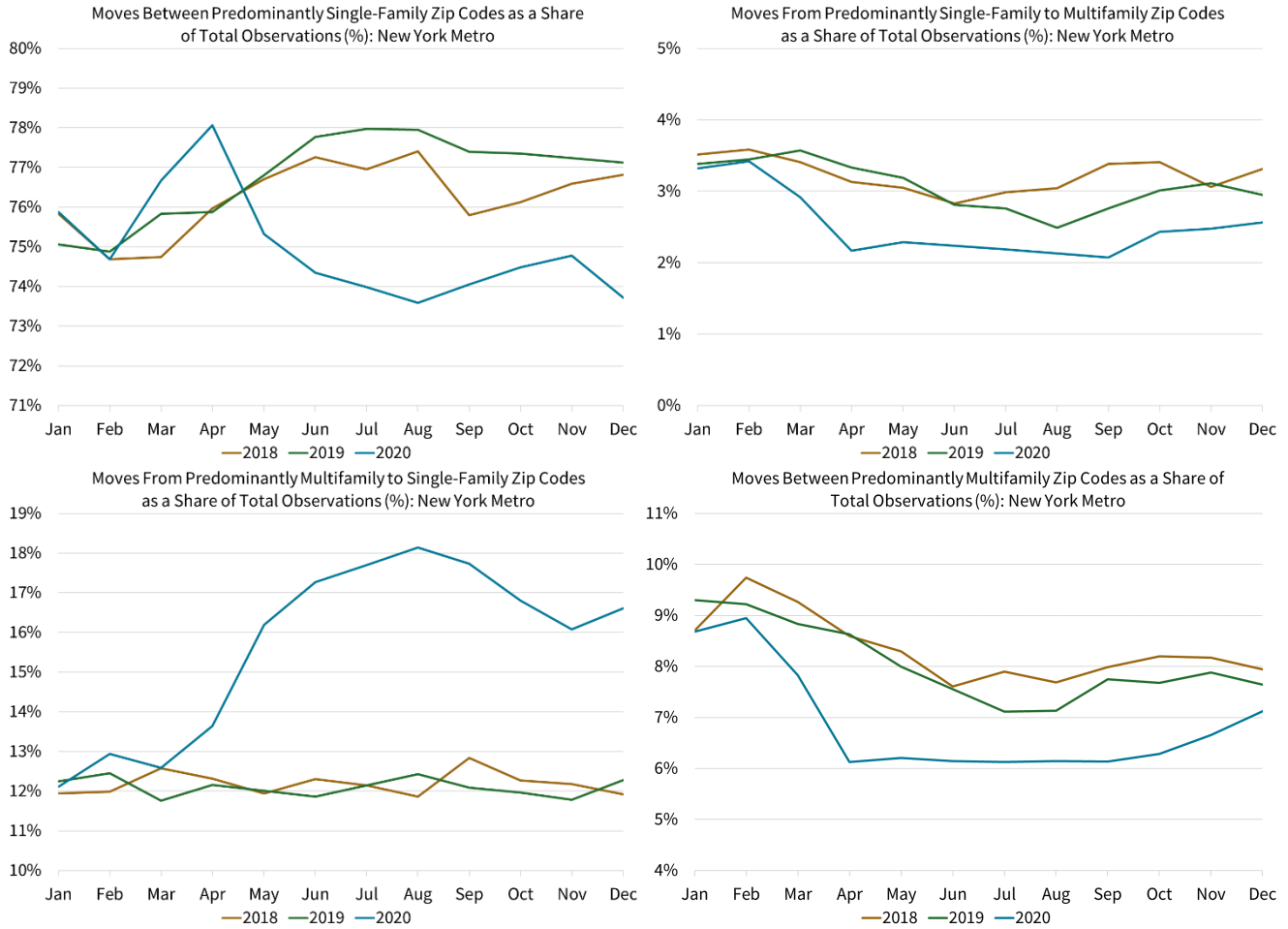
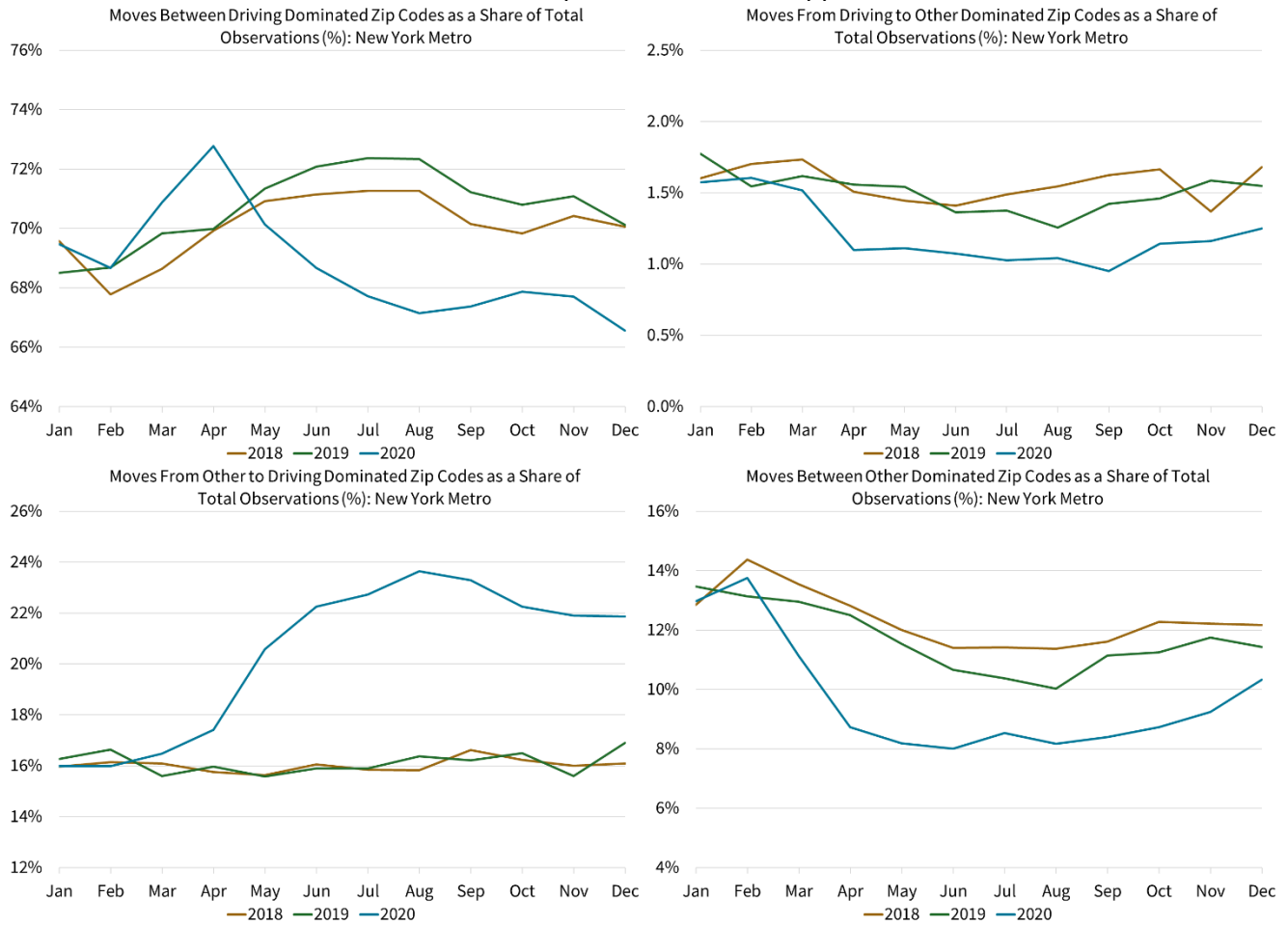


Figure A5 – Shares of DU Applications for Moves by Zip Code’s Predominant Housing Type – Single-Family (SF) or Multifamily (MF) – Applications from NYC CBSA



Note – Zip Code’s predominant housing type determined using American Community Survey 2015-2019 5-year estimates of housing units by property type.

Figure A4 – Shares of All DU Applications for Moves by the Primary Means of Commute by Workers in a Zip Code – Drive a car (Drive) or other forms of transportation (Other) – Applications from NYC CBSA



Note – Classification of zip codes by workers’ primary means of commute determined using American Community Survey 2015-2019 5-year estimates.

Figure A6 – Shares of All DU Applications for Moves by Zip Code’s Relative Population Density – Applications from San Francisco CBSA

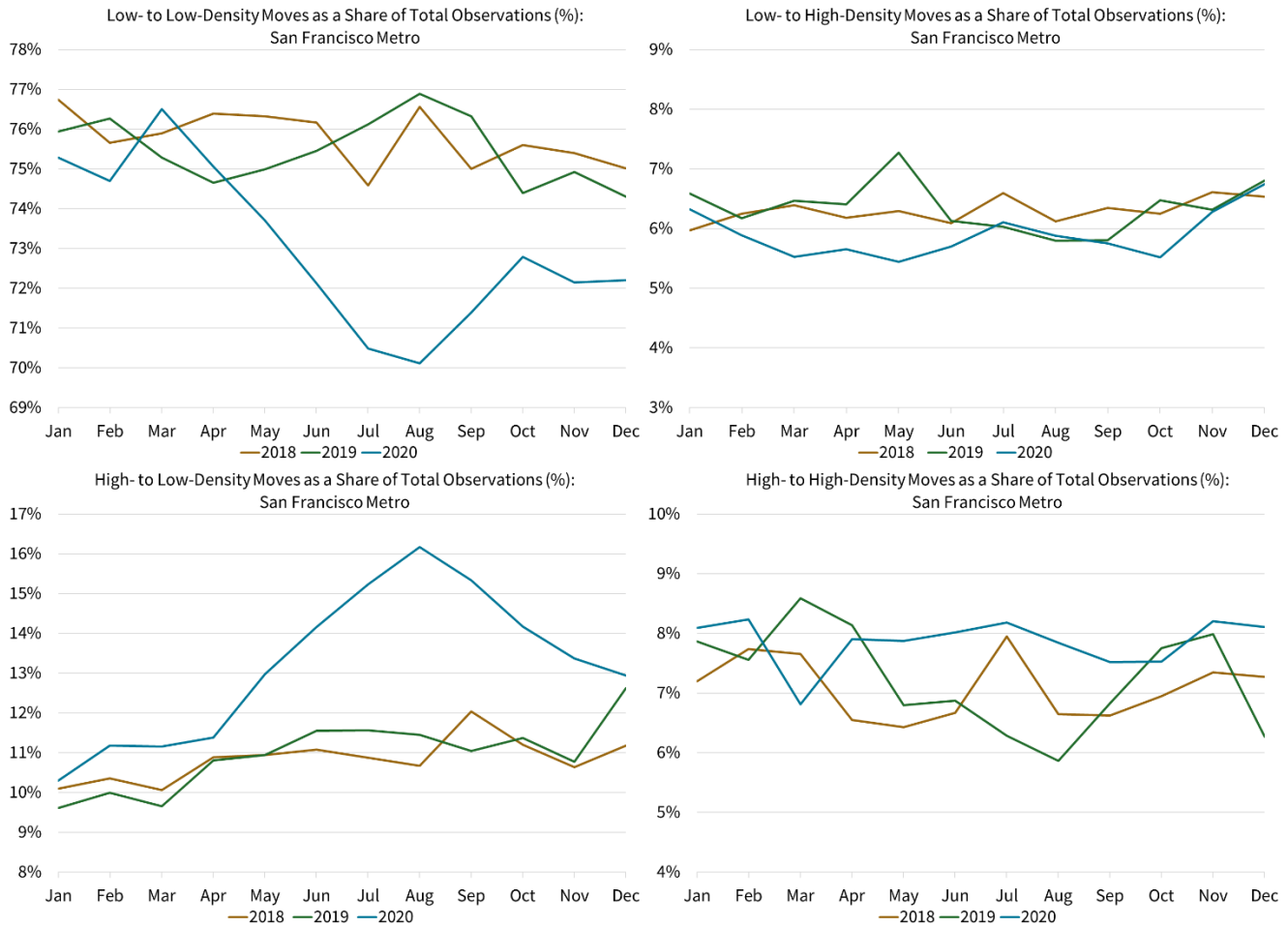
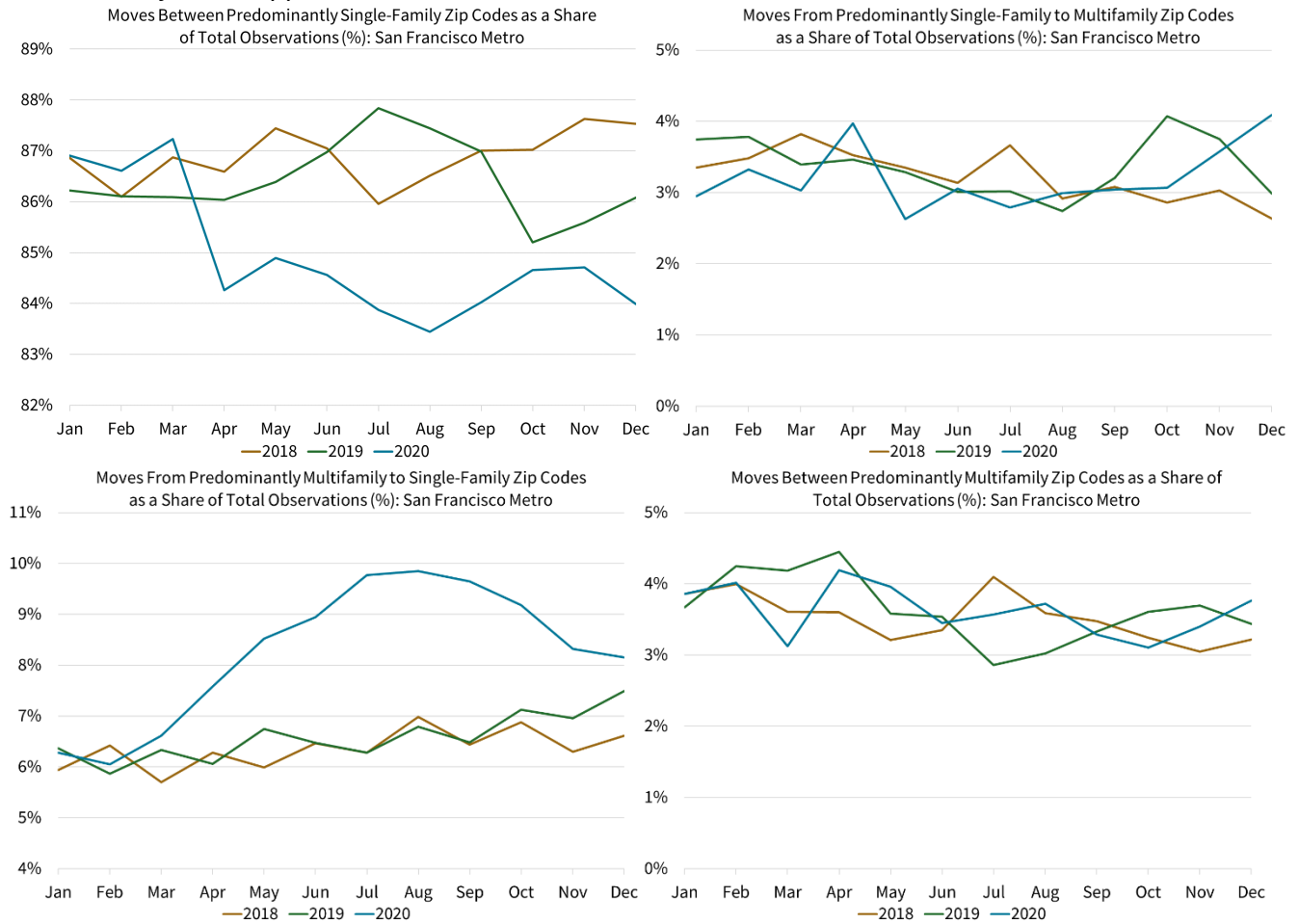
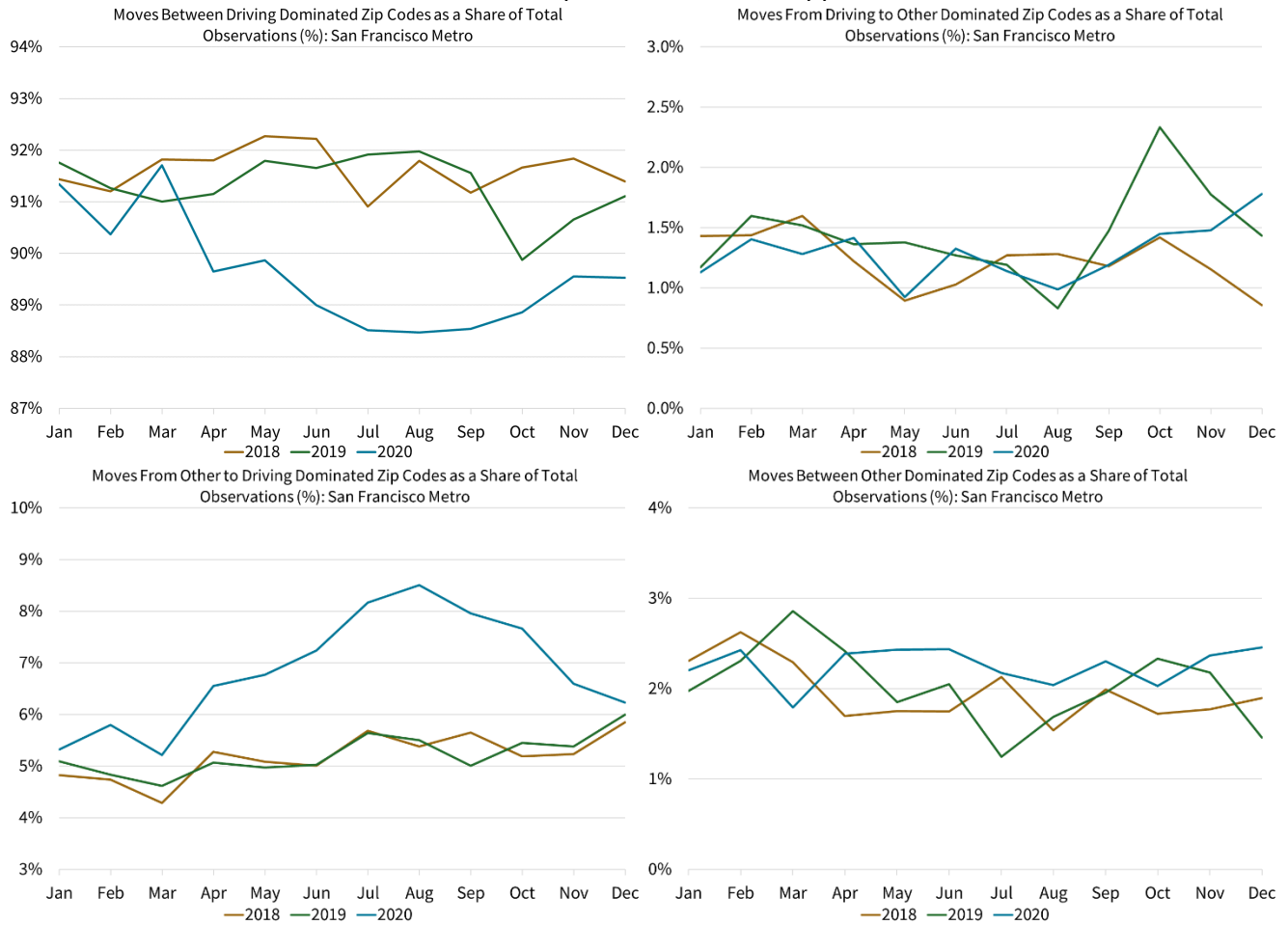


Figure A8 – Shares of DU Applications for Moves by Zip Code’s Predominant Housing Type – Single-Family (SF) or Multifamily (MF) – Applications from San Francisco CBSA



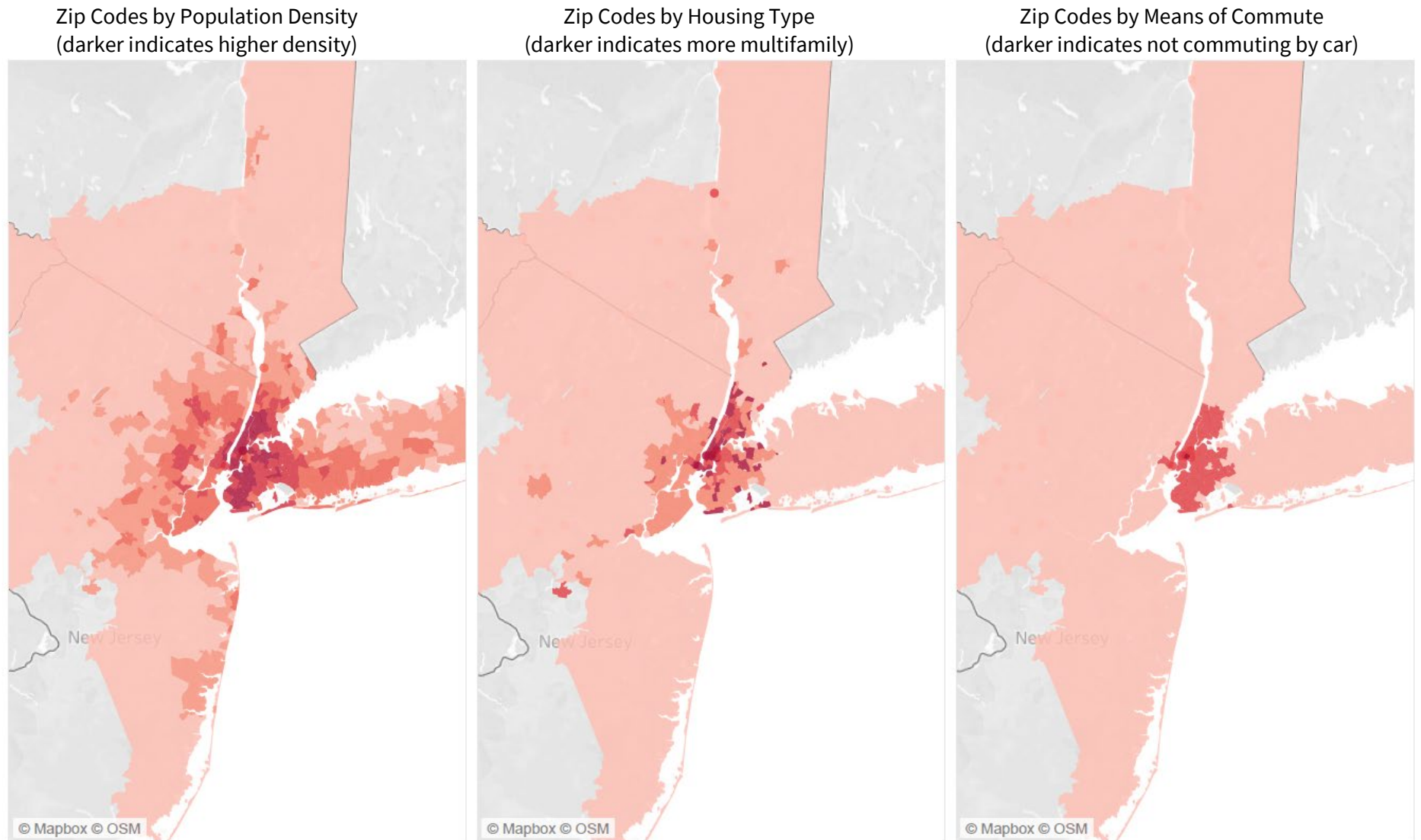
Note – Zip Code’s predominant housing type determined using American Community Survey 2015-2019 5-year estimates of housing units by property type.

Figure A9 – Shares of All DU Applications for Moves by the Primary Means of Commute by Workers in a Zip Code – Drive a car (Drive) or other forms of transportation (Other) – Applications from San Francisco CBSA



Note – Classification of zip codes by workers’ primary means of commute determined using American Community Survey 2015-2019 5-year estimates.

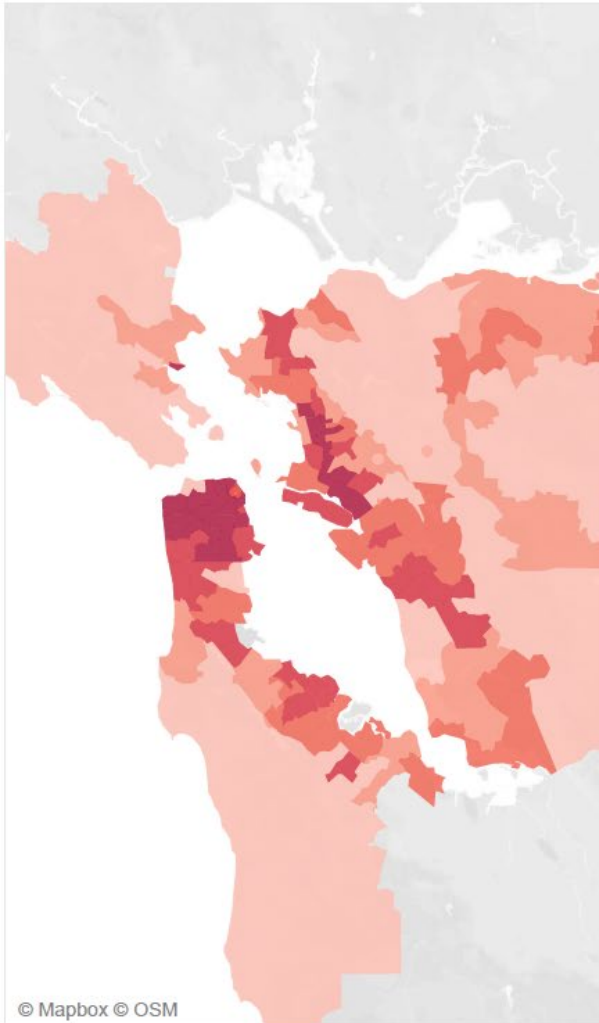
Figure A10 – Contrasting Zip Code Classification Schemes for NYC CBSA



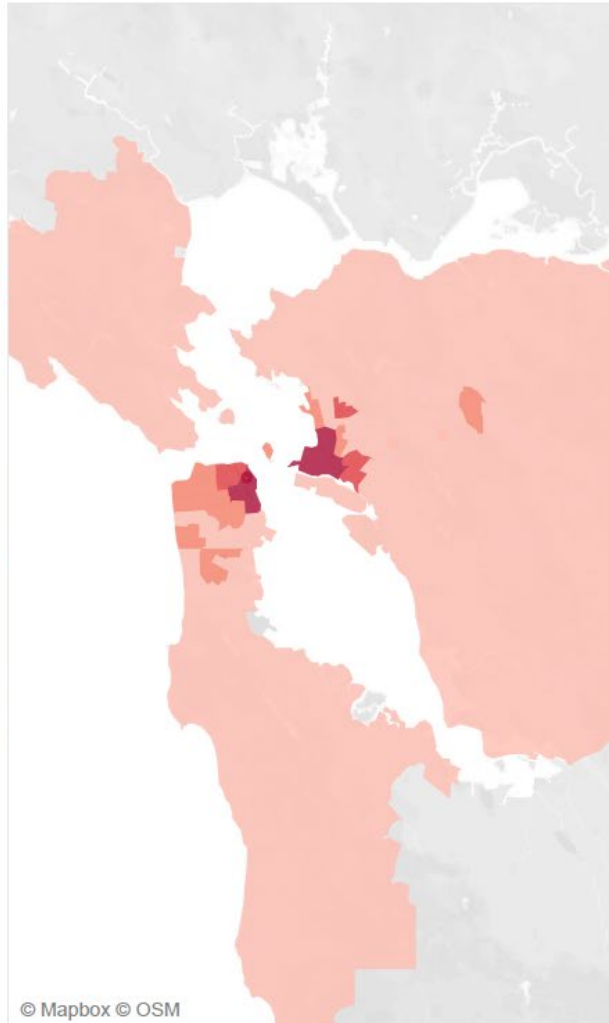
Source: American Community Survey 5-year estimates 2015-2019

Figure A11 – Contrasting Zip Code Classification Schemes for San Francisco CBSA

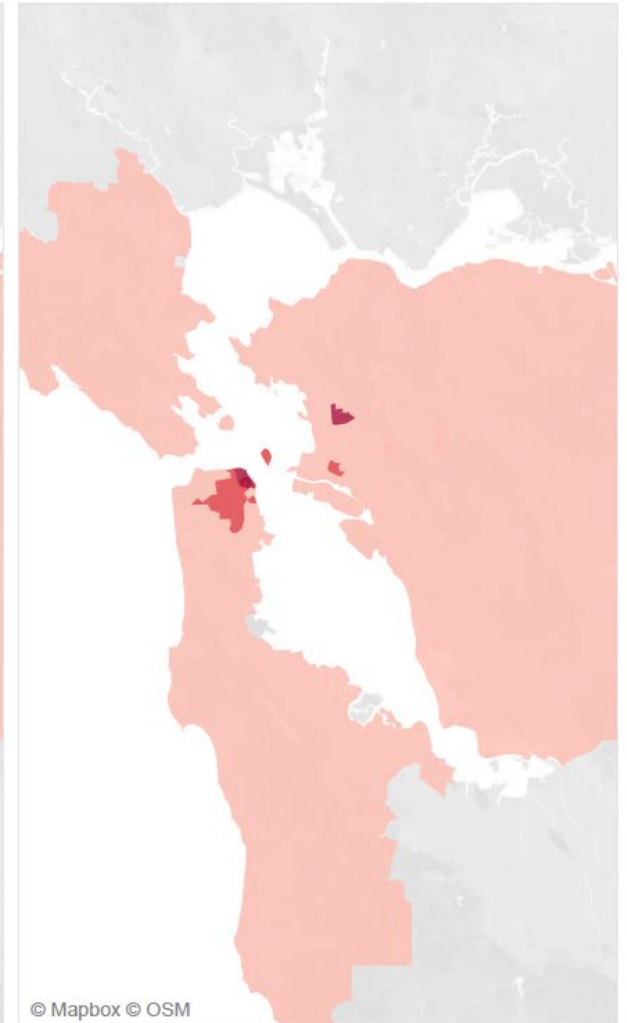
Zip Codes by Population Density
(darker indicates higher density)



Zip Codes by Housing Type
(darker indicates more multifamily)



Zip Codes by Means of Commute
(darker indicates not commuting by car)



Source: American Community Survey 5-year estimates 2015-2019