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**Measuring the Length of the Housing Development Review Process in San
Francisco**

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PROFESSIONAL REPORT

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APPROVED

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Table of Contents

1. Introduction	3
2. Background	5
2.1 The Pros and Cons of Development Review	5
2.2 Overview of San Francisco's Permitting and Development Process	7
2.3 State and Local Policies to Address Housing Permit Streamlining	10
3. Methodology	13
4. Results	14
4.1 Final Sample	14
4.2 Development Time to Completion by Project Stage	16
4.3 Variation in Times to Completion by Project Size, Neighborhood	19
5. Conclusions/Policy Implications	27
6. Bibliography	30
Appendix 1. Summary of San Francisco Housing Development Review Process	32
1. Pre-Application Process	32
2. Application Submission and Review	33
3. Additional Discretionary Review	37
4. Post-Entitlement Review (Review by Other Agencies)	40
Appendix 2. Summary of Methodology	41

1. Steps 41
2. Assumptions 43
Appendix 3. Affordable v. Market-Rate, Within Area Plans v. Outside Area Plans 45
3.1 Process of Merging in Affordable Housing Data 45
3.2 Results 46

1. Introduction

Proponents of expanding housing supply in the Bay Area commonly cite the need to relax zoning laws as the primary way to increase development and thus, ease housing costs. While upzoning urban areas is certainly a key piece to housing policy reform, policymakers and academics have recently turned their attention to a less well-studied phenomenon—the long and bureaucratic permitting review process. This process can be a significant impediment to housing development, costing hundreds of thousands of dollars and adding significant uncertainty to project timelines.

While it is common for many American cities to have “by right” zoning that gives stamped approval to developments that meet zoning requirements, many California cities lack an administrative approvals process. Instead, cities individually scrutinize each new development—a process known as discretionary review—adding layers of costly review to even modest development proposals. Perhaps nowhere is this process more lengthy or complex than San Francisco, where it is virtually impossible to build new housing—no matter how small—without a public hearing. Despite the significant impacts of this review process, there is no comprehensive accounting of just how long the process takes. This information—when, where, and under what circumstances development review takes the longest—is critical for policy-makers considering redesigning the housing review process to allow for permit streamlining.

Brian Goggin

In this paper, I estimate the lengths of various stages of the official permitting review and post-review construction process for a sample of 2,474 housing developments between mid-2009 and early 2017. Because this sample excludes projects under development that did not receive either a building permit or complete construction during this time period, it likely underestimates average development review times and overall development times. Furthermore, I do not measure development review time before the official submission of entitlement applications, such as community meetings or feasibility studies, which could add substantially to total development time. Despite these weaknesses of the data, to my knowledge this is the first attempt to comprehensively account for housing development review and construction time in the city.

While the data makes it difficult to say much with certainty, the most surprising results below show that mid-sized developments (i.e. 10-50 units) do not take any less review time than much larger developments, which presumably have much larger impacts on the environment.

This is consistent with an overall pattern of underproduction of mid-sized developments throughout the city, a phenomenon sometimes called the “missing middle” in the media and other academic work. These results suggest that there is large potential in permit streamlining for mid-sized developments, which are much cheaper to construct and so could have a dramatic impact on the production of affordable housing in the city.

The paper proceeds as follows: Section 2 describes permitting review policies and the development process in San Francisco. Section 3 gives an overview of the approach I have taken to estimate housing development times to completion, including the key

Brian Goggin

measures of interest. Section 4 gives an overview of what the data says, specifically in terms of different stages of the development process and how review and development time differ between development types and locations. Finally, Section 5 concludes with a consideration of what the results from this analysis tell us about the potential effectiveness of recent local and state policies to streamline housing development. Appendix 1 provides a detailed review of the San Francisco housing permitting review process, while Appendix 2 provide exploratory regression analysis to model relationships between neighborhood characteristics and time to completion. Appendix 3 provides a more in-depth summary of the data gathering and cleaning process.

2. Background

2.1 The Pros and Cons of Development Review

There are some good reasons for in-depth housing development review. It's important that any new housing be safe, have a high quality design, and cause little disruption to the surrounding community, and the San Francisco review process mandates careful examination of these issues. However, this review also takes time and time is costly, not only for the developer but also for the public at large. Additional project review time delays the housing market's response to high demand, increasing housing prices for everyone. Empirical evidence from economics research has confirmed the costliness of inadequate housing supply, estimating that it has lowered aggregate US growth by more than 50% from 1964 to 2009 (Hsieh and Moretti 2017). Perhaps nowhere is this dramatic imbalance between demand and supply more evident than San Francisco, which been adding tens of thousands of new jobs each year while at the same time only

Brian Goggin

adding between two and four thousand new housing units annually (Moretti 2013). No segment of the city's housing production lagged behind as much as moderate-income housing for those earning 80%-120% of the area median income. Overall, San Francisco produced only 1,483 permits for this income group, less than 10% of the amount permitted for above-moderate income residents and less than 18% of the state-mandated goals (ABAG 2015). This has forced many moderate-earning families to live in cramped living quarters meant for students or young professionals or move out of the city altogether (Pender 2017). As the accounting of housing permitting review times below demonstrates, the city subjects mid-sized residential buildings—many of which are less costly to build and so ideal for moderate-income earners—to the same lengthy review process as much larger apartment buildings.

The housing review process is not all to blame for San Francisco's dramatic housing costs. After all, the city has strict zoning regulations that dramatically limit the total amount of possible housing. However, even when developers follow zoning rules, the city's review process requires discretionary review for most new housing developments. This means that the city's Planning Commission—a 7-member board appointed by the Mayor and Board of Supervisors—has the authority to review, judge, require changes of, or disapprove of a development even if it meets the quantitative standards of the zoning code. This process adds time, uncertainty, and costs, which are often then passed on to consumers in the form of higher rents. In fact, recent research that interviewed housing developers in San Francisco has shown permitting and review time to be one of the most significant drivers of housing construction costs in the city. Many large developers have hired private "expeditors" or built in additional contingency costs

Brian Goggin

in order to deal with the city's review process (Reid and Raetz 2018).

2.2 Overview of San Francisco's Permitting and Development Process

How is it that most housing developments in San Francisco necessitate in-depth review rather than just administrative checks that they meet the zoning code? The city's charter contains a single line that permits the city's planning commission to review projects "at its own discretion" (Shigley and Fulton 2012). As a result of this broad language, the city's permitting process is designed to give maximum discretion to the government to intervene in development decisions. This permitting process has dozens of stages, many of which can trigger discretionary review if a development raises a red flag. There are so many layers to this process that it is virtually impossible to add a residential unit that fits the zoning code without some level of individual scrutiny. As I describe below (and in more depth in Appendix 1), mid-sized developments (10-50 units) are just large enough so that they normally take the full brunt of this extensive review process.

To start the process, developers usually first undergo a preliminary review process at the Planning Department that is required for projects adding 7 or more units. During this preliminary review, the project sponsor submits an application known as a "Preliminary Project Assessment" (PPA), which the department uses to provide their initial feedback. This usually consists of concerns for the sponsors to address before submitting a formal application, as well as an outline of the expected review process (i.e. meetings and hearings) that a project will have to undergo (The PPA Process | SF Planning Department). After the PPA feedback, developers usually conduct community outreach—either required or merely recommended—for the project.

After extensive oversight during preliminary review, project sponsors submit their first

Brian Goggin

official project applications to undergo the formal Planning Department review process.

This process consists of two stages: planning code compliance review (i.e. does the project meet the zoning code and general plan?) and environmental review (i.e. does the project pose any environmental threats?) and (SF Planning 2011).

Planning code compliance review, also called “entitlement review”, consists primarily of planning staff ensuring that the project meets the zoning code. However, projects can often require additional layers of discretionary review, such as needing a zoning variance, conditional use permit, or historic preservation considerations. These oftentimes necessitate public hearings by the zoning administrator, historic preservation commission, or the planning commission. Furthermore, many zoning designations require conditional use authorization for any project above a certain size even though it meets other quantitative restrictions of the zoning code. For example, many zones have lot size limits that trigger conditional review if exceeded (Planning Code section 121.1). Many of these are quite small (e.g. 2,500 square foot limit for North Beach), and so trigger conditional review for most housing developments that increase density—even if the increase is only slight.

In addition to planning code compliance review, environmental review can take months to years of planning staff review, consultant studies, and consequent alterations to the project depending on the project’s complexity. At the very least, most sizeable developments (over 10 units) necessitate an initial study, which usually takes 1-2 months. However, the environmental review process can take up to 22 months for large projects—or longer if concerned citizens or interest groups file lawsuits under the California Environmental Quality Act (CEQA).

Brian Goggin

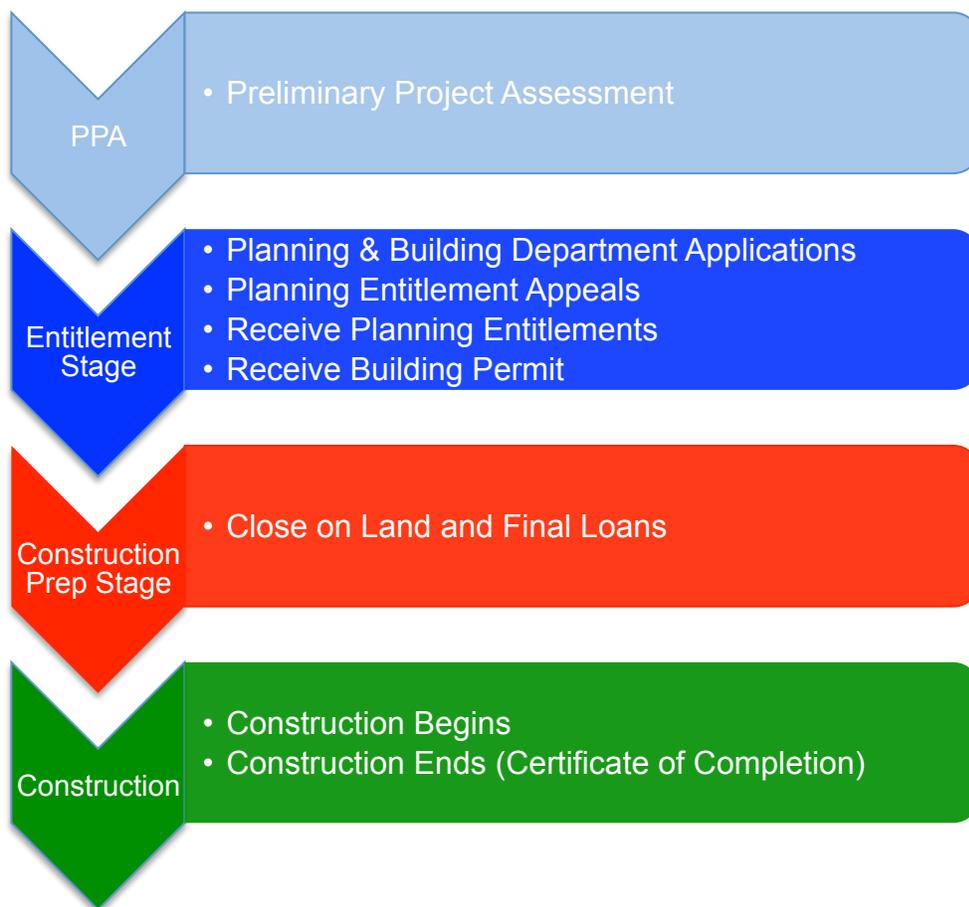
Ultimately, the review process usually culminates in a public hearing, where the Planning Commission approves or denies both the environmental and entitlement applications. If approved, the project has received official approval from the city (often known as simply “entitlements”). After this decision, a member of the public can appeal the decision to the Board of Supervisors, which may render its own entitlement decision. Due to the uncertainty of the permitting review process, developers usually have option contracts with the land seller. These contracts require expensive deposits, allowing developers to pay some money down to hold the project site off the market until the receipt of government approval. After a project receives entitlements, the developer usually closes on the land acquisition and finalizes financing for the project. Concurrent with this process, developers must seek building permits from the Department of Building Inspection (DBI), which ensures that the project is up to the building code. This is typically ministerial in nature and requires one-time review and stamped approval. Finally, a project may proceed with construction after receiving building permits. At the end of the construction process, DBI will again inspect the building to verify that it is up to the standards of habitation and render a final “Certificate of Completion” (CFC), which deems the project habitable by the public. In the analysis below, I consider the date of receipt of the CFC as the completion date for housing developments.

In Sections 3 and 4 below, I use data on a sample of development projects in progress between mid-2009 and 2017 to estimate the length of the permitting and development process described above. Unfortunately, the data quality is not sufficient to analyze each component of this development process due to the lack of key project dates. However, I am able to measure the length of the following stages of the development

process: 1) entitlements stage, or the time from official permitting application submission to receipt of building permits 2) the time between the receipt of building permits and the start of construction—what I call “construction prep” stage—and 3) the time between the start of construction and the issuance of the certificate of completion.

Figure 1 illustrates these three stages graphically.

Figure 1. Stages of the Development Process



2.3 State and Local Policies to Address Housing Permit Streamlining

Efforts to speed up the permitting process—both at the state and local level—are not new. In 1977 the state passed the Permit Streamlining Act, which requires cities to make final determinations on a project within one year of the point of complete

Brian Goggin

application submittals. If they do not, the development can be deemed “approved” under state law (Shigley and Fulton 2012). Unfortunately, there are a number of reasons this law has been mainly ineffective at reducing permitting times. First, this law’s enforcement depends on litigation by the project sponsor. However, suing the city you are operating in is dangerous for future reputation, and is thus, deemed a measure of last resort. Second, cities can find a way around the law by temporarily denying the project within the Permit Streamlining Act deadlines, only to take more time reviewing a project before rendering a final decision but after the deadline has passed (Eastman, n.d.). As a result of these shortcomings, the law largely lacks teeth in San Francisco, where recent audits of the Planning Department have shown project review often takes longer than one year. Moreover, the department does not collect the necessary data—most notably, the date of a project sponsor’s application completeness—to measure compliance with the Permit Streamlining Act . More recent policies in San Francisco have had more success. Notably, housing advocates have worked with the Planning Department to introduce a number of specific area plans (e.g. Market & Octavia Plan or the Eastern Neighborhood Plan) that contain area-wide environmental impact reports for all developments in the near future (SPUR 2006). This allows for streamlined environmental review for future projects in these areas.

Most recently, the state passed SB 35, aimed at streamlining affordable housing approvals, in 2017. This law mandates ministerial approvals for developments within categories for which jurisdictions that are not meeting their regional housing goals as part of the state’s Regional Housing Needs Assessment (RHNA) process. Ministerial approvals means that the project would not be up to the discretion of the jurisdiction if it

Brian Goggin

meets the zoning code, and so the jurisdiction would not be able to require environmental review, conditional use authorization, or other types of discretionary review. In the case of San Francisco, the city has not been meeting its RHNA goals for housing for people at 80% or below of the area median income. Therefore, projects that provide on-side affordable housing for these groups can apply to receive streamlined, ministerial approval under SB 35 (Rahaim 2017). Although this law has enormous potential, there are a number of stipulations, such as historic building exceptions, requirements to pay prevailing wages, and exceptions regarding the demolitions of existing residential units, that limit its scope.

Also in 2017, SF Mayor Ed Lee issued an executive directive focused on speeding up the housing permitting review process (Executive Directive 17-02). This directive sets concrete approval deadlines within which to render entitlement decisions. These decision deadlines are between six and twenty-two months depending on the complexity of the necessary environmental review, which is typically the most time-consuming part of the process. Furthermore, it sets a deadline for issuing building permits within one year of receipt of entitlements and submission of building permit applications. The rationale for this policy is twofold: 1) to decrease permitting times and 2) to decrease uncertainty in the review process, a typical source of anxiety for developers. Unlike SB 35, this directive focuses on internal process improvements rather than a reduction in process requirements, which typically require legislative change.

In Sections 3 and 4, I describe the process of accumulating data to measure how long different stages of the permitting review and development process take along with an

Brian Goggin

initial look at the data. In Section 5, I conclude with what the results of this analysis might tell us about the effectiveness of recent state and local policies for speeding up housing development review.

3. Methodology

Currently, there is no single dataset that can measure the length of the housing review and development process. In order to do so, I append together multiple cross-sectional datasets from the San Francisco Planning Department.¹ The primary datasets I use are the development pipeline datasets, quarterly reports of all development projects that add either units or non-residential square footage to the city's building stock. This data includes rich enough information to determine the length of the entitlement process (planning and building permit review), the length of time between entitlements and the start of construction, and the length of construction time itself. It also includes information about the project size and location.

Although the dataset has a rich amount of information, I need to make a number of simplifying assumptions to make the data usable. First, I create a definition of a unique housing development in the data. Unfortunately, there is no unique id for the developments. Instead, I identify unique developments as unique address-parcel filed combinations. Although it is theoretically possible that there could be more than one housing development on a single address-parcel combination, after data cleaning I do not find any duplicate address-parcel-first date filed combinations, so this does not impact the accuracy of the results. Next, I needed to measure the start date of the

¹ My data construction and cleaning process built on the earlier work of volunteers at Code for San Francisco, including Sanat Moningi, Jeff Quinn, and Tyler Field. I thank them for their efforts.

Brian Goggin

development. Because the data lacks any information on the preliminary review process, I identify the project start date as the earliest of either the first official Planning Department or DBI (building permit) application. Finally, the data does not include any information on the project end date, and so I must also make an end date assumption. Developments “drop out”, or fail to appear, in the pipeline datasets in the quarter in which they receive their certificate of occupancy (San Francisco Pipeline Report 2014). Because of this, I assume that a development is complete on the first day of the quarter that it fails to appear in the pipeline datasets any longer after being listed as “under construction” in its latest appearance in the data.

The dataset is extremely error-prone. Based on conversations with the Planning Department staff, this is because staff must make manual data entries of application information, and in this process they often make mistakes or omissions. Aware of these errors, Planning Department staff manually curate the development pipeline datasets in the hopes of catching some of these errors. To the best of my ability, I have conducted a data cleaning process in the process of gathering the data to mitigate any effects of systematic data error. Despite this, there are likely still inaccuracies with individual data entries. Detailed data cleaning steps and assumptions can be found in Appendix 2 below and are documented in the code itself online, which can be found on Github (username: brgoggin).²

4. Results

4.1 Final Sample

After appending and cleaning the development data in the process described above, I

² <https://github.com/sfbrigade/datasci-housing-pipeline>

am left with a sample of 3,081 projects that were at some stage of development within the sample time period (Q3 2009 to Q2 2017). Next, I reduce this sample to 2,793 after filtering out observations without a date of first entitlement application. Then, I reduce the final sample to 2,474 after filtering out observations with duplicate building permit observations. Of these, 706 reached completion at some point within our sample period, 1,089 have an identifiable “entitlement stage” (i.e. permitting review), 650 have an identifiable “construction prep” stage, and 721 have an identifiable construction stage. These categories are not mutually exclusive—for example, some projects that have reached completion may or may not also have an identifiable entitlement stage. Table 1 below summarizes the final samples used for the analysis.

Table 1. Final Sample of Developments

Sample	Number
1. Sample of residential projects between Q3 2009 and Q2 2017	3,081
2. Sample of those with identifiable first dates	2,793
3. Sample of those without duplicate building permits (final sample)	2,474
4. Number in final sample with identifiable end date (i.e. reached completion)	721
5. Number in final sample with identifiable “entitlement stage”	1,089
6. Number in final sample with identifiable “construction prep” stage	650
7. Number in final sample with identifiable construction stage	721

It is important to note that the results from this final sample likely underestimates true development times because it does not include some projects that were under development but were filtered out because of missing dates. For these projects, it is likely that the length of the development process was so long that it there was no

Brian Goggin

observable change in project status over the sample period (Q3 2009 to Q2 2017). Furthermore, as described above, this data does not measure the length of the preliminary review process prior to the submission of the official permitting review application. Despite these limitations, the results below illustrate important lessons about variation in review time between different stages of development, projects of different size, and projects in different areas of the city.

4.2 Development Time to Completion by Project Stage

Figure 1 below shows the distribution of projects by total time to completion in years.

The median time to completion for these housing projects is about 3.8 years—meaning over half reached completion within 4 years of submitting applications. Despite this,

there are a sizeable amount of projects that take more than 10 years—the maximum taking 24 years. The bunching below 5 years in this histogram is partially because this

includes all housing developments without regard to their unit count. As a result, there are likely many 1-2 unit projects below the 5 year point and many large apartment

buildings—the majority of additions to the city’s housing stock—above 5. Instead, Figure 2 shows a histogram of time to completion for housing developments that included 10 or

more new units. As expected, these large projects have a much greater median time to completion of about 6 years.

Figure 1. Housing Time to Completion, n=721

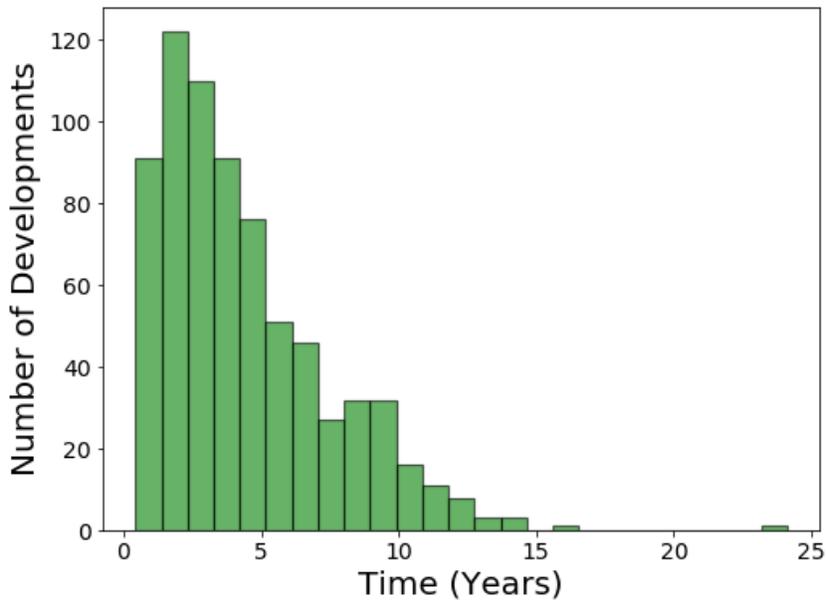
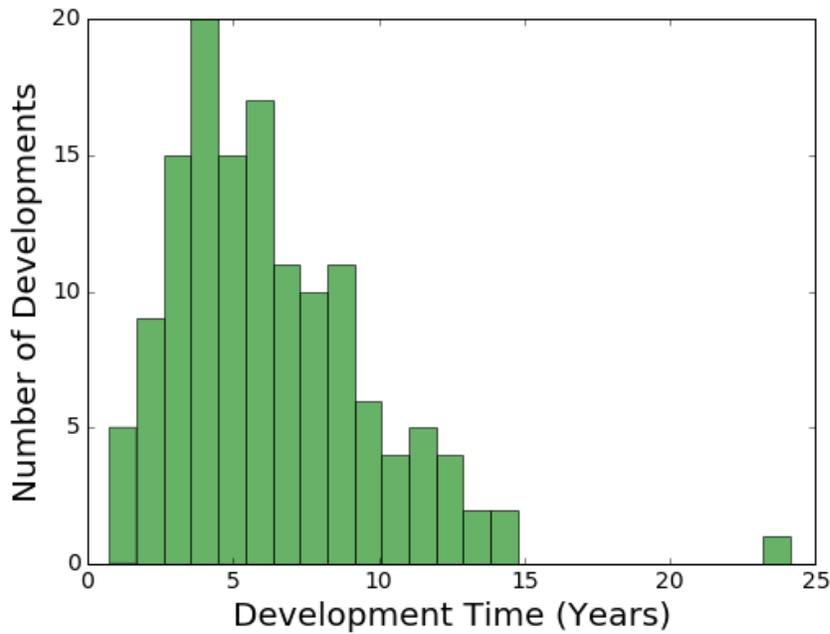


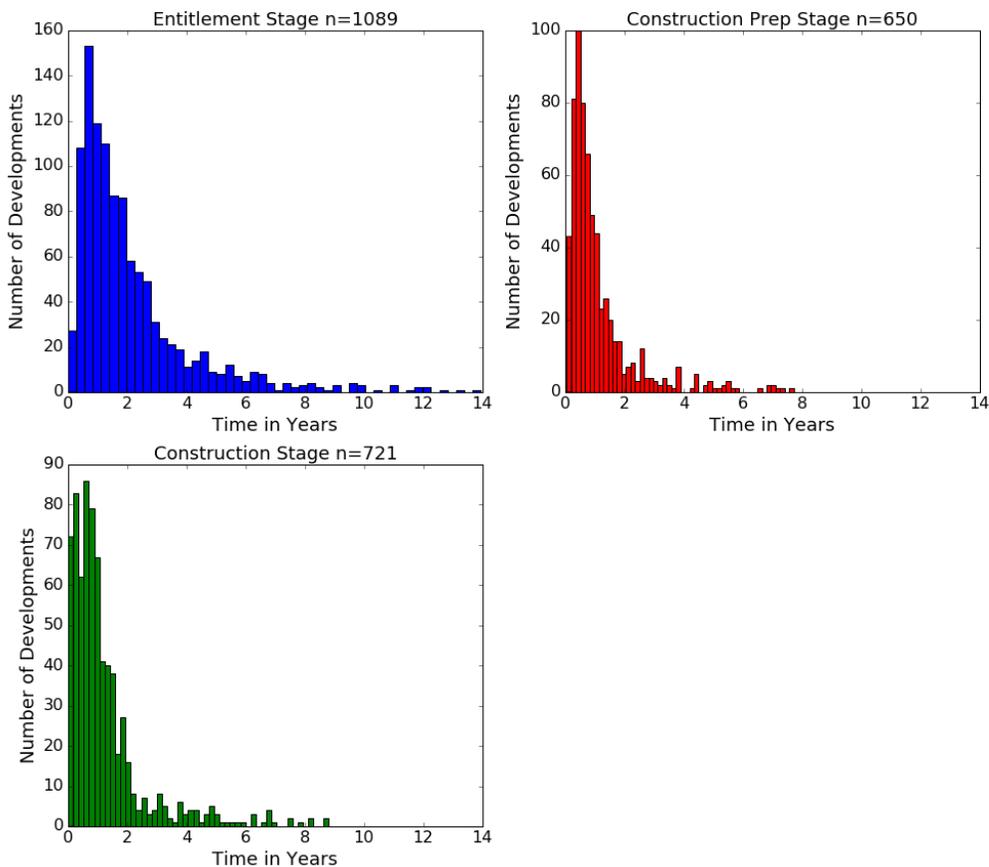
Figure 2. Housing Time to Completion: >10 Units, n=137



In addition to total time to completion, we can measure three separate stages of the development process with this data: 1) the entitlement stage, or the time from submission of planning or building permit application to receipt of building permits 2)

what I call the construction prep stage, or the time between receipt of planning and building entitlements and the start of construction and 3) the construction stage. Figure 3 contains histograms for the lengths of all three of these project stages and contains varying sample sizes depending on how many projects contain this information. The figure shows that the entitlement stage tends to be the longest stage and also has the most variation between developments. While most construction prep and construction stages are less than 2 years, entitlement stages are oftentimes much longer—between 2 to 4 years or more.

Figure 3. Time to Completion by Stage



4.3 Variation in Times to Completion by Project Size, Neighborhood

What could explain the variation in times to completion shown in the figures above? It's easy to think of a few factors, most notably the size of the development. Figure 4 draws a scatter plot of total time to completion against the numbers of units added, which is the best indicator of project size available in the data. There is some but no significant positive correlation between units and development time. Next, I break down median development time by some common unit-size categories in Figures 5 and 6. As expected, small developments (those with 1-10 units) have the shortest completion times. However, the rest of the unit size categories appear to have similar median completion times. This is particularly interesting considering the fact that mid-sized 10-50 unit developments have much less impact on the surrounding environment than developments twice or more their size. While these results could be partly skewed by outliers in the low sample sizes of some of these categories, I mitigate some of the effect of outliers here by using median rather than average time to completion. Figure 6 shows time to completion by the same unit-size categories of Figure 5, but instead by 3 distinct stages of the development process rather than the full time to completion. Again here we can see that most variation in development time comes from the first stage: the entitlement process. Furthermore, this stage appears to be the same or longer for mid-sized 10-50 unit projects than large projects adding more than 50 units. The construction prep time—or the time in between receiving building permits and the start of construction—appears to have no significant differences by project size. This is also surprising but outside government control as this is past the point of permitting review. Finally, construction time changes with unit size mostly as we would expect,

Brian Goggin

with larger projects taking more time.

There are a number of interesting findings here, but the most directly relevant to the permitting review process is that the entitlement process is just as long for mid-sized (10-50 unit) developments as it is for much larger units. There are a number of reasons why this might be, both related to the fact that 50-200 unit projects are usually closer to downtown areas than 10-50 unit projects. First, areas closer to downtown are both more likely to lie within area plans eligible for streamlined environmental review. Second, I hypothesize that these areas also have less neighborhood opposition than areas further away from downtown, where there are high amounts of homeowners and wealthy residents. These neighborhood characteristics would give these areas more political clout and also allow residents to be more aware of nearby development.

This finding—that mid-sized projects have just as long of a public review process as much larger (50+ unit) apartment buildings—is also opposite of what we would expect from the permitting process since larger developments have more impact on the surrounding environment, and so presumably merit more scrutiny. Instead, this evidence raises serious questions about the suitability of the permitting process for mid-sized projects, signaling the potential for permit streamlining of these projects.

This also has important implications for the ongoing housing affordability crisis in San Francisco. Not only could the proliferation of mid-sized projects greatly increase the supply of much-needed housing, but these types of projects (usually wood-framed) are also much cheaper to construct than larger apartment buildings (usually built from concrete and steel). For this reason, I argue that the city should seriously consider streamlining permitting for mid-sized developments, either by limiting the amount of

conditionally use authorizations required for these projects or by expanding area plans throughout the city. Many such plans have pre-certified environmental impact reports so that new developments don't usually have to undergo their own environmental review process.

Figure 4. Time to Completion by Units Added n=721

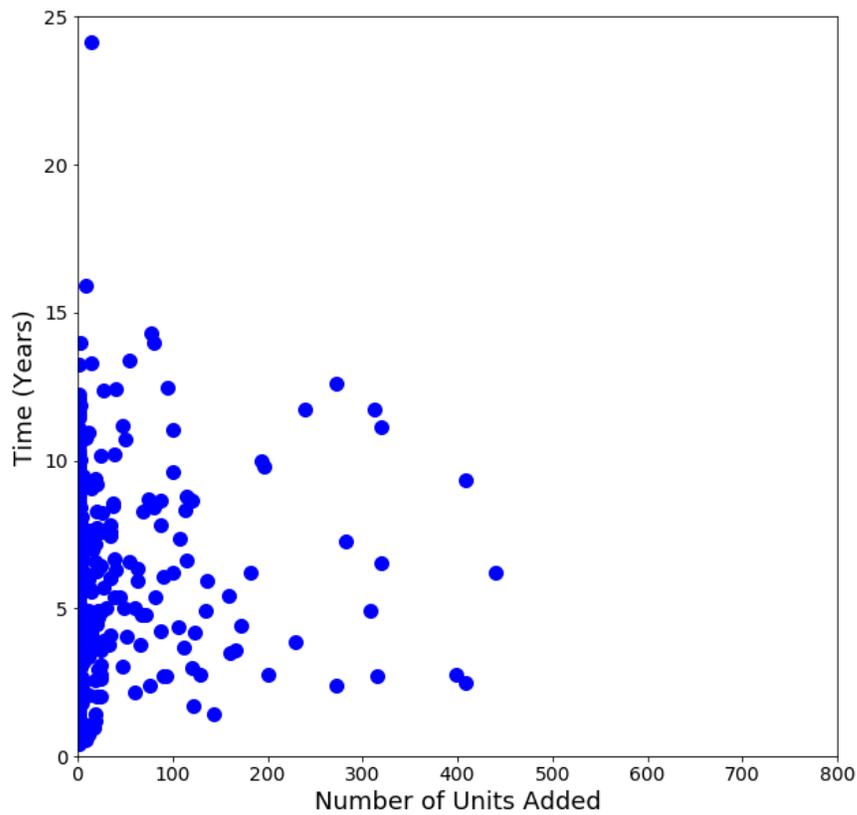


Figure 5. Time to Completion by Size Category (Sample Sizes on Bars)

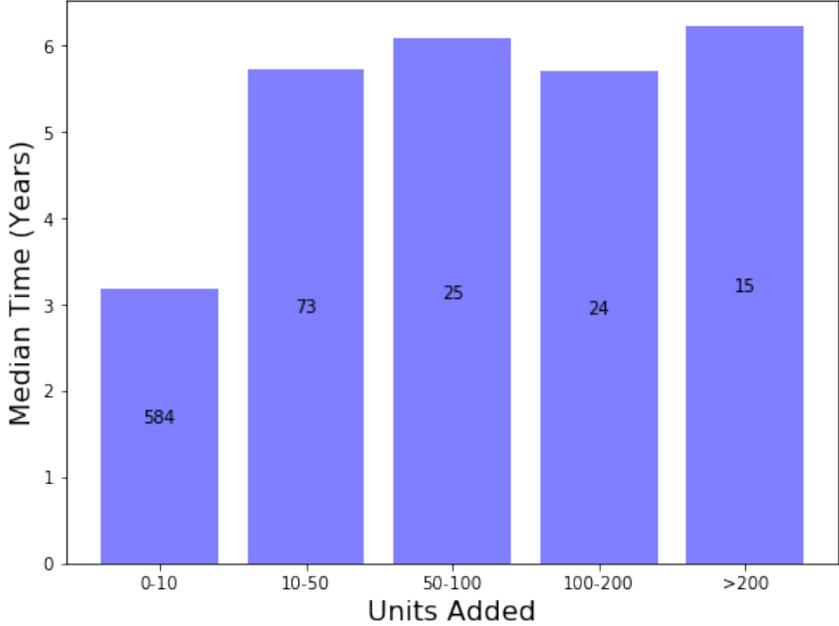
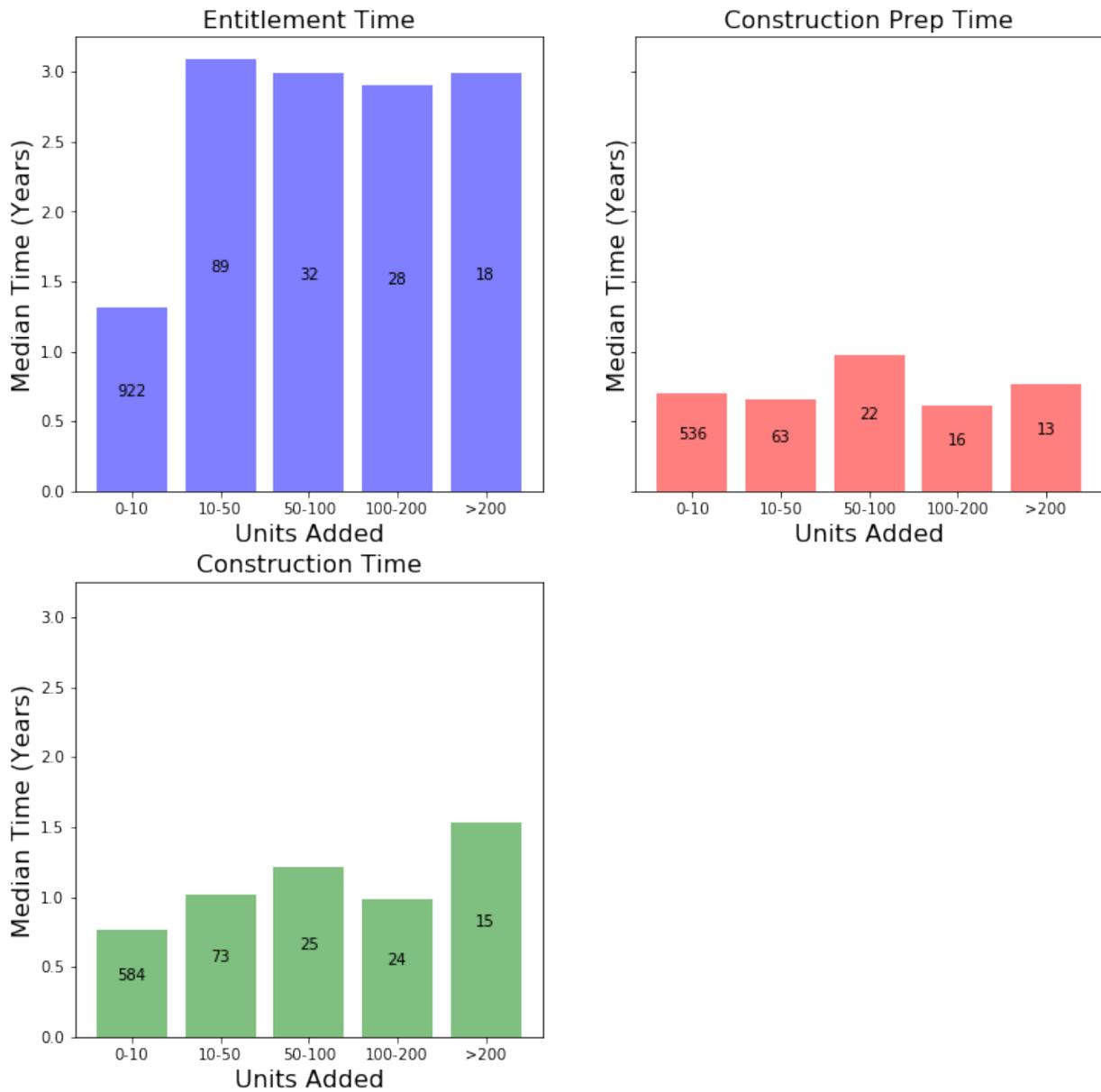


Figure 6. Time to Completion by Size Category (Sample Sizes on Bars)



Finally, I explore differences in development time to completion between neighborhoods. For Figures 7 and 8 below, I use the 41 neighborhoods created by the Planning Department (Analysis Neighborhoods, DataSF). Because some neighborhoods only get small housing developments while others only get very large developments, I normalize development time to completion by dividing by the number of

Brian Goggin

units added. For these graphs, I also drop neighborhoods that have less than 10 developments in the sample in order to mitigate the effects of small sample sizes. The results point to a clear pattern: when we divide time to completion by unit size, lower-density neighborhoods—such as Twin Peaks, Bernal Heights, or the Richmond District—outside of the core of the city have both larger total time to completion and entitlement review times. Conversely, most of the highest-density neighborhoods—places that have also seen the most development, such as Soma, Mission Bay, or Hayes Valley—have the shortest review times. Figures 9 and 10 show these results on the map. These results illustrate that in spite of the much smaller amount of development in outlying neighborhoods, the city spends relatively higher share of time reviewing developments in those areas.

Taken together, Figures 5-10 present evidence to suggest that the city could have a large impact on the timeliness of housing production by streamlining mid-sized developments and easing the permitting review process in outlying areas of the city. Projects with these characteristics have longer review times than their size would dictate are necessary. Not only would targeted streamlining to such projects conserve city resources, but it would also lower the costs of construction for small and mid-sized developments, which are often cheaper to build and therefore cheaper to afford.

Ultimately, we cannot expect large apartment buildings to solve the housing crisis alone. Making the length of the development review process more commensurate with expected review times for mid-sized developments and small developments in outlying neighborhoods is one simple policy that could not only stimulate housing production, but also diversify the overall housing stock.

Figure 7. Time to Completion by Neighborhood

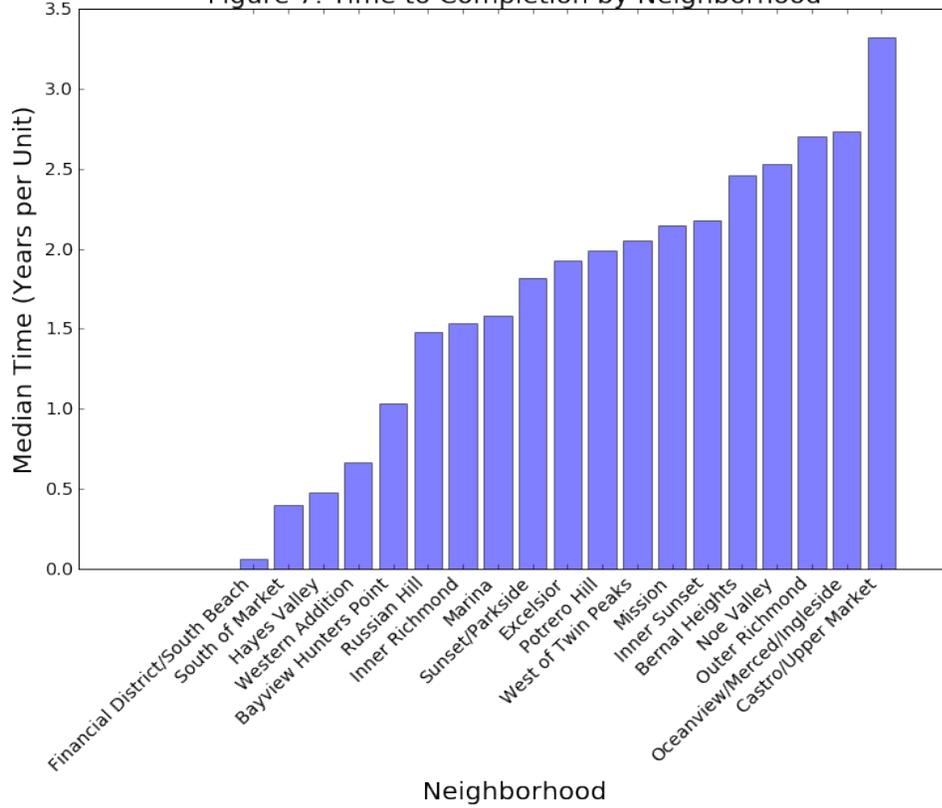


Figure 8. Entitlement Time by Neighborhood

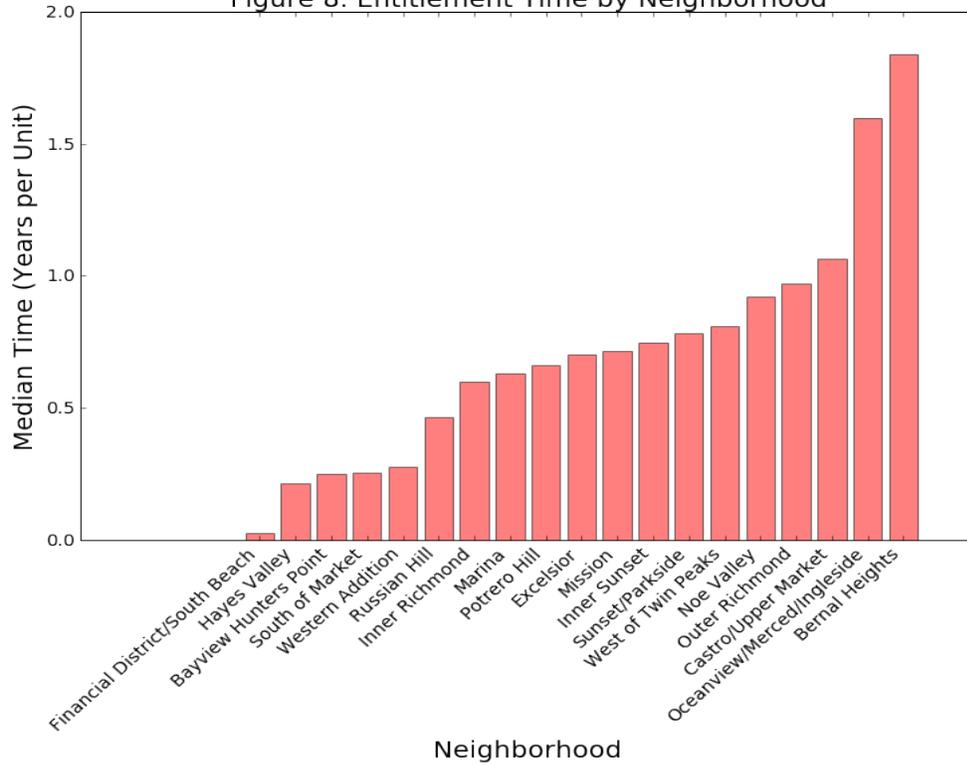


Figure 9. Time to Completion by Neighborhood: Years per Unit

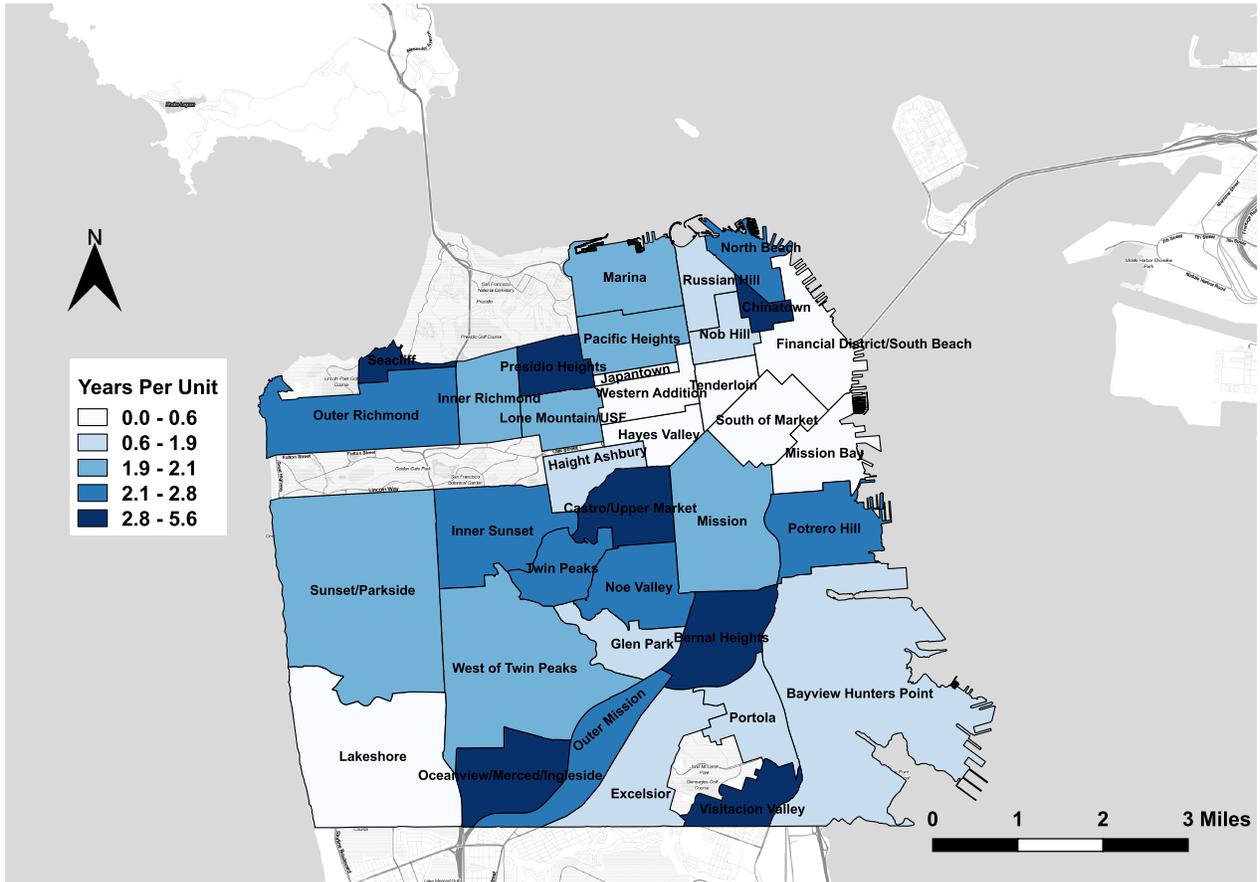
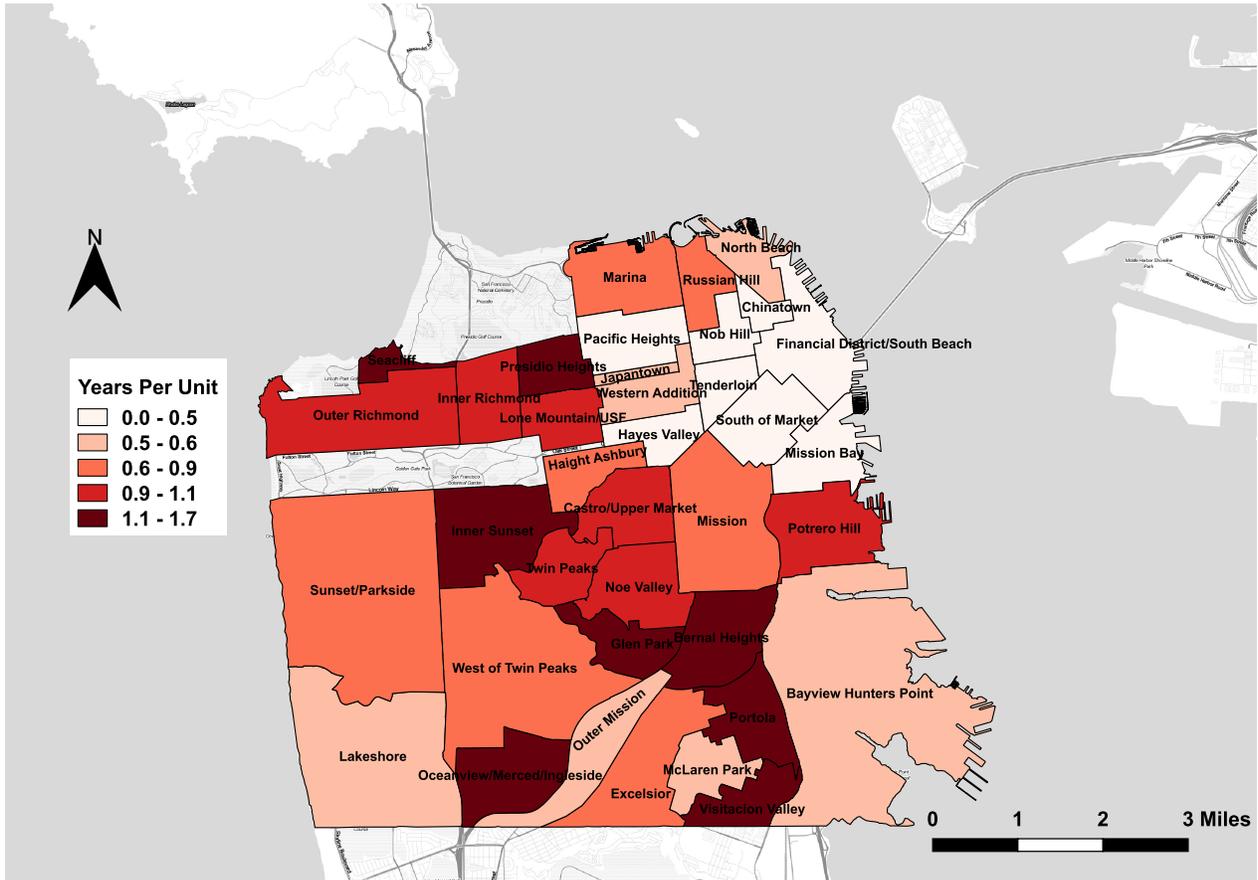


Figure 10. Entitlement Time by Neighborhood: Years per Unit



5. Conclusions/Policy Implications

The above results show a number of notable patterns in housing development review times in San Francisco. First, mid-sized developments (10-50 units) take just as long if not longer than larger apartment buildings, which are often more expensive to build and afford. Second, areas outside of the downtown core of the city have much longer review times relative to the amount of units added than the downtown core itself. Based on these findings, there are a number of key policy implications.

1) Improve Data Quality on the Permitting Review Process

As the above analysis shows, there are a number of key limitations to the data

available for measuring housing development times. First, the Planning Department does not publish data on some key points in the permitting review process, such as the beginning or end of the environmental review process. Because of this, it is impossible to determine which parts of the housing review process take the longest, which is critical for greater public transparency and targeting policy aimed at system improvements. Second, as internal audits have shown, the department also does not even collect key dates necessary for ensuring compliance with state laws that are already in place, such as the CEQA guidelines for environmental review or the state's Permit Streamlining Act. Finally, of what little data the department does gather and publish, manual data entry errors jeopardize its reliability. These data issues could see dramatic improvement with the introduction of a digital application entry system for project applicants. This system would automatically record project attributes from the beginning to the end of the process. As part of this process, I recommend that the Planning Department implement a system of regular data maintenance so that staff members can record changes in a project's status over time.

2) Increase Standards for Requiring Discretionary Review

The analysis above indicates that mid-sized developments (10-50 units) take just as long if not longer than most larger developments. Based on an overview of the permitting review process (see Appendix 1), it is easy to imagine why this might be the case. Many of the system's tools for discretionary review, such as preliminary project assessments or environmental review, begin for projects adding seven or more units. Furthermore, all new housing developments, no

matter how small, are considered eligible for discretionary review in San Francisco, leaving them eligible for lengthy environmental review and public hearings. In the face of a regional housing crisis that is largely brought on by the lack of housing supply, I recommend that the city raise the bar for requiring in-depth permitting review. With a more flexible policy that concentrates review efforts on the largest developments, the city could better allocate resources to the most disruptive projects while at the same time increasing a valuable source of housing supply in mid-sized projects.

3) Expand Permit Streamlining Efforts in Low-Density Areas

The above analysis also indicates that low-density neighborhoods outside of the downtown core have some of the longest permitting review times relative to the amount of units added. While project delays in these areas could be due to greater neighborhood resistance and appeals, the city could be doing a lot more within their own power to speed up the pace of housing development in these areas. For example, they could expand area plans—heretofore mainly concentrated in the eastern and northern parts of the city—to the western and southern neighborhoods. These area plans have pre-approved environmental certifications so that future developments are eligible for streamlined environmental review. Ultimately, expanding streamlining efforts to outlying areas is a more equitable policy as well, as areas in the eastern half of the city, where the Planning Department has already created area plans, are also some of the city's poorest, and so have greater potential of displacement from development. Relaxing tough development constraints in more areas outside of the eastern half

Brian Goggin

of the city could therefore decrease the displacement pressure on poor San Franciscans.

In regards to current state and local policies, these recommendations align more with the state's SB 35 rather than Mayor Ed Lee's executive directive on housing. Although the Mayor's directive has the correct intention in setting firm deadlines for permitting review, it does not reduce any of the onerous permitting requirements, which are likely the cause of long review times. Instead, SB 35 creates the opportunity for ministerial review, in which the city could automatically approve housing that meets certain standards of affordability and the zoning code. The policy recommendations above align with this spirit of reducing requirements in the review process for certain developments, and this requires further legislative rather than executive change.

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Brian Goggin

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Appendix 1. Summary of San Francisco Housing Development Review Process

1. Pre-Application Process

1.1 Preliminary Project Assessment

To start, project sponsors usually first undergo a preliminary review process at the Planning Department known as the “Preliminary Project Assessment” (PPA). In fact, this process is required for projects adding 7 or more units. During this process, the project sponsor submits an initial proposal for the project, which the department then reviews to provide initial feedback based on their initial impressions. The Planning Department issues this feedback in a formal PPA letter, which typically consists of obvious concerns for the sponsors to address before submitting a formal application and an outline of the expected review process (i.e. permits, meetings, and hearings) that a project will have to undergo. This letter is issued within 90 days of receipt of a complete PPA application (“The PPA Process | Planning Department”).

1.2 Pre-Application Meeting

Project sponsors of any new construction are also required to set up a community meeting with neighbors surrounding the project site before submitting official applications to the Planning Department or Department of Building Inspection. The intention is to notify neighbors about the project and to identify issues early on. This provides opportunities to work out concerns privately and to avoid applications for Discretionary Review (see section 3.2 below) filed by citizens later in the process. The Planning Department has a list of relevant neighborhood groups for each area that project sponsors are required to contact. Sponsors are also required to contact all abutting property owners and occupants and property owners and occupants directly across the street. The Planning Department also specifies certain minimum guidelines for the location and times for the meeting. Furthermore, project sponsors are required to document all questions and concerns as well as their responses to those concerns at the meeting ("Pre-Application Meeting | Planning Department").

2. Application Submission and Review

2.1 Environmental Review

As part of compliance with the California Environmental Quality Act (CEQA), sizeable residential projects must undergo environmental review in the Department's Environmental Planning team. This review process can take weeks, months, or years depending on the scale, complexity, and location of the project.

First, the project sponsor submits an environmental application. After receiving this application, the department prepares an initial study evaluation within 30

days to determine whether the project qualifies for a categorical exemption, merits a negative declaration, or requires a full environmental impact report (“Environmental Review Process Summary” | Planning Department 2011).

2.1.1 Categorical Exemption³

The CEQA guidelines detail certain categorical exemptions to the environmental review process. Examples include small projects of less than 7 units or the replacement or reconstruction of existing residences. After determination of the exemption, this decision can be appealed to the Board of Supervisors. After the final approval of the project, there is another 180-day period for which members of the public may file lawsuits under CEQA protesting the decision. Project sponsors may request a Notice of Exemption to shorten this statute of limitations from 180 to 30 days. Overall, projects found to be exempt from CEQA generally finish the environmental review process within two weeks to a few months depending on the required supplemental information.

2.1.2 Negative Declaration

Based on an initial study, the department may determine that your project has no significant environmental impacts and no further study is needed. If the department finds that the project meets these criteria, they then issue a preliminary negative declaration notice to neighbors, who then have 20 days to file an appeal of the decision to the Planning Commission. If no appeal is filed, the decision is finalized after 20 days.

After the final approval of the project, there is another 180-day period for

³ See categorical exemptions here: <http://resources.ca.gov/ceqa/guidelines/art19.html>

which members of the public may file lawsuits under CEQA protesting the decision. Project sponsors may request a Notice of Determination to shorten this statute of limitations from 180 to 30 days. In general, the timeline for any type of negative declaration process is 6 to 12 months depending on the required supplemental information and appeals.

2.1.3 Environmental Impact Reports

In most sizeable projects, the planning staff will have to prepare a full environmental impact report, which details the expected impacts of the development and possible mitigation strategies and alternative development scenarios. As a first step in this process, the department requires that the project sponsor hire a qualified environmental consultant to create a draft environmental impact report (DEIR).

After this DEIR is completed, a public hearing for it must be held at the Planning Commission within 30 days of the publication to receive testimony related to the accuracy and completeness of the DEIR. After this hearing, the department compiles all testimony and addresses concerns in the final environmental impact report (FEIR), which the Planning Commission votes to approve unconditionally, approve conditional on changes, or disapprove in another public hearing.

After the decision rendered at public hearing for the FEIR, anyone who commented on the DEIR may file an appeal to the Board of Supervisors within 20 days after certification. If the Board of Supervisors decides that this appeal is valid, they must schedule a public hearing within 30 days

after the Planning Commission's certification of the FEIR. If the Board of Supervisors votes to reverse the Commission's certification, the Commission must reconsider the FEIR consistent the Board's recommendations. After the final approval of the project, there is another 180-day period for which members of the public may file lawsuits under CEQA protesting the decision. The minimum timeline for the EIR process is 18 months and could be several years depending on the staff workload, EIR comments, and appeals.

2.1.4 Other Studies

In order to assist the Planning Department in their review, project sponsors may also have to conduct additional environmental studies for the project, including shadow studies or transportation impact studies. Oftentimes, these studies are mandatory for any sizeable development. For example, shadow studies are mandatory for any development above 40 feet that casts a shadow on properties under the jurisdiction of the Recreation and Parks Department.

2.2 Entitlement Application

After a project sponsor finalizes the project description as part of either the PPA or environmental review process, he or she must submit an entitlement application with the Current Planning Division to ensure compliance with the city's zoning regulations (i.e. the planning code). The Planning Department requires that this application be filed prior to the completion of the environmental review so that they may better coordinate the two processes.

2.3 Neighborhood Notification

Most new residential construction requires neighborhood notification, a process in which the Planning Department mails a notice alerting neighbors in the vicinity of the project and are given 30 days to respond with concerns or to request a discretionary review (see step 3 below) ("Neighborhood Notification | Planning Department").

3. Additional Discretionary Review

3.1 Conditional Use Authorization

Sometimes projects require conditional use authorization (CUA), in which the Planning Department considers a use that is not strictly allowed within a given zone. In these cases, the applicant must first submit an application to the Planning Department, who assigns a member of the Current Planning Division to review the CUA application and assign a public hearing date at the Planning Commission. The department notifies all owners within 300 feet of the subject property about the CUA application hearing. Furthermore, the planner will gather comments and concerns from the neighborhood during the notification period. At the hearing, the commission determines whether the proposed use is “necessary or desirable to the neighborhood, whether it may potentially have a negative impact on the surrounding neighborhood, and whether the use complies with the San Francisco General Plan.”⁴ If the commission approves the use, they can approve it with certain conditions that mitigate neighborhood concerns.

For each zone, the Planning Code signifies which uses are permitted,

⁴ <http://sf-planning.org/sites/default/files/FileCenter/Documents/481-CU%20Application.pdf>

conditionally permitted with a CUA, or never permitted. However, CUA may also be required in other instances, such as residential demolition, Planned Unit Developments, and exemptions from off-street parking. In certain zoning districts, a CUA is required for developments that exceed a certain size even if they meet other zoning constraints ("Conditional Use Authorization | Planning Department").

3.2 Requested Discretionary Review

The Planning Commission reserves the right to individually review all projects—even those that comply with the Planning Code—and request changes. In most circumstances, this take place in the form of a standard hearing when the project is requesting environmental or CUA approvals. However, the Commission can request to review a project outside that does not require these other forms of discretionary review. Despite this, the power of discretionary review is a special power and the City Attorney has advised the commission to use the utmost constraint in regards to this review power.

Typically, the Planning Commission must receive an application from a member of the public requesting that they use their discretionary review power. After receiving notification from the department of the upcoming development (see Section 2.3), neighbors have 30 days to request discretionary review. If such a request is made, the Zoning Administrator sets a time for the Planning Commission to consider whether or not to approve the application and exercise discretionary review ("Discretionary Review | Planning Department").

3.3 Variance Applications to the Zoning Administrator

If a project site suffers from unusual physical obstacles, the project applicants

can submit requests for exemptions from the quantitative standards of the Planning Code. Examples include rear yard setbacks, open space requirements, or dwelling unit exposure requirements. The Zoning Administrator (ZA) holds public hearings for all variance requests, and the Planning Department mails notifications of these hearings to all property owners within 300 feet of the subject property in order to hear public concerns. At the conclusion of the hearing, the zoning administrator issues a variance decision letter, which may take up to 2 months to complete after the hearing. Furthermore, the decision can be appealed to the city's Board of Appeals ("Zoning Administrator | Planning Department").

3.4 Historic Preservation Commission

Article 10 of the Planning Code designates properties as historic throughout the city. Projects that propose alterations to such properties must receive a Certificate of Appropriateness from the Planning Department. Depending on the project's scope, this can require just internal review of the Planning Department Preservation staff or a public hearing before the Historic Preservation Commission. As most other kinds of discretionary review, the Planning Department sends public notifications to project neighbors within 150 feet of the project in order to receive public comment. At the public hearing, the preservation commission votes to approve, approve with modifications, or disapprove the Certificate of Appropriateness. Depending on the Preservation Commission's workload, this process can take up to few months ("Certificate of Appropriateness | Planning Department").

3.5 Planning Commission

The Planning Commission is a 7-member body appointed by the Mayor and Board of Supervisors that hold public hearings to deny, approve, or request changes for projects requiring some form of discretionary review in steps 2 or 3 above (most projects). In most circumstances, the commission will hear both the environmental applications (see 2.1 above) and other applications for discretionary approval (see 3.1 to 3.4) for a single project at the same time. Depending on the workload of the Planning Commission, projects that have been previously scheduled can be “continued”, or pushed onto the agenda for a future meeting. Continuances can also happen when a development is extremely political and commissioners feel like they need more time to deliberate internally or require more materials from the project sponsor before they are ready to make a decision at a public hearing ("Hearing Procedures | Planning Department").

4. Post-Entitlement Review (Review by Other Agencies)

4.1 Possible Appeals

Depending on the kind of approval needed, individuals may file an appeal of Planning Commission decisions within a few weeks of the approval. People can file appeals for CEQA determination, conditional use authorizations, variances, historical preservation determinations, and other types of discretionary review. These appeals are heard either by the city’s Board of Appeals or the Board of Supervisors ("Hearing Procedures | Planning Department").

4.2 DBI Building Permits

Aside from receiving approval from the Planning Department, applicants must

ensure that their plans abide by the city’s building codes by applying for a permit with the Department of Building Inspection (DBI). DBI usually verifies compliance with the building code after the Planning Department completes their review. DBI inspects projects at several points before, during, and after the construction process, issuing a final “certificate of completion” at the end of its review process.

4.3 Other Agencies

A variety of other agencies review housing development applications, including, but not limited to the Fire Department, the Health Department, and the State Alcoholic Beverage Commission (for mixed-use projects). These review processes are mostly administrative in nature and so do not require public hearings separate from the Planning Department’s review process.

Appendix 2. Summary of Methodology

I outline the steps of accumulating, cleaning, and analyzing development data to estimate the length of the development process below. This data—known as the quarterly “Development Pipeline Reports”—comes from the San Francisco Planning Department. First, I outline the steps in the data accumulation and cleaning process. Then, I list the assumptions made in this process. All of the data as well as the code can also be found on Github.⁵

1. Steps

1.1 Append the datasets together. First, I append all of the quarterly development pipeline reports from Q3 2009 to Q2 2017 together. Unfortunately,

⁵ Github repository here: <https://github.com/brgoggin/datasci-housing-pipeline>

the formatting and naming is not standard across the development pipeline reports. Therefore, I create keys for every report that translate the names of variables (e.g. project attributes) into a common naming convention.

1.2 Clean appended data. After I have one dataset of all of the appended data together, I clean the data to standardize the variable formatting. Based on the available project dates, I also generate the project start date—called “firstfiled” during this stage (see assumptions below). In this master file, unique observations are at the project-quarter level.

1.3 Create One Record Per Project. Next, I transform the cleaned master dataset from step 2 into a dataset with one record per project. In order to do so, I first sort the each project’s observation in the dataset by date in order to identify the key project dates below. I then create a dataset with a single observation for each project with the key project dates and other project attributes.

1.4 Final Cleaning. Before analyzing the final dataset created in step 3, I conduct some final cleaning steps. These include: filtering out projects that have less than 1 unit (i.e. non-residential projects), dropping those for which I could not identify the date at which they first filed an entitlement application, dropping projects that have a matching building permit ID with another project (see why below), dropping any observations with the same first filed date as another observation (see why in the assumptions below), and adjusting unit counts for special cases (see why in the assumptions below). Before starting this final cleaning process, I have a sample of 3,081 residential projects. After dropping those without a first filed date, I have 2,793. After dropping those with duplicate

building permit records, I have 2,474, which is our final sample for analysis.

1.5 Analyze Data and Create Graphs Used in the Paper.

2. Assumptions

2.1 Unique Observations. I identify unique observations to be those projects with the same address and apn number (i.e. parcel number). It is possible that there could be multiple projects with the same address and apn number. However, this should be exceedingly rare given the short time frame of the analysis (about 8 years). Furthermore, after the data cleaning steps above, I check if there are any duplicate address-apn-first date filed projects, and this is not the case. Sometimes, these unique observations can share the same building permit ID number as another. The reasons for this vary, including a different spelling of the address that is difficult to correct or mega projects that include multiple sub-developments. In these cases, I drop the observations from the analysis.

2.2 Key Project Dates

- a. First Filed.** This is the date of the first official application submitted to either the Planning Department or the Department of Building Inspection. I drop observations that do not have either of these dates (i.e. I cannot identify the “first filed” date). By dropping these, I lose 288 observations (final sample is 2,474).
- b. Receipt of Building Permits** This date of the receipt of building permits signifies the end of the development review process and the beginning of the construction prep and construction phases. Throughout the

development pipeline reports, there is a column called “best_stat” that states the date of the latest project status. I chose the date of the receipt of building permits from this date field. In order to do so, I identify the latest date of any one of the following statuses: building permit approved, building permit issued, or building permit reinstated. I drop observations that do not have this date available. By dropping these, I lose 319 observations (final sample is 2,747).

- c. **Project End Date.** Finally, I have to make an assumption to identify each project’s end date. When a project reaches completion (technically, when it is issued a certificate of final completion from the Department of Building Inspection), it drops out of the quarterly development pipeline reports. Because of this, I know that if a project has been under construction in the reports and then drops out, it is likely that it has reached completion. Therefore, I identify the date of completion as the first day of the quarter when a project that has been listed as under construction in previous reports fails to appear in the pipeline reports. Because a quarter spans three months, this date could be underestimating the actual date of completion by as many as 3 months of the actual date of completion.

2.2 Unit Count. Projects in the data sometimes have changing unit counts over time. For every project like this, I assume that the most accurate unit count is the latest one available that appears in the data. Although it is possible that changing unit counts over time represent a data entry mistake from staff at the Planning Department, it is also possible that changing unit counts represent legitimate

changes to the project as it goes through the development review process. Finally, sometimes the net units added (i.e. total units added minus total units demolished) is less than the units added of the project. Based on a number of cases, I have discovered that it is likely that planning staff understand units added to mean the total number of units at the project's site rather than the number of units added by the project itself. Therefore, in cases where the units added amount is greater than the amount of net units added, I adjust the project units added to equal the net units added amount.

Appendix 3. Affordable v. Market-Rate, Within Area Plans v. Outside Area Plans

Many permit streamlining efforts, such as SB 35, have been aimed at increasing permitting times for affordable housing developments that have income restrictions. Furthermore, local efforts in the past have focused on area plans, which streamline permitting by having pre-approved, area-wide environmental certification so that future developments are cleared for environmental review. The findings below indicate that both affordable housing developments and developments located within area plans have longer overall permitting review times but shorter review times per unit added. These findings support the paper's policy conclusions that streamlining efforts in the eastern half of the city—where many area plans and affordable housing developments are located—have been largely successful at speeding up housing production and should therefore be expanded to low-density, outlying areas as well.

3.1 Process of Merging in Affordable Housing Data

Brian Goggin

The development pipeline dataset does sometimes have information on whether a development has affordable units or not. However, this information is missing from Q2 2009—Q1 2014, which is most of my sample of Q2 2009—Q2 2017. In order to identify more affordable housing projects in my sample, I merged in projects from the Low-Income Housing Tax Credit (LIHTC) database from the California Tax Credit Allocation Committee and the list of inclusionary development projects available on DataSF.⁶ In both instances, I merge with the development pipeline projects based on project address. In doing this match, I conduct a fuzzy match, meaning that they match either if one address string is a perfect subset of the other (e.g. “1600 MISSION ST and 1600 MISSION STREET) or if there is a perfect match. There are only 15 LIHTC project matches with the development pipeline data, and I visually inspected each one to make sure that the place in service date is after the first application to the Planning Department. To the best of my ability given the available data, this ensures that these projects are in fact matches. For the inclusionary projects, I keep every match whose planning approval date in the inclusionary zoning data was within 20 years of the date of first submission to the entitlement process in the development pipeline data.

3.2 Results

Table 1 below shows the average approvals times for 100% affordable projects, mixed-income projects, projects with any affordable units (100% affordable and mixed-income combined), and 100% market rate projects. All categories of affordable projects have a drastically higher mean entitlement times than market rate projects and slightly lower average construction prep and construction times. The total time to completion is larger

⁶ Sources: <http://www.treasurer.ca.gov/ctcac/projects.asp>, <https://data.sfgov.org/Housing-and-Buildings/Residential-Projects-With-Inclusionary-Requirement/nj3x-rw36>

for affordable projects, but this difference appears to be driven entirely by longer entitlement times.

Table 2 shows the average approval times per unit. In contrast to the total project times in Table 1, all types of affordable projects appear to have drastically lower times. This could be because while affordable projects take longer, they add more units than the average market rate project.

Sample sizes are extremely small, but stars indicate where average times are statistically different from the average times for 100% market rate projects.

Table 1. Average Project Times: Affordable versus Market Rate

	100% Affordable	Mixed	Any Affordable	Market Rate
Entitlement Times	2.47	4.39***	3.98***	1.97
(N)	(17)	(62)	(79)	(1010)
Construction Prep Times	1.04	0.94	0.96	1.13
(N)	(15)	(46)	(61)	(589)
Construction Times	1.04	1.4	1.3	1.22
(N)	(17)	(50)	(67)	(654)
Total Times	4.49	6.67***	6.12***	4.25
(N)	(17)	(50)	(67)	(654)

Notes: Conducted two-sided t-tests between averages times of each category and "Market Rate" category. Statistical significance represented by: *** (<0.01), ** (<0.05), * (<0.1).

Table 2. Average Project Times Per Unit: Affordable versus Market Rate

	100% Affordable	Mixed	Any Affordable	Market Rate
Entitlement Times	0.25***	0.1***	0.13***	1.26
(N)	(17)	(62)	(79)	(1010)
Construction Prep Times	0.15**	0.02***	0.05***	0.82
(N)	(15)	(46)	(61)	(589)
Construction Times	0.06***	0.03***	0.04***	0.89
(N)	(17)	(50)	(67)	(654)
Total Times	0.29***	0.16***	0.19***	2.81
(N)	(17)	(50)	(67)	(654)

Notes: Conducted two-sided t-tests between averages times of each category and "Market Rate" category. Statistical significance represented by: *** (<0.01), ** (<0.05), * (<0.1).

2. Differences Between Area Plans and Non Area Plans

San Francisco has 42 area plans, which are area-specific master plans that guide the future growth and development of that area. In most cases, these area plans include permit-streamlining measures, such as pre-approved area-wide environmental impact reports (EIRs). As long as proposed projects stay within the approved limits of these cumulative EIRs, they are eligible for environmental streamlining. In the tables below, I compare average project times between developments in area plans with those outside area plans. As above, I compare both total approval times with approval times per unit.

Table 3. Average Project Times: Area Plans versus Not

	Within Area Plan	Outside Area Plan
Entitlement Times	2.75***	1.77
(N)	(383)	(706)
Construction Prep Times	1.09	1.13
(N)	(235)	(415)
Construction Times	1.32	1.18
(N)	(262)	(459)
Total Times	5.22***	3.97
(N)	(262)	(459)

Notes: Conducted two-sided t-tests between averages times of each category and "Market Rate" category. Statistical significance represented by: *** (<0.01), ** (<0.05), * (<0.1).

Table 4. Average Project Times per Unit: Area Plans versus Not

	Within Area Plan	Outside Area Plan
Entitlement Times	0.87***	1.35
(N)	(383)	(706)
Construction Prep Times	0.49***	0.89
(N)	(235)	(415)
Construction Times	0.61***	0.92
(N)	(262)	(459)
Total Times	1.8***	3
(N)	(262)	(459)

Notes: Conducted two-sided t-tests between averages times of each category and "Market Rate" category. Statistical significance represented by: *** (<0.01), ** (<0.05), * (<0.1).