

Developing housing for a changing demography

Analyzing the implications of the regulations governing the development of small-housing units

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By

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Keywords

Changing Demographics | Small-Housing | Development Regulations

Abstract

The micro-units, efficiency units, and group-housing, collectively referred to as small-housing units in this thesis, and the Single Room Occupancy (SRO) units have been, and are continually developed to cater to the demand for affordable housing in urban core regions suited to house the increasing number of single-adults, students, the homeless population, etc. As the proportion of single-adults rises exponentially in cities in the US, it is only logical to assume a commensurate rapid development of these small-housing units. However, the supply of these small-housing units is much less as compared to its supposed demand from a growing population of single-adults. Hence, there is an observed mismatch between the actual demographic trend (that can be measured), and the ‘apparent’ demand for small-housing units in the urban core regions. Some blame the intensity of the underlying regulations, others blame the NIMBYistic attitudes of neighbors, yet, certain predict that the development of the efficiency-unit type is simply a hype and may soon die down (Infranca, 2014), (Urban Land Institute, 2014), (Beyer, 2016).

The thesis identifies issues that impede the commensurate development of the small-housing unit type, which has been cited as holding a solution to provide reasonably priced housing opportunities for single adults in high-value markets (Rack, 2016), (Potikyan, 2017). The research identifies those issues in two sequential parts. First, the unpleasant experiences with the SROs in the mid-twentieth century that continue to stunt the development of similarly sized

small-housing units in the US. Second, to avoid the recurrence of such a condition, the regulations build in redundancies that further restrict the development of cost-effective housing that small-housing units aim to provide. These issues are then analyzed in further detail to derive key factors that impede the development of small-housing units, and to understand if the unit type holds a sustainable solution to cater to the housing demand of a changing demography. These concerns are addressed through a series of case-studies, demographic analyses, and interviews with city agency officials and subject experts, in select cities such as Atlanta, Boston, Los Angeles, New York, and San Francisco.

By systematically answering the questions in the outline below, the thesis answers the larger research question about the implications of regulations and policies that are adopted to govern the development of small-housing unit apartments in selected major cities in the US.

Outline

Part I – The provision of small-housing

- What are small-housing unit apartments?
- For whom are they being developed?
- Where are they being developed?
- Prevalent issues regarding small-housing unit apartments.
- The view of city agencies and how they deal with the development of small-housing units?
- How are they developed? Strategies and Policies being implemented to foster the growth of small-housing unit apartments
- Issues with small-housing units: Regulatory, Neighborhood, Occupants, Financial Institutions
- Issues faced by existing and potential tenants (Urban Land Institute, 2014).
- How do city agencies try to address those issues while developing for the changing demography?

Part II – The regulatory framework

- What regulations existed prior to development of small-housing unit?
 - What and how barriers were removed for the development of the units?
 - Why and what policies are being implemented to control the growth of such units?
 - What kind of micro-unit apartments are being developed in cities?
 - Why certain cities are seeing more development of this unit typology than the others?
 - What are the implications of strategies and policies that are adopted to control the development of small-housing units in selected major cities in the US
-
- **Analyzing the implications regulations and policies that are adopted to govern the development of small-housing unit apartments.**

Part III – Potential for growth

- Analyzing the policies and their implication on regulations that are devised by city agencies for the well-being of the society at large.
- Are small-housing units an appropriate housing type with a long-term solution for affordable housing problems in cities with a growing population of single adults?
- What is the social construct around these apartments?
- Could living in small-housing be considered acceptable?
- Policy recommendations.

Introduction

There is an observed change in the demographic composition of the society, and the way people are choosing to live around the world (World Economic Forum, 2015). The trends are leaning toward a population that is seeing a steady rise in the median age, with an increasing desire to live alone (Magnus, 2009), (Perine & Watson, 2011). Young urban professionals are supplemented by a growing proportion of mature aged persons, to comprise an ever-increasing pool of single-person households, especially in countries of the global north (Chamie, 2017), (EuroMonitor Int'l, 2017). The US also follows this trend. As can be seen in Table 1, selected cities in this thesis contain a higher concentration of this demographic composition of single-adults as compared to the areas outside these urban centers. And both subsections of single-adults, the young professionals and the mature-aged individuals, are in the need for affordable solutions to their housing demand. While the younger subsection is at the beginning of their career paths and have limited income, the mature subsection could have a variety of reasons including higher medical expenses, or inadequate income from the pension amount, or other situations that eventually restricts them from spending a high proportion of their income on housing costs. On the other hand, the housing stock available in some of the high-value real-estate markets (cities) in the US, is not sufficient to fulfill the demand of the majority population, and is hence, expensive. As a result, there is an obvious disbalance between the housing needs and its availability suited for the demographic composition. As the proportion of recent college graduates, young professionals, beginning families, and empty-nesters increases steadily in major cities across US, and the rate of development of cost-effective housing apparently diminishing (Stern & Yager, 2018), the disparity in housing demand and its supply widens over time.

City (State)	Single-Person Households (City)	Single-Person Households (State)
Atlanta (GA)	46%	26.88%
Boston (MA)	38% %	28.64%
Los Angeles (CA)	30% %	23.97%
New York (NY)	33%	29.78%
San Francisco (CA)	39%	23.97%

Table 1: Percentage of Single Person Households in Selected Cities and corresponding States
Source: (State)B11016 – Household Type by Household Size: American Community Survey (2016); (City) Single person households in United States (Statistica Atlas)

Individuals in each of the subsections prefer privacy, but do not wish to be isolated from the neighborhood. They also prefer to live frugally but would want to have a basic standard of living with an access to conveniences. As a result, they prefer to be in the proximity of a robust transit network or in the walkable distance from those amenities, recreational and entertainment facilities (Urban Land Institute, 2014). These facilities converge in urban core regions, and the level of services at disposal eventually drives the cost of living in this core. As can be observed from Appendix 1.1. the proportion of single-adults living already in core city regions is higher (Statistical Atlas, 2016). The individuals already occupying the micro-units and the potential renters, when surveyed by Urban Land Institute (2014), expressed that with limited funding availability, there was a higher likeliness of giving-up excess space in an apartment in exchange for being cost-efficient and being located in the core regions in the proximity of the amenities. There are a variety of apartment configurations accommodating a lifestyle that trades ‘excess’ space for a better location. These apartments range from micro-units or smaller studios, to shared suites with a shared kitchen and/ or sometimes even a shared bathing facility. These are marketed as ‘efficiency’ units, packing all the basic amenities in an area that is 20 to 30 percent lesser than a conventional apartment in a similar configuration.

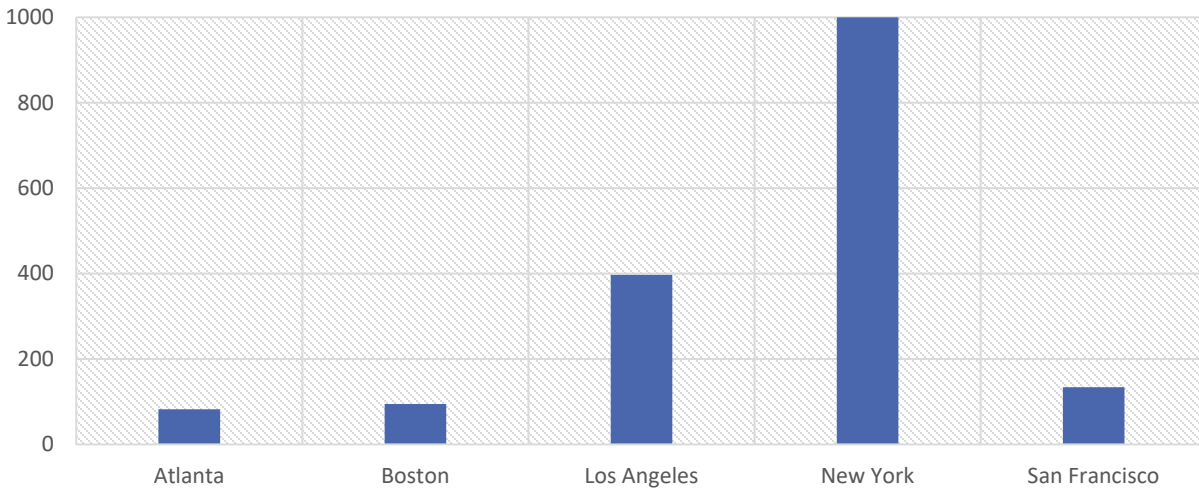


Chart 1: Number (in thousands) of Single-person households in selected cities

Source: *Single person households in United States (Statistica Atlas), 2016* <<https://statisticalatlas.com/United-States/Household-Types>>

One may be forced to think, that if the demand, and the ideal solution, both exist, why are more of the small-housing units not being built to simply fulfill the housing demand of single adults in these cities. While the concept of producing apartments commensurate for the growing market of individuals sounds like a logical solution, there are several ambiguities in its realization. City agencies, neighborhood organizations, occupants, and financial institutions raise concerns about the small-housing unit type itself, causing a major challenge for its proliferation. While certain city agencies are experimenting with their existing regulations to foster the development of small-housing units and SROs, other cities are being cautious of modifying their regulations bearing the weight of past events, and certain others are introducing more regulations after initially attempting to develop the unit typology. A conflicting scenario for the acceptance of the unit typology between cities, draws light on questioning the relevance of the unit typology toward fulfilling the housing demand for the growing demography of single-person households. Hence, it is important to critically analyze the implications of strategies and policies that are adopted to control the development of micro-unit apartments and understand the regulatory framework that either fosters or at times impedes the development of small-housing units.

Definitions

SRO: A single-room occupancy unit is an apartment building with a series of smaller rooming units fitted with a bed and a dedicated bathroom. (Stern & Yager, 2018). SRO tenants live in these single rooms and share the facilities like a kitchen and a dining space. The rooms are usually planned to flank both sides of a narrow corridor for reasons of efficiency. The SROs have provided for most of the small-housing needs in the nineteenth to the twentieth century, but were phased out since they faced a problem of overcrowding leading to unhealthy living conditions. As these comprised of a substantial housing stock in the city, discontinuing the use of all such units has been impractical. Hence, cities have allowed for them to exist in one way or another. Similar in their configuration, the SRO unit type can be found in hotels, rooming houses, apartment buildings, lodging houses, student housing, etc. (Sullivan & Burke, 2013).



An SRO at the Milshire Hotel at 2525 N. Milwaukee Ave.

Source: Chicago Tribune < <http://www.chicagotribune.com/business/ct-chicagao-sro-proposal-1110-biz-20141107-story.html> >

Small-housing: This thesis discusses regulations that allow for the following three unit-types in detail, and unless otherwise specified, the term ‘small-housing’ shall be used to address the overall typology comprising a) micro-units, b) efficiency-dwelling units or micro-suites, and c) group-housing. As all three unit-types are primarily living spaces with an optimized square footage, and contain some elements of shared spaces, there is little distinction between the lifestyle they offer. Hence, it may be best to discuss them as a single typology called ‘small-housing’. After the discontinuation of the SROs, these small-housing units are fresh attempt by developers and housing advocates to optimize housing production for a changing demography.

a) Micro-units: These are 20 to 30 percent smaller than a studio apartment and typically include a bathroom and a kitchen in the unit. Spaces are designed with flexible and collapsible furniture to optimize the available space for different settings during the day. Developers try to attract the tenants by providing additional amenities in house, and by locating the development in prime locations in the proximity of other infrastructure. It is mainly rented out as market-rate units in most cities, but the sheer reduced size allows for it to be occupied by single adults or couples with limited belongings (Urban Land Institute, 2014).

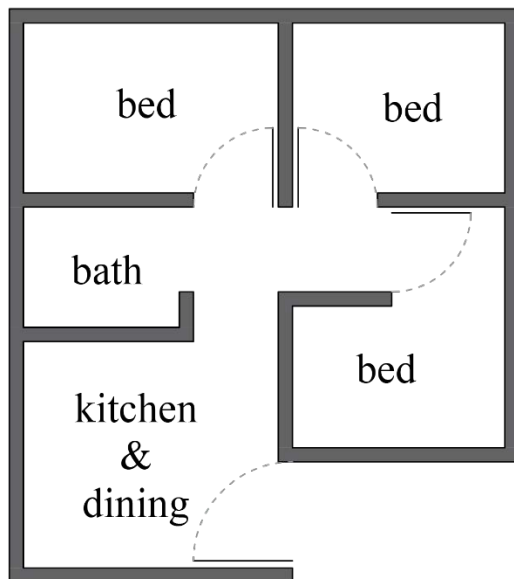


Plan of a typical
Micro-unit apartment



Micro-unit apartment mock-up at the Making Room Exhibition by CHPC
Source: Business Insider

b) Efficiency-dwelling units / micro-suites: These units are simply efficient solutions to the conventional one to four-bedroom apartments. As an extension of the micro-unit name, these are sometimes also referred to as micro-suites. In this unit type, each of the bedroom could have a bathroom accessible from within the room or could have a shared bathroom facility between all the occupants in the suite. Certain such modifications allow for a reduced size of the apartment unit, and hence could be rented for an optimized rent (Stern & Yager, 2018).

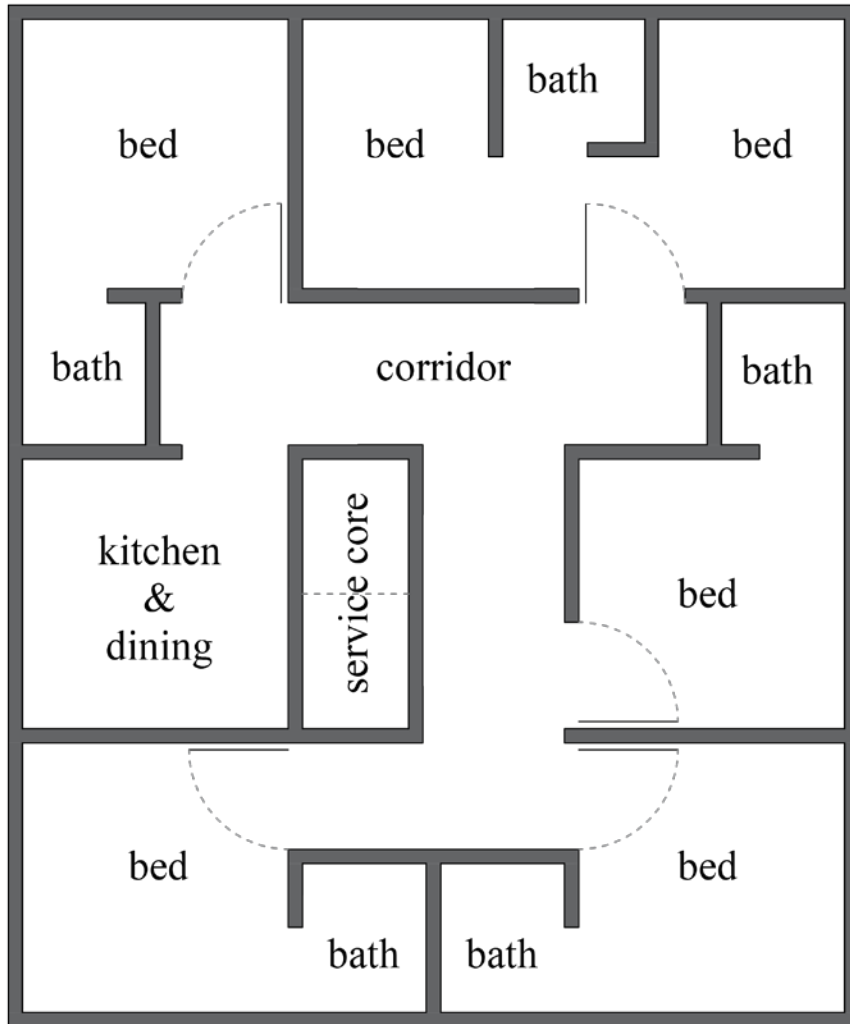


Plan of a typical Efficiency Unit with a shared kitchen



Render for a multi-bed efficiency-unit with shared kitchen
Source: (Urban Land Institute, 2014)

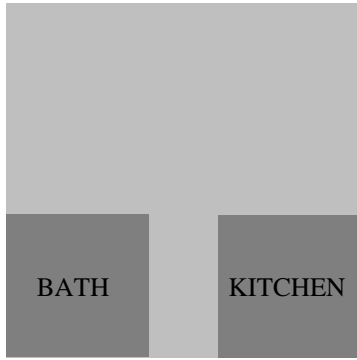
c) Group-housing: Are housing facilities designed based on the model of shared facilities. The units themselves could have only basic facilities including a bathroom and a kitchenette with limited cooking facilities. The spaces within the unit are optimum for sleeping, and storage of limited belongings. However, common spaces that are shared by a few units, would be designed to accommodate all that is missing in the units due to space constraints (Urban Land Institute, 2014).



Plan of a typical Group-housing with a shared kitchen and dining facility.



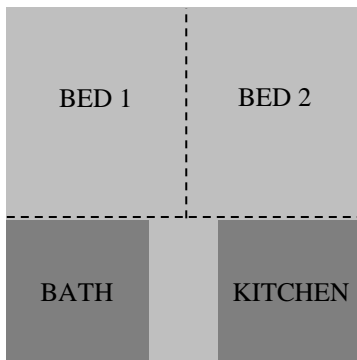
Starcity Homes in SF – Shared living spaces
Source: starcity.com



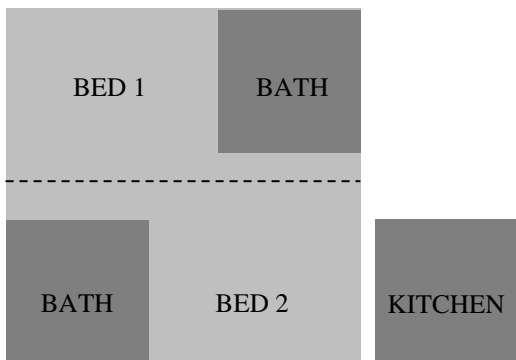
Conventional Studio Unit



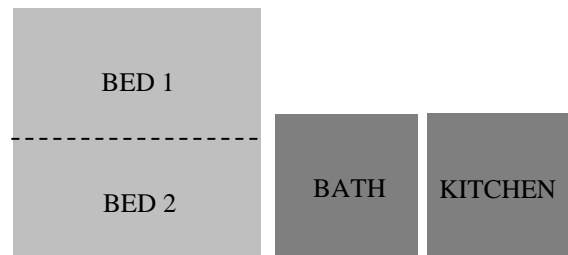
Micro-unit
25% less sq.ft.



Efficiency Unit with a shared Kitchen and Bath



Group Housing with shared Kitchen



Group Housing with shared Kitchen and a shared Bath

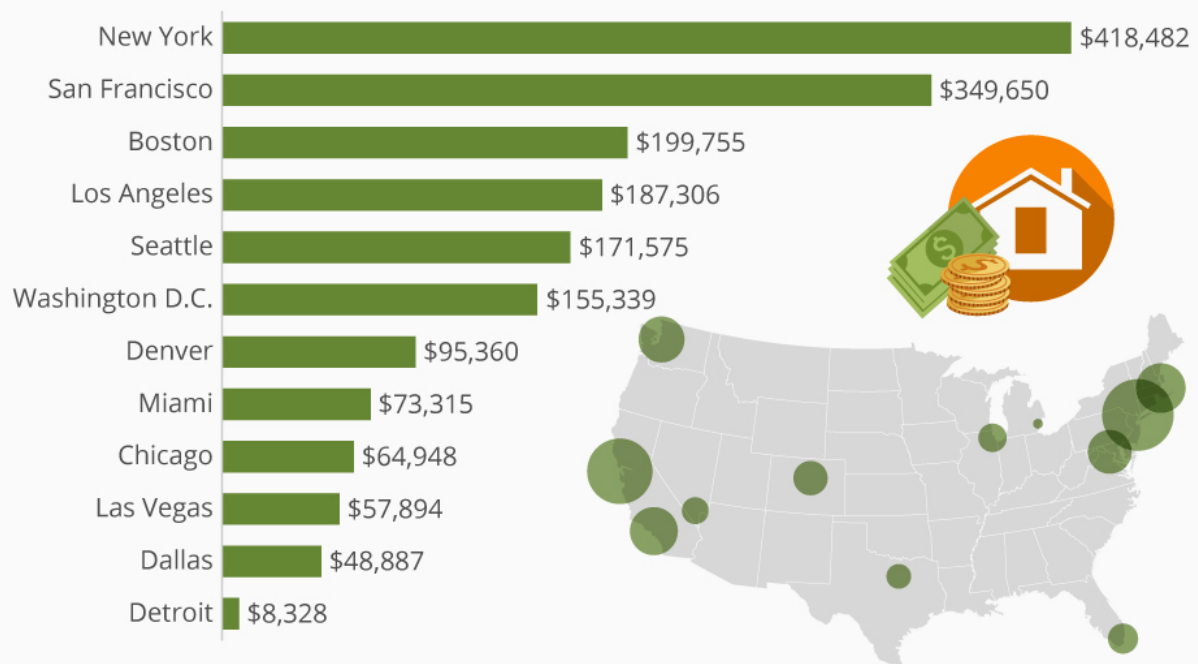
Methodology

The research compares how the regulations control the development of small-housing units and SROs in select cities across the US. The research follows the outline (see pg. 2-3) in investigating each of the subparts.

Part I – ‘the provision of small-housing’ discusses the context in which small-housing unit apartments are placed. Review of secondary literature defines the small-housing type and where they are located. Coming from initial research, several cities were shortlisted for further analysis based on their level of involvement in fostering the growth of small-housing. The scope of the study was to compare each of the cities in a varied stage of adapting regulations. With retained SROs, and allowances for group-housing, San Francisco emerged as a relatively ‘progressive’ city allowing for development of small-housing units and new SROs. Los Angeles too, has seen the local government experimenting with regulations to allow for such units in more than one neighborhood (Sharp, 2017). In the past couple of years, New York too, has been seeing a development in all three sub-groups with a building dedicated entirely to micro-units (nArchitects, 2016). Boston through its development of the Housing Innovation Lab (HIL) in 2015, is experimenting with certain development regulations, but has not managed to build any units in particular that could be categorized in either of the sub-groups within the small-housing typology (Acitell, 2016), and hence it could be considered to be slow paced as compared to other cities, but it would be interesting to understand the reason behind that slow growth. Finally, a city with no small units, or plans for it whatsoever, is compared to help locate an approximate tipping point at which the cities plan to scale down their apartment size. Atlanta, has seen a steady growth of single adults, but the landscape is still under sprawl (Burns, 2014). Hence, it serves as a good measure for comparing the regulations under consideration.

Where Home Buyers Need Deep Pockets

Salary required to buy a home in U.S. cities in 2018*



* With a 10% down payment (selected cities)

@StatistaCharts Source: Unison Home Affordability Report 2018

statista

High-Value markets in the US. The top-five cities are serve as case-studies.

Source: Statista.com (McCarthy, *Where Home Buyers Need Deep Pockets*, 2018)

Data was derived for the number of conventional small apartments in the studio and one-bedroom category in those cities. This initial research was followed-up with an analysis of the demographic profile in the selected US cities using American Community Survey (Five-Year estimates) for 2016, and American Housing Survey datasets for 2011 and 2016. This step informs the composition (proportion of single-person households, proportion of rent-burdened households – see glossary for definition) of the population in those cities. The first two steps helped understand the functioning of each unit-types, the magnitude of demographic change, the disparity between the demand and the supply of housing and help identify the gaps in the market

(Table 3). The demographic study includes an analysis of the trends for the following characteristics in selected cities between 2011 and 2016:

- a) Household size and proportion of single-person households.
- b) Proportion of conventional studio and one-bedroom units in the market.
- c) The proportion of income being paid as rent and proportion of rent-burdened households.

Through a review of secondary literature posted on the city's relevant website, and through a series of interviews with key personnel in the city agencies and subject experts, a database of regulations in place for controlling the development of small-housing units in those cities was prepared. By comparison of the regulations in the past and those proposed, the development potential of the small-housing units was understood for each of the selected cities. The next step was to investigate the strategies and policies that are being implemented in the said cities to foster the development of small-housing unit and SROs. A standard survey with the following questions guided the telephonic interview:

- Does the city promote the development of such small-housing units? Where, for whom, and in what quantity have they been developed?
- What are the different policies being adopted to foster the development of small-housing unit apartments?
- What are some of the issues that the city agencies face when allowing for such units?
- What were the regulatory barriers that have been negotiated to allow for such a development?
- What issues are city planning or other related agencies facing when developing unit type?
- What issues arise from the neighborhood organization where these units are being developed?
- What are the neighborhood characteristics where micro-unit apartments are proposed?
- What is the impact of the strategies being implemented to foster the growth of these units?

Similarly, discussions with subject experts revealed information on the relevance of the small-housing typology and its potential to fulfill the housing demand in the future.

Part II – ‘the regulatory framework’ delves deeper into the actual regulations in those cities. While the literature review of secondary data revealed what regulations existed prior to the ones newly introduced, a continued discussion with the agency personnel and experts based on the following questions informed the relevance of those regulations and the reasons for their modifications.

- What existing regulations were modified to give rise/ curtail additional growth of small-housing units?
- What apartment types are being developed under these modified regulations?
- Are these an acceptable type for the demographic trend as envisioned by the city and state agencies?
- What are the major control points to regulate the development of small-housing units?
- What is the implication of these policies and is the city able to achieve its goal?
- Are there other policies in place to provide for the demographics without depending on small-housing typology?

Understanding the approach of the agencies toward the small-housing units helped inform the key factors that control the development. It was also important to understand the externalities of such a development, the analysis of which leads into part III – ‘potential for growth’, of the research, in which insights from the above discussions inform if small-housing apartments are an appropriate housing type for the current demographic trend, or can other methods be applied to cater to the immediate context. The interviews also revealed the strategies being adopted by city agencies, allowing for an understanding of the general consensus toward small-housing.

Additional literature was reviewed to form an opinion on the social constructs around small-housing. Together, these helped in formulating a deeper understanding of the small-housing markets, and the level of involvement that local governments possess for modifying regulations to foster the development of small-housing.

Literature Review

Small-housing, or the lack of it, has been discussed since the dwindling of the housing stock due to its discontinuation. However, discussions on small-housing (especially in New York City) picked traction after Citizen Housing Planning Council's, Making Room study (Perine & Watson, 2011). The study discussed the growing number of single adults in New York City and highlighted the lack of housing options to suit their needs. Owing to the situation of overcrowding caused by rather liberal laws on the SROs, the city agencies in New York City introduced strict laws such as the Multiple Dwelling Law in 1929 and the Housing Maintenance Code thereafter, to limit the maximum number of un-related adults living in an apartment to two. By the mid-1950s, under the Local Law 24, new construction of SROs was banned in New York City. This effectively reduced the number of SROs, a significant stock of available housing units, from the city's housing stock, limiting its use only to non-profit and educational institutes. In 2011, approximately two million New Yorkers were estimated to occupy some form of shared housing, either with other unrelated adults or mostly with relatives. Another 33 percent of housing units in New York were estimated to be occupied by single adults living alone. With the high proportion of their income being consumed in paying the rent, there is an obvious tendency to share the apartment with more individuals, maybe even illegally, to reduce the overall burden from rent. Those unable to share, have also been forced to become homeless.

However, high rent burdens were not a standard phenomenon always. The social construct for housing was not as rigid it is today. In the early-nineteenth to the mid-twentieth century, workers and immigrants could rent out single rooms, or even beds in cities if they willed. These were available at extremely reasonable rates with only options for even just a night-stay. These units had shared bathrooms, kitchens, and other such amenities. Many such

establishments offering lodging services to single adults and small families collectively began to be known as SROs in the 1930s (Aberg-Riger, 2018). As the SROs existed between the mid-nineteenth century in major cities, single-adults or two-member families could choose to live small in the urban centers filled with these establishments in terms of lodging units, hotels, or even rental housing. They were prevalent in cities like New York City, Chicago, San Francisco, and others until the mid-twentieth century. At the latter end though, the landlords started illegally sub-dividing their apartments and letting out single rooms to low-income families. The rooms were not designed to accommodate larger families. Hence, the sub-optimal room sizes coupled with the increasing cost of housing forced large families to live in overcrowded conditions. This sparked a health concern owing to uninhabitable conditions caused due to overcrowding situations. To curtail the issue, the typology was phased out by introducing a minimum size of units, and other regulations to establish density control in New York City, a law still under practice (Sullivan & Burke, 2013).

The laws introduced thereafter, were stringent and aimed at curtailing any chance of a resurgence of such conditions. However, the mere size of apartments cannot be blamed, but rather the market forces played an important part in causing the SROs to gain a bad reputation. The laws banned construction of new SROs in certain cities, and on the other hand, facilitated existing homeowners to convert their apartments into luxury apartments. Cities such as Chicago, New York City, Seattle, Portland, San Diego, Denver, and many more across the US, collectively lost about one-million units due to these laws (Aberg-Riger, 2018). It is important to understand here that the sheer loss in the number of SRO housing units available, did not extinguish the demand for them. The fact that these were popular and supplied in great quantity by the market, was because they were functional and affordable. Those that were affected, then

started living in similar situations informally, and many a times illegally (Perine & Watson, 2011).

City agencies across the US, introduced measures to keep similar situations of overcrowding from arising. They introduced zoning and density control regulations determining how many households could live in a given piece of property. Those cities with an acute problem with the SROs and the rooming units in general, even mandated a minimum size for rooms and occupancy units, to cautiously prevent recurrence of ‘small’ rooms shared by more than one person. To ensure a minimum provision for light and ventilation, the rooms were mandated to be allocated at least one window (of commensurable dimensions) per room. However, these regulations have been necessary and instrumental in ridding the cities of the serious health issues. The regulations were implemented fervently to eradicate remote chances of recurrence of the overcrowding situation, but the move adversely targeted the occupancy of the SROs and small-housing in general.

Further, as cities in the US were in the phase of suburban movement, the dependency on private vehicles was high. As a result, even the cities were designed with a minimum parking requirement, which still exist in most parts of the cities. With the sheer number of regulations, complexities, and minimum space requirements, the real-estate developers often find it difficult to comply with the regulations, making small housing more expensive to build. As homeownership and subsequently rental values became expensive, costs trickle down to the eventual renters, making it oftentimes unaffordable for a household with modest means to live in a well-connected neighborhood. These contingent costs are unavoidable as they are a direct response to the market. Housing is not planned solely on the basis of the proximity to transit options. With the decline in transit ridership, and popularity of ownership of private vehicles, the

provision of mandatory and minimum parking is logical. Table.2 highlights that the proportion of people owning private vehicles has increased (or has only negligibly decreased), while the transit options in each of the cities are losing their ridership, proving the continued dependence on the private vehicles as a primary mode of commuting.

City	2015 HH w/o vehicles	2016 HH w/o vehicles	2016 - Unlinked Passenger Trips	2017 - Unlinked Passenger Trips	Change
Atlanta	15.2%	16.4%	131,658,153	128,250,083	-2.6%
Boston	35.4%	33.8%	395,321,335	382,893,037	-3.1%
Los Angeles	12.1%	12.2%	572,145,356	541,015,802	-5.4%
New York	54.5%	54.4%	4,191,902,662	4,147,327,410	-1.1%
San Francisco	31.2%	29.9%	390,307,851	385,364,770	-1.3%

Table 2: Change in Percentage of Households without vehicles between 2015 and 2016 in selected cities; and Change in number of Passenger trips in transit between 2016 and 2017 in corresponding MSAs..

Source: *Car Ownership in US Cities Data and Map* (2016);
Unlinked passenger trips in cities (Schmitt, 2018)

Today, with the changing demographics, one can observe a sharp rise in the movement back to the city, especially the chosen cities in this research (excluding Atlanta). As researched by Luis Mejias (2015), markets have the potential to fulfill the housing demand, but as the regulations skew the functionality of the market, not as many units are being produced in high-value markets such as San Francisco. He paraphrases Edward Glaeser, professor of economics at Harvard University and author of *Triumph of the City*,

...if regulators and activists "unleash" developers, the market will solve the housing crisis. (Glaeser 2011, pp. 193). Plenty of land constrained cities have found ways to house their burgeoning populations, usually by building up and more densely. (Mejias, 2015).

Mejias's research indicates that the development control regulations such as those for high density, give rise to additional measures such as Environmental Review. If developers, through the use of bonuses (e.g. density bonus in exchange for reservation for low-income households) or compensatory measures (higher allowable height in exchange for open spaces on the property for the public), develop the property more than that allowed by the as-of-right zoning, then they would be subject to the Environmental Review process. The review process is time consuming, expensive, and a tool used by opponents of higher density to stall projects. In such a scenario, even if the market would want to develop apartment units, conventional or small-housing, the developers would not be able to provide for it. However, development bonus is necessary to incentivize developers to build Affordable housing (housing that is available below market-rates and is subsidized for low or middle-income households). The Environmental Review also serves an important tool to preserve the citizen's right. The board scrutinizes if a said developer fulfills the promises and is mitigating the impacts caused on the immediate environment.

In spite of these regulations and mandates, to then provide for a profitable, yet affordable housing solution, the developers are at the mercy of city, state, and federally financed affordable housing schemes. However, the funding available under these schemes is often limited, and competitive. Many of such projects require a huge capital investment, and hence only large developers with a solid backing are able to compete for these projects. This pushes the smaller,

more nimble developers, working for a smaller profit margin, out of the affordable housing market, thereby further pinching the supply.

John Infranca (2014), Associate Professor of Law at *Suffolk University*, conducted a study on ‘Regulatory Challenges for Micro-Units and Accessory Dwelling Units’. His research involved a comparative study of regulations on micro-unit apartments and Accessory Dwelling Units (ADU) in five cities, namely Austin, Denver, New York, Seattle, and Washington D.C. He observed that although developers and city planners have encouraged the development of these units, the regulations have, to a certain point, restricted its growth as what could be commensurate with the market forces. With a growing number of single adults, city planning officials are looking for opportunities to update their housing stock, which currently provides for housing families. Even units with two-bedroom and upwards are being increasingly occupied by single adults living in room-mate situations. In such a scenario, allowing for more micro-unit housing can help replenish the housing market with homes suited for single-adults, and releasing the pressure from the other conventional unit types. However, the micro-unit housing is expensive in terms of its value-ratio, and if such units are to be developed at a large scale, then the prices in neighborhoods stand a chance to rise exponentially. Each of the surveyed cities, had a high percentage of people paying more than 30 percent of their income on housing costs, a.k.a. rent-burdened households (HUD, 2014).

This theory of direct and positive correlation between land use regulations and rising housing costs is explored and substantiated in a paper published at The Wharton School, at the University of Pennsylvania (Gyourko, Saiz, & Summers, 2007). The authors highlighted the rise in construction costs based on the intensity of land use regulations. The variability in prices could be associated to the level of authority imposing the regulation, local housing regulations

and growth measures, and the change in the time factor over the years to allow a building proposal to go through. However, during their research the authors also observe that some of the densest regions have some of the least strict regulations. The intensity of regulations that either promote or restrict density however are based solely off a society's reference point. While local city governments in the US regulate the minimum housing sizes to be in the range of 200 sq.ft., those in Asian countries like China, Japan and India, or certain European countries such as the UK, Germany, Berlin and many others do not regulate minimum unit sizes allowing for units as small as about 100 sq.ft. (Weller, 2017).

Theorists have discussed ideas that the 'minimum' unit size is but a perceived standard, and if left to the market, they would emerge with an optimum size. The study, '*How Small a House?*' (Nolan Jr. & Horack Jr., 1954), although a dated report discusses a relevant contemporary issue. It discusses the proceedings of the *Lionshead Lake, Inc. v. Township of Wayne* case to make an argument that mandating minimum unit sizes could be unlawful, unless done for reasons of mental and physical health. Even the absolute size of the SROs never was a problem, until a situation of overcrowding due to rising industrialization and a movement of low-income workers to the city core. It is possible that the issue could be limited to concerns of health, safety, and security, rather than an absolute size.

Gabbe (2015) looks at several regulatory barriers in San Francisco that limit the development of micro-unit apartments. In the research, the author discusses that in addition to the minimum-space requirements, local governments have mandated minimum parking requirements, inclusionary zoning, and open space requirements in most parts of the city, thereby limiting high density development. Besides the limitations of minimum room size, the development in the small-housing category is difficult even due to limitations in the development

of group housing. But, each of the regulations too, are important for ensuring equitable and sufficient distribution of well needed resources

In their recent study, the Furman Center (Stern & Yager, 2018) discusses the issue of small-housing in further detail. Using the backdrop of New York City, the research looks at some of the benefits that the SROs provided, and how they are lost as planners try to make regulations to shape the city by holding on to its past. A follow-up policy discussion organized by the Furman Center drew light on the high demand for small-housing in New York City, and how the city agencies must allow the market a flexibility to formulate a new unit type, while performing checks to not allow for it to go down the SRO path.

This literature review reveals that there exist regulatory barriers that control the development of small-housing. The concerns emerge out of health and safety issues that were prevalent in the SRO developments in the mid-twentieth century. Further, the regulations devised to curtail one issue, are currently impeding with the development of a unit typology that is proposed by many to be the ideal solution to fulfilling the housing demand in high-value markets, especially in a landscape where the demographics are changing to have a greater proportion of single adults. However, these studies in isolation are unable to explain several key concerns such as:

- a) Is providing small-housing and building for more density sufficient to satiate the housing demand for the changing demographics?
- b) It is proposed that markets could fulfill the housing demand if all regulations were relaxed.

While something to that order can be observed in the Asian and European countries, there have also been observed instances of overcrowding and poor sanitation in that context.

c) There seems to be no guarantee if a higher supply of housing in downtown locations would solve the problems of housing affordability.

Unit-type, its size, and its configuration in a building, and the overall location, determine who lives in the unit, the community (of households within). The regulations and the consequential cost of construction is incident on these factors. As the cost of construction goes up, so does the value of the rentals, thereby limiting the class of people that could move-in. Further, to afford living in a high-value neighborhood, citizens are ready to compromise on their overall living space. It is then crucial to understand the impact of the regulations on the development of units in the small-housing typology, and the lives of a population, a growing proportion of which are single adults. The regulations are also built on a history and for the purpose of preventing the recurrence of issues of the previous century small housing. Hence, it is essential to navigate through them carefully to then suggest mitigation methods.

Through a series of demographic analyses, review of local development policies in the selected cities, and interviews with officials in relevant city agencies and subject experts, the thesis tried to fill-in the above gaps.

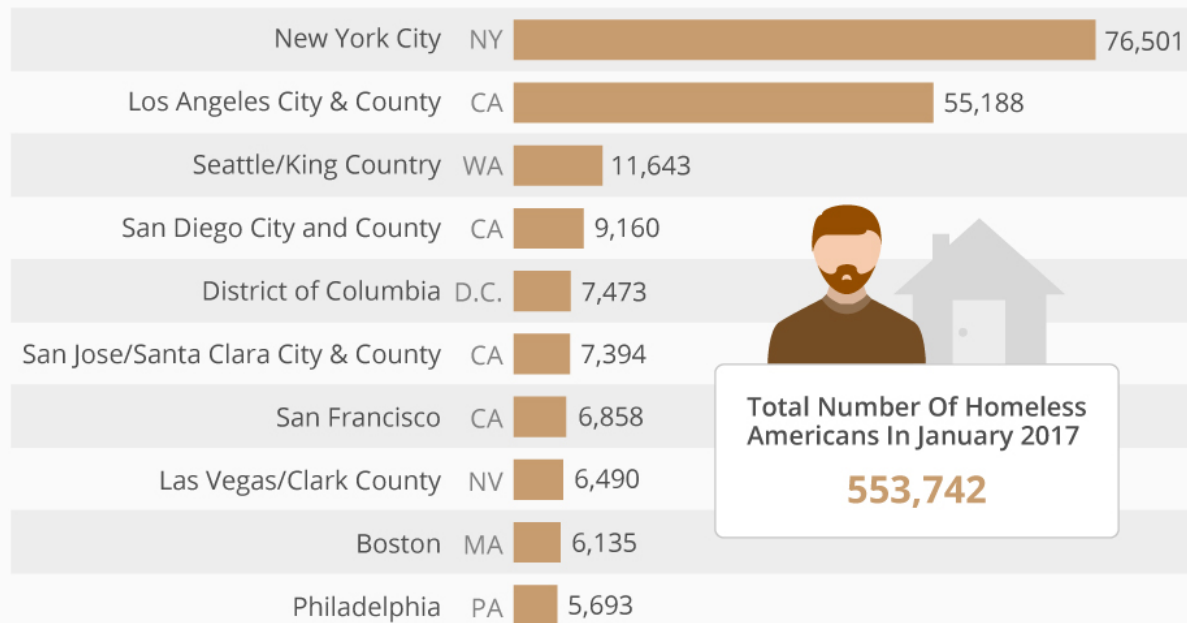
Demographics

With an aging society and decreasing family sizes, there is a steep rise in the number of young and older adults living alone (Magnus, 2009), (Perine & Watson, 2011). The individuals in the younger subgroup are probably just out of college, first-time professionals, or beginning families, and depend on limited resources to fund their living expenditures. On the other side, the older generation too, is increasingly dependent on pension support or have other liabilities to attend from their limited savings accrued during periods of stability. Hence, each subgroup of single-adults is pressed for finances and expresses a desire to live in affordable homes.

In New York alone, over 436,000 single adults in 2015 paid 30 percent of their household income on housing costs (i.e. were rent burdened), and over 250,000 single-adults were severely rent burdened i.e. paid more than 50 percent of their income as housing costs. Around 85 percent of rent burdened single-person households have ‘low-income’ as per the affordability standards set by the HUD. Furthermore, over 437,000 live with unrelated roommates, and over 310,000 of them are low-income or moderate-income households. While some do so at will, others do it as they have no choice but to do so to reduce the rent. And would choose to live alone if possible. Finally, over 20,000 adults occupy homeless shelters, and about 100,000 live in other illegal settlements as SROs or converted basements, etc. (Furman Center, 2018). As can be seen on the chart on pg.27, New York City has characteristically the highest number of homeless population, followed by Los Angeles, San Francisco, Boston and other cities not under consideration in this thesis. Coincidentally they all make it within the top-10 rankings in the number of homeless population. While, the need is for affordable housing, it clearly is not being satisfied by the current supply (Maryann, 2001).

The U.S. Cities With The Most Homeless People

CoCs with the largest numbers of people experiencing homelessness in 2017*



@StatistaCharts

* CoC-Continuums of Care are local planning bodies who coordinate homelessness services in certain areas

Source: U.S. Department of Housing and Urban Development

statista

Top 10 cities with homeless population.

Source: Statista.com (McCarthy, *The U.S. Cities With The Most Homeless People*, 2018)

Traditionally, the ‘apartment’ typology is the primary housing option in high-value cities. These apartments range from small – studio or one-bedroom apartments, to large apartments consisting of two-bedrooms or more. Most housing available today in the cities (in US) was built to accommodate traditional families (Counsel’s Office, NYS Dept. of State), but with a large and increasing population of adults living alone in major cities (for example, as of 2014, New York, Washington, San Francisco, Denver and Seattle have at least 40 percent of their population living as single adults), there seems to be a mismatch between the demand for a housing type and its availability (Merkel, 2014). Both subgroups express desires to be located in the neighborhoods with authentic urban characteristics and recreational facilities, and being located in proximity to transit infrastructure to enable them to move across the city (Westcott, 2014), (Urban Land

Institute, 2014). As neighborhoods offering such infrastructure are priced prime, the cost of rental and ownership real estate is comparatively higher. To afford living in such neighborhoods, some of these individuals are ready to trade-in the overall size of the apartments. By compromising on the overall area, the eventual rental value of the apartment could be reduced. This willingness for trade-off establishes the market for optimal living units, packaged as small units replete with facilities that are then marketed as stand-alone ‘micro-units’, or shared apartment with efficiency rooming units, or group-housing units.

Further, the demographics in dense and high-value urban centers are also seeing an increasing trend in the transient population (Maciag, Mike, 2018) due to the factors of affordability. With changing household sizes and needs, individuals move out relatively less pressured neighborhoods away from the city core. And the turnover for such a temporal population in core neighborhoods is in larger numbers. With a limited budget, and a transient need, the individuals invest lesser in the neighborhoods that they live in, which triggers the NIMBYistic attitudes from the relatively permanent neighbors who invest consistently.

Small-Housing: Micro-units, Efficiency-units / Micro-suites, and Shared-housing

In 2014, the Urban Land Institute studied the development of the micro-units and other efficiency-unit models. The optimum physical space in these units is not clearly defined, but they have a typical characteristic of being about 20 to 30 percent smaller than a conventional unit in a similar configuration. The size of such units cannot be established as it is subjective to the context that they are located in. So, while in New York City, the micro-unit apartments range from 275 to 300 sq.ft., in Midwestern and Texas markets they are sized between 400 to 500 sq.ft., while in Boston they are about 450 sq.ft. and so on. The efficiency is attained by introducing shared facilities and/ or collapsible furniture such as murphy beds (see glossary), retractable closet spaces, etc. as can be seen on pg.23. The units in this typology range from a micro-unit i.e. an efficiency ‘studio’ with a small kitchen and a bathroom facility in-house, to a single or a multi-bed apartment with/ without a bathroom included in each room or a shared bathroom and/ or a shared kitchen. As is the case for differential pricing between the value ratios (rent per sq.ft.) and the apartment size, a studio costs more per sq.ft. than a one-bedroom, a one-bedroom costs more per sq.ft. than a two-bedroom and so on. Keeping with that, the efficiency units, although smaller, cost slightly higher per sq.ft. as compared to their conventional counterparts (Urban Land Institute, 2014). This premium could also be justified as fees for the extra effort and cost incident on the homeowner for the maintenance and upkeep of the shared facilities. And due to its reduced floor space within a unit, these units end up costing less than a conventional apartment of comparable size in the same neighborhood. Hence, for a young urban professional who may choose to spend late hours at work or for recreation, or a person in their mature age who is unable to maintain the unit at full capacity, these facilities could prove to be helpful to maintain a functional lifestyle. As the extra facilities come at a trade-off for available

square footage, the residents make a conscious decision to live with minimal belongings that could be stored in the limited space available. As these units are typically located in prime locations in the proximity of amenities, transit, and a bustling downtown with commercial and recreational facilities, the residents worry less about getting around to keep themselves occupied.



The small-housing projects – with standard fit-out furniture, collapsible murphy-beds, and kitchen appliances. The spaces are flexible for optimum use during the day.

Source: A closer Inspection of Micro Units (2015), Elegran.com

Efficiency units as these, or that utilize the concept of shared living have long been a part of the urban fabric in the US. The SRO units, during the mid-nineteenth century to mid-twentieth century, proliferated throughout some of the major cities in the US. They allowed for citizens, or visitors, or sometimes even small families to rent an ‘affordable’ space in some of the high-value cities. As landlords began to subdivide properties and rent out the units of such scale to low-



A conceptual rendering of the small-housing projects.
 Source: *Micro Units Are Coming to Queens (2015), The Wall Street Journal*

income families with a large household size, it led to the issue of overcrowding in these units, which eventually bred unsanitary conditions leading to health problems, eventually causing the word ‘micro’ or ‘small-living’ or ‘shared-housing’, and its like, to become a taboo (Sullivan & Burke, 2013). The Local and State agencies phased these SRO establishments out by the mid-

twentieth century. However, the ‘new breed’ of small and partially shared market-rate housing is gaining traction. To improve on the negative image associated with efficient living, these apartment units offered in the category of ‘small-homes’ are often fancier than conventional apartments, simply for the fact that they are often in some of the best locations, and have most necessary amenities pre-fitted, a key factor for the model. Small-housing units like these are not just developed in US cities like Boston, Los Angeles, New York, San Francisco, Seattle, Washington DC, (etc.) but also internationally in cities such as Hongkong, Tokyo, London, Amsterdam, Berlin, and many more. However, with a variety of small-housing unit types, it could also be considered as a state of living, small-living. Small-living conditions could be created in micro-unit type studios, efficiency-units, formal or informal group housing arrangements, an SRO, basement tenements, ADUs a.k.a. garage tenements, etc. This range and a high occurrence of informal arrangements make it difficult to track the exact number of small-housing in any city.

Development

As discussed above, ‘small-housing’ is not a recent concept. Corresponding laws mandating the size of units were established across cities in the US facing similar issues due to overcrowding. As a result, several small-housing developers have even chosen to let go of the tag ‘micro’, to avoid negative connotations related to the absolute space and the issues of overcrowding. Rather, they choose to re-brand the contemporary version as efficiency studios, smart units, and the like (Urban Land Institute, 2014).

The laws that helped eradicate issues of overcrowding are prevalent even today. The zoning and density control regulations, along with minimum apartment-size, and parking space parameters pose a major challenge for developing small-housing units. These are supplemented by objections raised by neighborhood groups wanting to ‘preserve’ their neighborhood character, density, and property values. Citizens expressed concerns about the influx of low-income individuals, who would not invest enough in the neighborhood and yet consume the resources such as parking and recreational spaces, while bringing in an unfamiliar vibe. In affirmation of the reasons for pushback by neighbors, even the existing and potential renters of micro-units surveyed by Urban Land Institute (2014) expressed an interest only for transient occupancy in the small-housing unit type. Most of the subjects responded that they would be willing to live temporarily in one of the micro-unit apartments only for the amenities, the proximity to transit, and a lively neighborhood. In time, they expressed that they would look for opportunities to rent a larger space.

These factors lay the ground for another issue, that of financial institutions limiting investments in the development of micro-unit apartment buildings (Iglesias, 2014). They assess a higher risk value for the small-housing typology owing to the volatility of its acceptance from

both, the city officials and the potential neighbors. Hence, they instruct the developers to build for a flexible typology and provide for additional parking. If ever the small-housing typology were to fail due to regulatory barriers, neighborhood protests, or shift in the trend, the developer would be able to revert the apartment unit type to traditional housing typology without incurring additional financing. This buffer, drives the costs higher, and hence failing of the model for the target consumers (Infranca, 2014), (Urban Land Institute, 2014), (Renn & Armlovich, 2016).

Issues of minimal space and short tenure aside, there is always a segment of the population that is interested in living in the heart of the city at an affordable price, even if it means that they may have to trade-off the overall square footage of their units. In response to this ever-expanding segment that currently occupies larger than necessary traditional units by forming non-traditional families or by sharing rooms informally, and trading in their privacy, certain cities have made reforms to their regulations and codes to foster the development of small-housing units (Hurst, 2012), (San Francisco, 2013). Some cities allow for group housing or shared efficiency units. By incentivizing development of such units in high-growth urban cores, city agencies are achieving dual goals – that of channeling increased density where necessary, and protecting the sentiments of those living in the single family or neighborhoods with a relatively sparse residential zoning (usually in the outer boroughs/ neighborhoods). Due to proximity to transit, the dependence on private vehicles is reduced, hence certain agencies are even allowing for letting go of the minimal parking requirements. Furthermore, zoning restrictions are incrementally relaxed in underdeveloped neighborhoods (or those with higher service capacity on the existing infrastructure) to incentivize vertical growth of the city through redevelopment and infill construction, rather than outside the city.

These types of density provisions have allowed cities like Seattle, San Francisco, and Los Angeles to develop micro-unit apartments (San Francisco, 2013), (Kerns, 2014). As of 2015, both cities, Seattle and San Francisco have developed approximately 2,500 small-housing units, and while San Francisco continues to rapidly develop them, after the initial spurt, Seattle has imposed additional regulations to limit the growth (Beyer, 2016). As the market for such ‘rebranded’ small-housing unit type is relatively untested, there is a mixed response toward their development, making it even more difficult to assess its current value or future prospects. Even if developers would want to leverage the demand generated due to the growing demand for shared living, the cities have imposed a cap on the number of units that could be developed in one or more categories in the typology. This cap has been introduced such that developers are limited from changing the housing market too much. Nonetheless, the city agencies are aiming to facilitate long-term housing solutions for their changing demographics, and hence are open to experimenting with their regulations and codes to allow certain degree of development for the unit type (Potikyan, 2017). However, if the growth trajectory does not seem to follow the vision, the city agencies could establish additional codes to curtail the development. Simply looking at the demographics, New York City has relatively more number of young single adults and empty nesters than any other city in the US. In such a case, while the small-housing unit typology may seem the most appropriate (due to a higher concentration of the target group, as seen in Chart.1), it is not developed as rapidly as one would expect the free market to produce. Until 2018, only one project - The Carmel Place, exists as a stand-alone apartment building with 100 percent micro-units, and this project was facilitated as an initial experiment of the current mayor’s adAPT plan, under which all regulations were lifted to develop the property as a pilot project to

test the demand for micro-unit type in New York City. Similarly, regulations that govern the maximum density exist in Austin, TX (Infranca, 2014).

The research investigates reasons for diversity in the regulations imposed by the different city agencies. Can the housing demands for the rising demography be met by the provision of small-housing unit apartments, making it the ultimate solution? Or can the demand be satisfied by other long-term methods developed in sync with the existing regulations, making the micro-unit or the efficiency unit a passing trend. To understand the impact of this unit type and its relevance toward fulfilling the housing demand, one must primarily understand the implications of strategies and policies that are adopted by city agencies to control the development of small-housing unit apartments. These control policies, both for and against the development of this unit typology, must be critically analyzed to understand the consequences of modifying regulations on the well-being of the society at large.

City agencies are incrementally adapting their planning codes to develop more housing under the affordable category. However, with limited funding available from the federal and State subsidy programs, or even the conventional lenders, the production for this untested housing typology is not seen in commensurate numbers. Owing to the issues discussed earlier, the development of the contemporary small-housing units rather takes a backseat. Hence, despite development incentives, the case-study cities are not seeing a rapid development of small-housing units.

The Cities

Comparing the 2016 household data from the American Community Survey with the Population census data, it could be understood that despite a large proportion of single-person households in the selected cities, the proportion of studio apartments is far less. As many of the studios could also be occupied by couples, the actual proportion of those occupied or available for single-adults could be lesser. However, certain larger apartments such as one-bedroom could also be occupied by single adults, or single-adults could also occupy larger apartments with two and more bedrooms in room-mate situations. Furthermore, the low housing-vacancy rates in the city, give a rise to a market condition with more demand than supply. As a result, the price for housing goes up, forcing many households to pay more than 30 percent of their income on housing costs. This comparison in Table.3 draws light on the need for affordable housing options suited not just for single-adults but, all citizens residing in high-value cities.

City	Rental Vacancy Rate	Single-Adults	Studios	One-Bedroom	Rent-Burdened Households
Atlanta (GA)	8.1%	38.52%	2.86%	17.12%	50.15%
Boston (MA)	3.25%	29.87%	3.87%	18.01%	48.76%
Los Angeles (CA)	3.3%	25.65%	6.37%	19.74%	59.33%
New York (NY)	3.86%	32.51%	8.02%	30.89%	53.96%
San Francisco (CA)	2.5%	37.09%	13.95%	27.00%	42.55%

Table.3: Percentage of Single-Adults and corresponding Percentage of Studios, Percentage of Rent Burdened Households, and Rental Vacancy Rates in selected cities.

Source: B11016 – Household Type by Household Size: American Community Survey (2016); DP04 – Selected Housing Characteristics: American Community Survey (2016)

Atlanta, which has a high percentage of single adults and the least proportion of studio or one-bedroom apartments is an outlier in this comparison (and it serves its purpose), and since the rental values are substantially low, even single adults choose to live in larger apartments, sometimes by paying a higher proportion of their income on rents. The other four cities, namely Boston, Los Angeles, New York, and San Francisco are at similar levels of vacancy rate, making them expensive real-estate markets. Considering the pressure that couples add to the already saturated small housing market, it could be well understood that the disparity between the demand and supply is huge. Yet, the cities accommodate the single-adults. Through formal or many-a-times informal roommate arrangements,

In Boston, Los Angeles, and New York, the high level of disparity between the proportion of single-adults and the availability of studio and one-bedroom apartments, translates into a higher percentage of rent-burdened households. On the other hand, despite a lower vacancy rate and a higher percentage of single-adults, the fact that San Francisco has higher percentage of studio apartments, has translated into lower proportion of households being rent burdened. This analysis thereby supports The Wharton Index analysis (Gyourko, Saiz, & Summers, 2007), wherein San Francisco is also a city with a low intensity of regulations (as compared to others in this thesis), and hence the development is more aligned with the demand from the demographic.

Through a review of secondary literature posted on the city's relevant website, and through a series of interviews with key personnel in the city agencies and subject experts, a database of regulations for controlling the development of small-housing units in the five selected cities is discussed below:

Atlanta

Atlanta has the least dense neighborhoods as compared to other cities in this thesis. The city's zoning codes have seen a few amendments since 1981 in terms of its housing, and hence, majority of the zoning classification is still predominantly suburban. The built environment that has developed through the years, does not even reflect the underlying zoning classification. Neither does the city's regulations follow the Euclidean Zoning principles, nor does it follow principles of form-based zoning. It is hence understandable that the city is still in the phase of suburbanization and the citizens prefer moving outward.

To cater to the lack of affordable housing, the city is currently targeting easier and achievable modifications to their existing planning code. In December 2017, the city passed a law to allow properties below the R5 residential zoning to develop ADUs. The city is currently in the process of allowing the same for the more commonly found R4 zones. In addition, the city is specifically encouraging development of all unit types in the apartment typology around the Beltline project. This newer development is aimed at providing affordable housing to a large proportion of citizens. With a higher FAR value and high allowable density, the city requires developers to provide a certain proportion of the units in the affordable housing category under the inclusionary housing agenda.

While developers discuss the potential for small-housing, they remain largely unsure. With a high rental vacancy rate, the city's real-estate market is soft and is relatively 'affordable' as compared to other high-value markets. With planned development to revitalize the downtown region, the City of Atlanta plans to re-direct the growth inwards. Once neighborhoods in the city core begin to densify, and the housing demand grows giving rise to higher rental prices, the city would planning agencies would plan for a housing stock in the small-housing category.

Boston

Boston has experimented with its regulations to allow a certain degree of development in the small-housing category. However, they are limited only to micro-unit type, and the regulations do not allow for group-housing or co-living apartments. The City of Boston established the Housing Innovation Lab (HIL) in 2015 to work on the plan called ‘Housing A Changing City: Boston 2030’ plan for furnishing housing needs of 700,000 people by the year 2030. The HIL works with developers and city planning agencies to adapt regulations to accommodate higher densities and allowing for building more compact units, not just for the younger generation, and not just micro-units, but all unit types in general for all citizens (Housing Innovation Lab, 2016)

The HIL launched a study in 2016 to analyze the development potential for small housing units in general ranging from 600 sq.ft. one-bedroom apartments, to 950 sq.ft. two-bedroom apartments, and the policies that must be formulated to allow for these. Boston allows for micro-unit developments within the South Boston Innovation District, where units with a minimum size of 350 sq.ft. are permitted. These units are smaller than what current regulations permit and are intended to enable young professionals to continue living in the city. Boston has also reduced minimum sizes to 450 sq.ft. for housing units within one-mile from public transportation in several Transit Oriented Zones (Infranca, 2014). The city has collected large data samples from people who have expressed interest in living in small-housing units, and the HIL is now investigating best practice models with respect to health and safety practices to avoid the issues that the SROs went through. The HIL is also developing aesthetic guidelines to ensure that the buildings with these efficiency units look similar to the ones housing regular units, thereby ensuring less pushback from the neighborhood communities that are put-off by new development

that looks radically different than those already existing in the neighborhood. The HIL also mandates several open space requirements for the similar purpose of avoiding neighborhood clashes for open space. The Article 80 mandated by the Boston Redevelopment Authority in 1996, clearly instructs a procedure for the development review process, which empowers neighborhood communities to voice their opinions on any development.

Boston has seen the fragmented development of a few ‘innovation units’ of about 600 sq.ft. at 63 Melcher. Units of about 385 sq.ft. at the Urban Housing Unit project (Housing Innovation Lab, 2016), that in this thesis, is considered under the micro-unit type, have also been constructed but were rented out to students. The city has also seen the units develop at 1047 Carmel Avenue, which has micro-units in an SRO type condition, but was developed due to a loophole in initially drafted regulations. However, the city has not seen a single unit being developed under the small-housing typology since, even though the regulations permit it.

Los Angeles

Small-housing has not caught much traction yet in Los Angeles. This has mainly to do with the density control regulations, the minimum parking requirements, and certain minimum size and use restrictions. Efficiency units with shared facilities such as kitchen must conform to the California Building Code §R304 which mandates a minimum of 220 sq.ft. of living space exclusive of a bathroom and storage closet. The Adaptive Reuse Ordinance restricts re-development projects to create housing units less than 450 sq.ft. and mandates an average unit size to be 750 sq.ft; and those in the Hybrid Industrial zones could not be developed unless they are a minimum of 750 sq.ft. and include Live + Work spaces. Furthermore, with higher density, the developers would have to pay mitigation fees for the higher density being brought to the neighborhoods.

Recently the city of Los Angeles passed a regulation for the Transit Oriented Communities (TOC) Guidelines. Under these, prime locations such as Downtown LA and Hollywood would have relaxed density caps and parking requirements. However, developers claiming the benefits of increased density, must allocate between 10 percent (Extremely-Low Income in Tier-3) to 25 percent (Low Income in Tier-4) of their units for affordable housing, depending on the target income range and the underlying residential zoning. Meeting the affordable housing requirement, would also allow developers to be exempted from linkage fees for the project. Even the parking regulations have been relaxed in these neighborhoods, and a developer could provide as few as 0.5 parking spaces per dwelling unit (in Tier-3) to absolutely none (in Tier-4). The City has also passed a law for the Unapproved Dwelling Units (UDU) under which, if a homeowner illegally subdivides a house to create rooms for renting, the city instead of reprimanding the owner, would legalize the subdivision if it follows certain criteria such as, a) the property must lie on an underlying zoning for multi-dwelling residential, b) each of the rooming units must conform to the health and safety regulations and must be a minimum of 120 sq.ft., c) the total density in such a property could not exceed by more than 35 percent of what is permitted by the underlying zoning, and d) the homeowner must allocate certain units to be affordable through the mechanism of rent control rules (LA City - Dept. of City Planning, 2015).

Besides conversion of multi-family homes into smaller rooming units, Los Angeles has seen the development of micro-units in only one property built with 438 units in downtown LA's Arts District neighborhood. The building, One Santa Fe, houses a mix of unit types including micro-units that go as small as 343 sq.ft. (Central City Association of Los Angeles, 2018).

New York

Among the cities being compared, New York City has the most regulations in place to develop new housing that may not follow the underlying zoning. New York City has had the most setback in its housing stock due to the discontinuation of the SROs. The gap between approx. 210,000 small units available, and approximately 1.2 million single-adult renters keeps widening (Stern & Yager, 2018), and we see a growing proportion of single-renters living in roommate situations. Mayor deBlasio, under his 2018 Housing 2.0 Plan, proposing to bring 300,000 affordable homes to the city by 2026. With an investment of about \$2 Billion toward fulfilling the housing needs, it is by far the only city with such a magnitude of city's budget allocated to fulfill the housing needs. However, the development is mostly channeled toward development of all unit-types. The many regulations and other incident causes invariably impede the development of small-housing in a city that probably needs the most of them owing to a large number of single-adults as compared to other cities in the US. With the 'Zoning for Quality and Affordability (ZQA)' update to the zoning code, published in March 2016, the city got rid of its minimum unit size requirements, thereby allowing the Carmel Place development (described below) to be built and occupied, but other regulations limit the rapid development of the small-housing typology. The density control regulations pose the biggest hurdle to a high density development of these unit. The allowable Floor Area Ratio (FAR) in multi-family residential zones R-6 through R-10, is currently devised to allow only development of dwelling units with an average of 680 sq.ft. The single-family or two-family residential zones (R-3), have a lower room size limit at 625 sq.ft., allowing for a maximum of two families. As a result, developers are forced to develop a mix of apartments even in high-activity zones (Dept. of City Planning - New York City, updated.2018). The building envelope and setback requirements also limit the

development potential of several corner and irregularly shaped lots that could otherwise be utilized for a compact development of small-housing. Furthermore, the city limits the ownership and occupancy of the SROs to non-profit organizations and educational institutes, and even those units are rent controlled (Sullivan & Burke, 2013).

As the regulations are not as easy to navigate, the actual production of housing is not in sync with the growing urban population. The Dept. of City Planning is trying to modify the existing regulations to ease the pressure on developers. Although the density regulations remain in place, the city has relaxed the rigid minimum-size regulations, allowing for developers to build small-housing units in mixed unit type development. The city is also trying to relax the minimum parking requirements in high-density neighborhoods such as Manhattan Core, Long Island City, etc. (Infranca, 2014), which are located in the proximity of transit infrastructure. As a result, the city has also spawned the development of co-living spaces such as WeLive (described below), which was developed under the as-of-right regulations, optimized for high-density development.

Through the launch of the ‘adAPT NYC’ competition in 2012, the former mayor (mayor Bloomberg) invited entries for designing, constructing, and operating a micro-unit housing development on a city owned property. The city relaxed most of its regulations such as the density limits, minimum unit size, and parking requirements, to test the development potential for the unit type, giving birth to the Carmel Place development in the Kips Bay neighborhood. The 55 rental units range from 260 to 360 sq.ft. and have about 40 percent of the units (22 units) reserved for affordable housing program (nArchitects, 2016). By far, this is the only stand-alone micro-unit development in the city. Several other group housing projects have begun to spring up in Brooklyn and Manhattan. Co-living spaces such as those designed by We Live and Common,

are also gaining traction and are operating almost at capacity. The WeLive development at 110 Wall St. is a group housing development with units ranging from a 300 sq.ft. studio to a 980 sq.ft. four-bedroom apartment. With approximately 1,000 beds, WeLive caters to a mix crowd of young urban professionals and small families alike. The small-housing units (studio and one-bedroom units in this property), contain a bathroom and a kitchenette, and the residents depend on the larger, shared-kitchen facility for a full range of function. The property does not offer much parking, as many of its residents do not own a car. Many such properties are in development in parts of the city.

San Francisco

San Francisco has seen substantial development of all unit types in the small-housing typology. With about 2,500 units built in typology (Beyer, 2016), property in San Francisco is being occupied sooner than it is being built and could be explained by the low rental-vacancy rates. There are only a few regulations that restrict the development of new small-housing or SROs in the city. They are mostly those related to density control regulations, mix unit-type requirements, minimum parking requirements, and building envelope setback restrictions. Although group-housing developments are exempted from mix unit-type requirements, they are subject to the inclusionary housing program if they include 10 or more bedrooms. Even the new SROs being built under group housing and those that have existed since San Francisco's hotel-city days, are under rent-control regulations, and hence, many buildings are deteriorating. The actual number of hotels that provide the SRO unit type have been declining over the years.

In a city with high construction costs owing to the high-intensity of regulations, followed by a high-demand market, the housing prices reach a unprecedented high (Pendall, Puentes, & Martin, 2006). In response, the city is trying to adopt regulations to foster the development of

small-housing units. Such as, in November 2012, the San Francisco Board of Supervisors reduced the minimum size of a dwelling unit to 220 sq.ft. (Infranca, 2014) in line with the National Building Code (NBC) requirements. The city also allows for legalization of unauthorized modifications to convert homes into smaller units, provided the each of the rooming unit is in compliance with the health and fire safety regulations, and the incident number of units are let out to five or fewer unrelated adults. If however, the number of tenants is higher, then the regulations demand the property to be converted to a group housing, which has its own applicable laws pertaining to affordable housing and mandatory inclusionary housing requirements ranging from 12 to 25 percent for a development with more than 25 units. The city is also allowing development of SROs and other group-housing development that would provide exclusively serve the housing needs of the homeless.

San Francisco's Planning Code §318 has capped the development of efficiency dwelling units with reduced square footage (micro-units) at 325 units, after which the Planning Department in collaboration with the Mayor's Office of Housing shall submit a report to assist the Board in determining the potential of such units. The Dept. of City Planning had approved 120 micro-units until March 2018, such as those at 1231 Mission Street. However, all of those units were converted to student-housing prior to occupancy and hence, the city has zero micro-units developed toward the cap. However, the city has seen a lot of development in other small-housing unit types such as group housing, or other efficiency units with shared facilities.

Issues

Further discussions helped address queries raised at the end of the literature review. The following list of interviewees guided the research and its findings are described below:

- Blaine Ford – Community Manager at WeLive, New York City
- Carly Grob – Senior Planner at the Office of Executive Programs (Dept. City Planning), San Francisco
- John Infranca – Author of *Housing Changing Households: Regulatory Challenges for Micro-Units and Accessory Dwelling Units*. *Stanford Law and Policy Review*. 25:53, 53-89.
- Katherine Dunham – Adjunct Associate Professor at Columbia University, New York City
- Kristy Wang – Community Planning Policy Director at SPUR, San Francisco
- Marcy Ostberg – Senior Planner at the Housing Innovation Lab (HIL), Boston
- Matthew Glesne – Housing Planner at the Dept. of City Planning, Los Angeles
- Matthias Hollwich – Partner and Founder at HWKN Architects, New York City
- Nathan Gallentine – Planner at Canvas Planning Group (Comprehensive Plan Consultants), Atlanta
- Neelima Panoli – Project Manager at Dunham Wolf Real Estate Services, New York City
- Sandy Hornick – Ex. Director for Strategic Planning and ex-Zoning Director at Dept. of City Planning, New York City
- Sarah Watson – Deputy Director at Citizens Housing Planning Council, New York City
- Vidhee Garg – Principal at Affordable Housing Institute, Boston

The regulations posed by the city agencies are developed through a history. While the cities have had some unpleasant experiences with the SROs, their planning departments are simply being cautious to avoid the recurrence of such a condition. The city planning agencies and their housing experts are hence regulating the functioning of the SROs. As an added measure for new development, minimum-size requirements, mostly larger than that mandated by the

National Building Codes, are introduced for all unit types within the small-housing typology. However, despite relaxing the minimum size standards, certain cities such as New York City are struggling with the development of small-housing. This is mainly due to the density requirements. Higher-density requires a higher level of public infrastructure to support it. Simply allowing for more units to be built on the available land may not necessarily work as the most ideal solution for a variety of reasons. Allowing for a higher density adds pressure on civic infrastructure such as public service, roads and parking facilities, transit network, open-spaces, schools, etc. As has been researched by Urban Land Institute (2014), small-housing units are occupied mainly by a transient population looking at moving out as soon as they have the opportunity to (with an income rise, or an expanding household size). It was analyzed that due to this inherent characteristic, they are less likely to invest in the neighborhood, however, are the largest group consuming the facilities. As a result, the NIMBYistic attitudes of the neighbors could be justified to an extent. The density restrictions limit the developers to build in all units in the small-housing category despite the rise in the number of single-adults. Although, the regulations skew the market forces, it minimizes the risk of prime neighborhoods being occupied primarily by individuals in this category. Cities actively promote a mix of unit types as it reduces the load of providing infrastructure services to any one neighborhood in particular. However, as the consumption from new development would be higher, several cities also demand a higher impact fees from developers to offset the cost of infrastructure investment by the city.

The five cities have not evolved as much to ensure that everyone can be independent of private vehicle ownership. Even though most of the small-housing units are planned in locations in the proximity of transit, as discussed above, there are limitations on developing only for the said category of people. Until all commuter trips could be catered to either by transit or other

platforms such as shared vehicles, waiving off all parking requirements is a difficult task. The relaxed parking requirements could work in situations where most basic amenities are provided at a walkable distance. However, the presence of such amenities drives the living costs higher (Fennell, 2015).

As seen in most cities above, larger units in the conventional category have been, at times, converted into smaller units. However, the same cannot be planned in the reverse order. It is often difficult to plan for small-housing and convert it into a conventional typology. Due to the untested market conditions, financial institutes are wary of funding construction with a higher proportion of small-housing units. To minimize the risks, the lenders often direct the developers to design for a ready conversion of the smaller apartments, back into the conventional unit type, if the situation demands. Building in parking requirements for the larger unit, is also an added expense for the developers. Hence, building in for contingencies to get funding from financial institutes and lenders, eventually results into high construction costs.

The zoning codes and development regulations are devised imagining that an individual's needs are static. However, the desires and needs of people change as they progress through their lives. Depending on the household size, income characteristics, and living preferences, an individual could prefer to live in larger or smaller, closer to transit or closer to parks, in a particular school district or in a particularly active neighborhood, etc. and the current system allows for the individual to re-locate as per their phase in life. As a result, individuals in their younger or later years would not choose to invest time, money, or energy for the development of their neighborhood. This causes a deterioration of the character of the neighborhood, posing an additional reason for pushback from neighborhood organization. As the argument made is valid on certain grounds, and as the city agencies are answerable to these organizations, the cities are

not modifying the regulations to allow the market to develop small-housing at a large-scale. Even if their regulations allowed for the development of small-housing units, there is little guarantee for their success. As individuals prefer to live by standard set by themselves, they may choose to live in an apartment that may be atypical to the way a median person in their category would choose. As choice is a matter of personal taste and limits, defining a housing type to a demographic trend, would be inappropriate. In that case, promoting the development of small-housing could be a skewing of the market, especially when the exact demand for small-housing is unknown.

While it is understood that the demographic composition is changing to include a higher proportion of single-adults, the history with the SROs, and the uncertainty of newer development of small-units on similar lines, makes the financial institutions reconsider their funding. With limited availability of financial resources in the market, the lenders prefer to back projects with a higher certainty, rather than a development with a sizeable proportion of small-housing units. This discourages the developers even more, forcing them to develop regular unit types, despite a higher profit margin in the small-housing market. The lack of assurance could be justified due to the uncertainty of the human behavior to a certain extent. While the small-housing units may be created for occupancy by single individuals, it is difficult to track the occupancy status of every unit. Currently, several units in the conventional typology in high-value cities are occupied by more than the number that they were ‘designed’ for. *Ceteris Paribus – all else equal*, a higher density development of small-housing could lead to a higher number of units being illegally occupied by more individuals than planned for, living either as temporary guests, or incident family members. It would be impossible to track the occupancy, or to challenge such arrangements. This not only adds additional pressure on the neighborhoods, but also increases

the risk of creating a scenario for overcrowding, which is the primary concern of city planning officials regarding the development of small-housing.

Prices in the real-estate market are driven based on the location to the infrastructure and amenities. The characteristics of small-housing, preferentially base its development in neighborhoods that are in walkable proximity to these highly-coveted amenities. The sheer location in these neighborhoods drives the price of the small-housing. Owing to the differential pricing mechanism discussed earlier, the small-housing development in these neighborhoods demand some of the most exorbitant rental values. As co-living becomes popular as a trend, the landlords, demand even higher rents in return for basic and relatively less expensive services. In such a case, individuals ready to give up space to live in a prime location are pressed even more, making the whole concept even more expensive, and exclusive to only a certain class. The inclusionary housing measures currently cater for the spaces being available to persons earning around 70 percent of the Area Median Income (AMI), however, the units would remain unapproachable to those earning more than the Extremely-Low-Income, Very-Low-Income, or Low-Income categories but not enough to afford the market rate rents.

Inferences

From the above discussions, it could be inferred that the development of small-housing is affected predominantly by the control regulations that define what should be built, where it should be located, and for whom it could be built. These regulations are however, built on several factors stated below. These factors limit the development of the small-housing units, even if the blanket of regulations were to be lifted.

- a) The current and potential renters of small-housing choose the unit type not as a preferred solution for a long-term living, but rather choose it to reduce their rental costs and living in a well-connected neighborhood in exchange for the square footage in their apartment. With a higher-income source, these individuals would promptly vacate these units. As they invest lesser time in the apartment, the feeling of belonging is limited, and hence these individuals choose not to invest more in the neighborhood. So, for these high-consuming neighbors, the relative cost of neighborhood investment in terms of time, money and energy is substantially low.
- b) Until a stable transit or commuting facility is established that caters to every possible trip, the need for private vehicles would be felt, and parking must be provided to accommodate them. Hence, parking space requirements could only be strategically reduced, but not removed completely.
- c) For all the reasons mentioned above, there is an incident market uncertainty that is ascertained by the private financial institutes and lenders as risk factors, making them awry of investing in properties with a higher proportion of small housing units.

- d) The lack of flexibility in the planning of small-housing, and the fact that it cannot be converted to conventional unit-types in a cost-effective manner, make it a rather rigid typology, that cannot be adapted in crucial times.
- e) As the rented units cannot be checked frequently for the number of occupants actually living in them, it increases the risk of reverting to the situation of overcrowding that sparked health and safety violations in the SROs.
- f) Small-housing is planned primarily to accommodate a growing population of single-adults that are also relatively not in the best of financial situations. The sheer location in high-value neighborhoods, drives up the cost of living in such apartments, even if the absolute size of the apartment is reduced.

The issues are prevalent and well understood by city planning officials and subject experts alike. However, neither the market nor the city agencies would take the first step in solving them. As the proportion of single-adults keeps rising in these cities, an intervention must be made to ensure that fair and affordable housing is provided for all. The above case-studies of cities and the issues raised thereof contain some common elements. However, each of the cities in this thesis are in a different phase of creating strategies and policies to amend their regulations for providing fair and affordable housing for all. The cities are aware of the changing demographics and are incrementally preparing for catering to the shifting population trend. However, as assessing the market demand for small-housing is difficult, cities are not seeing a phenomenal rise in the production of appropriate housing solutions, even after experimenting with relaxing the regulations incrementally in certain parts of the city to allow for small-housing.

With the rapidly changing demography, and a slow growth of housing in general, it is crucial to understand the actual needs, and channelize the development accordingly in these

major cities. If action is not taken soon, then the cities would actually drive an entire generation into choosing to live in room-mate situations as a default, rather than out of choice.

Policy Recommendations

The Furman Center paper (2018) makes policy recommendations for city agencies to relax certain regulations that currently impede the development of small-housing in New York City. The paper also suggests local government bodies to take an active participation in catalyzing the development of first few small-housing projects, and promote its growth through housing subsidies and providing other financial assistance. This is a crucial first step to create the sheer volume of small-units in the near future, and it would go a long way to test the actual demand for small living. However, as concluded above, the issues are not just the regulations but the conditions that make it necessary to regulate in the first place. The following set of best practice measures could help alleviate some the ground issues in entirety or partially, thereby opening up the possibility of completely rescinding certain regulations.

- a) By making a calculated deduction in the density factor, city agencies could facilitate developers to provide a higher proportion of small-housing units than allowed today. While this would allow for a speedy construction of these units, there would also be an incident production of other unit types. As households change, they could re-locate in the same community. Furthermore, allowing for convertible units that could be sub-divided or joined to create an appropriate living condition would help the citizens to age in place. As has been championed by Matthias Hollwich (Hollwich, 2016), these transformable units provide for more than one solution. It facilitates both home-owners and renters to live cost-effectively or lavishly as possible. Once people start living in neighborhoods for longer, they would

obviously invest more, thereby becoming a part of the community, rather than being opposed by it.

- b) As cities and entire communities are moving toward transit and better modes of commuting, parking provisions must never be a hindrance for planning long-term strategies for city planning. With newer business models being created to foster in a shared economy, and having technology at disposal, city planning agencies could propel their missions rapidly. The town of Summit (NJ) fostered an agreement with a car-sharing platform (Uber) to subsidize rides on the shared car (King, 2016). This eliminates the need for providing parking, especially when people can get around the whole city cost-effectively with a few clicks on their hand-held devices. While the city pays the difference to the car-sharing platform, it also saves a lot on creating and maintaining parking spaces that could be utilized for better purposes. As autonomous vehicles are being developed, it is important to preserve our spaces today, rather than allotting them to parking facilities, which are not only expensive to build, but are also an aesthetic eyesore.
- c) With convertible spaces and reduced parking requirement, the development of adaptable small-housing would not only be less expensive, but also relatively less risky on the market. As financial institutions and private lenders would then be interested in funding these units, they should be further incentivized to promote small developers. This would allow for more production at a competitive cost price, thereby allowing for meeting the housing shortage sooner. Creating more affordable units, would also allow larger families to rent appropriate sized units, thereby minimizing the need for checking the occupancy limits.
- d) Solving the issues of community investment, commuting options, and construction costs, developing small-housing units in communities further from the core-city could help create

an even more affordable market-rate housing stock in the typology. The city must aim at creating vibrant mix-use communities such that each neighborhood has the facilities within a relative walking distance. These would allow for the government to step back from actively subsidizing affordable-housing programs.

- e) Finally, working together with designers, engineers, and policy makers, city agencies could devise a guiding set of robust principles that would define the health and safety measures for a small-housing project, rather than mandating an absolute size restriction.

While, small-housing is only one among the many cost-effective ways cities can fulfill the ever-increasing demand for housing, it alone cannot be made to bear the task of creating harmonious communities. City agencies must work in tandem to create better neighborhoods that could then host these small-housing units in a sustainable manner. Even if the demand for small-housing turns out to be only a passing trend, in essence, the cities need to allow for an array of housing options to respond to the housing needs and changing demands.

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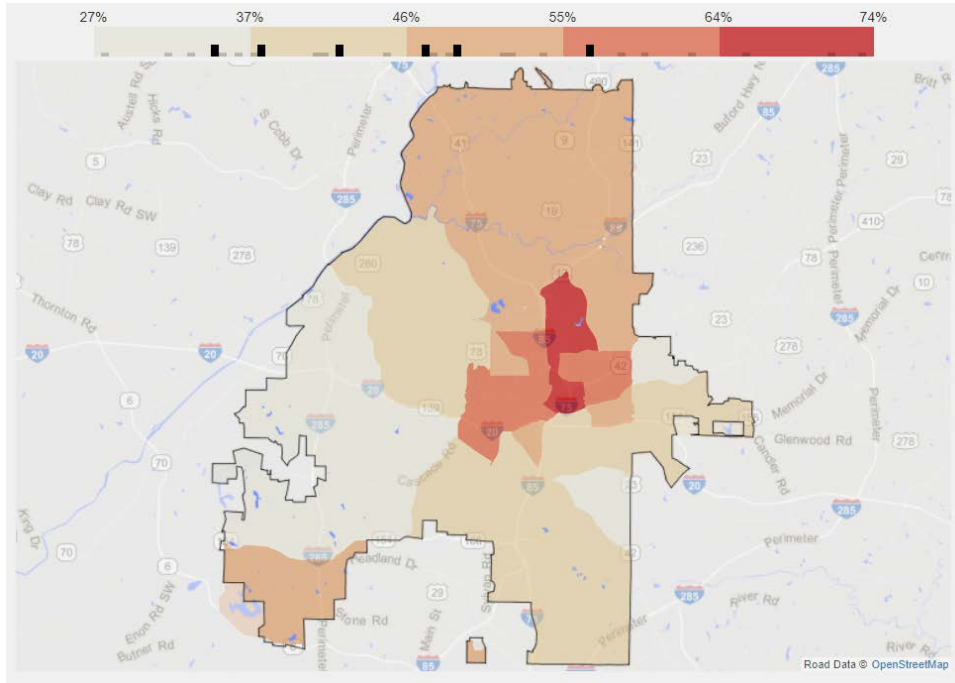
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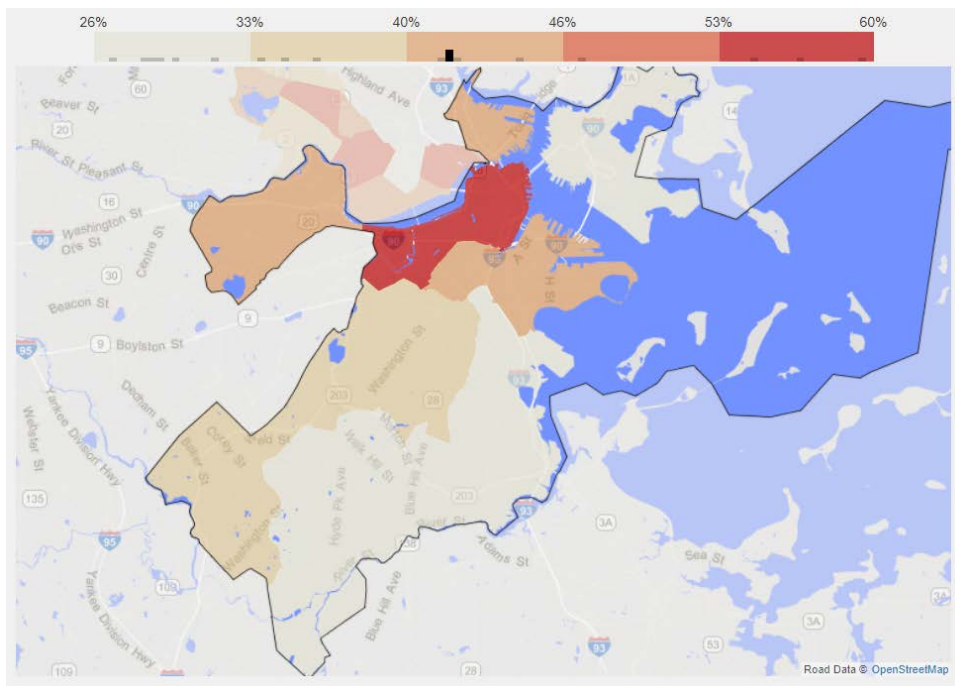
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Appendix 1.1 – Proportion of single-adults in city core regions



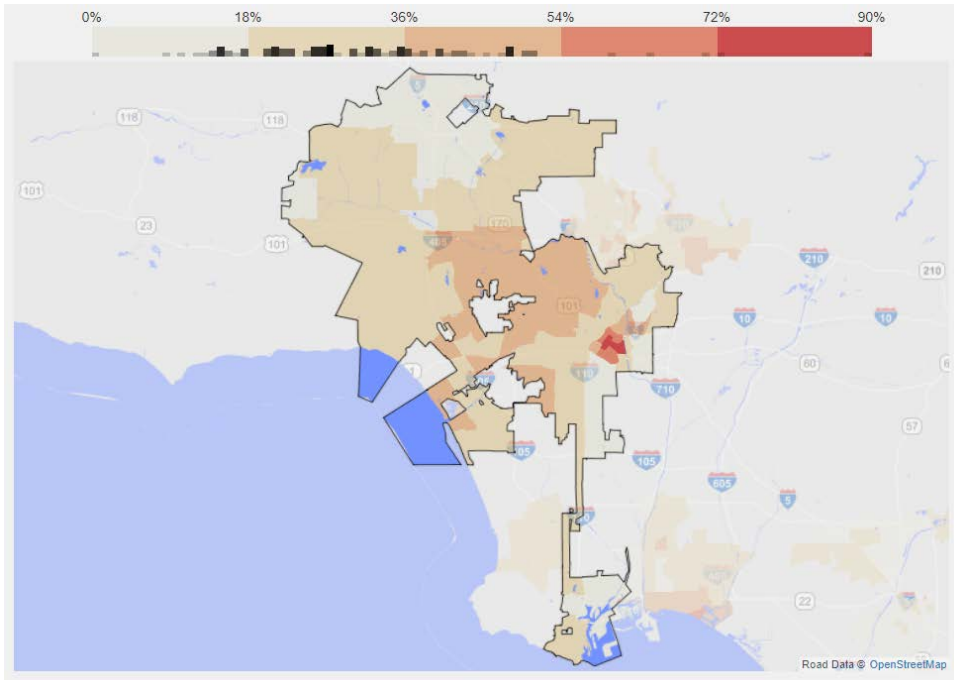
Atlanta

source: <https://statisticalatlas.com/place/Georgia/Atlanta/Household-Types>



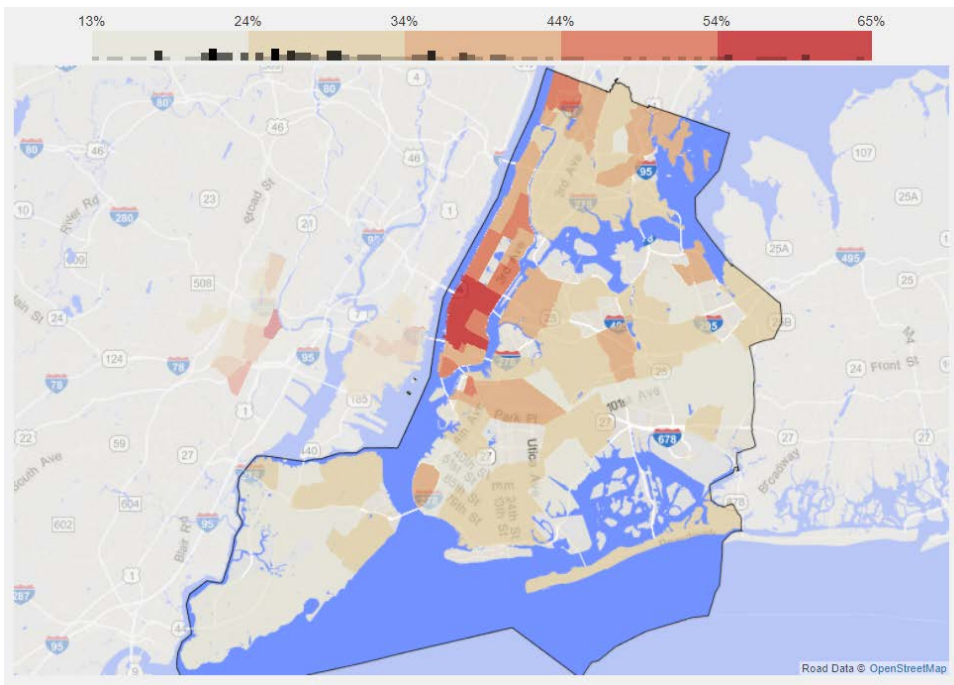
Boston

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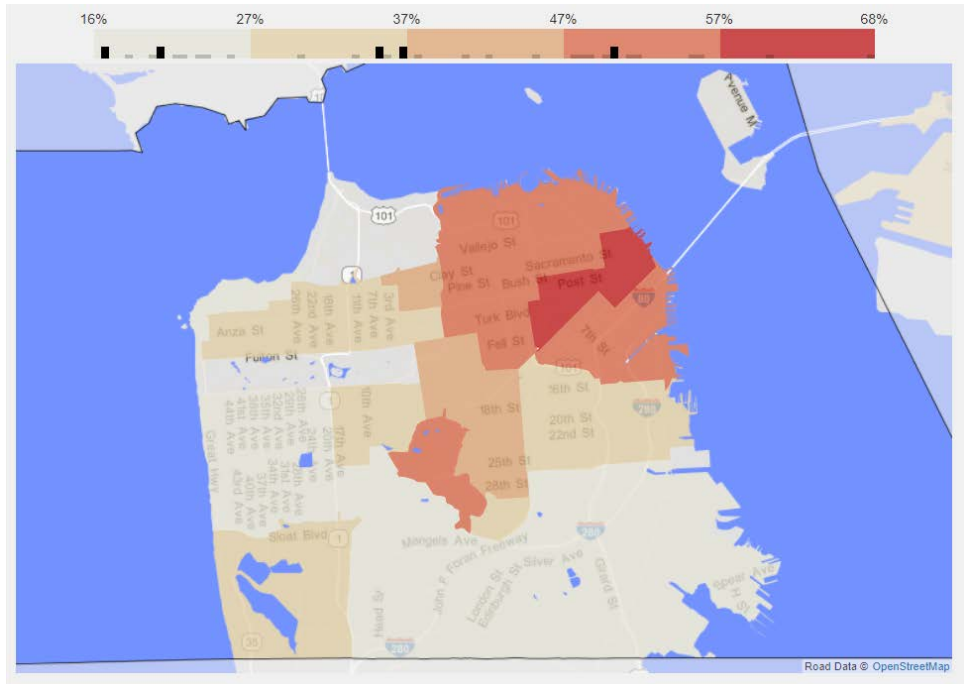
Los Angeles

source: <https://statisticalatlas.com/place/California/Los-Angeles/Household-Types>



New York

source: <https://statisticalatlas.com/place/New-York/New-York/Household-Types>



San Francisco
 source: <https://statisticalatlas.com/place/California/San-Francisco/Household-Types>

As can be observed from above, some of the most expensive neighborhoods (Trulia, 2017) in the select cities are also the ones that are occupied by a high number of single-person households.

Table.3 – Top Quintile neighborhoods with highest percentage of single-person households

City	Neighborhoods with top-quintile percentage of single-person households
Atlanta	Midtown (65.7%), Five-points (71.4%), Sweet Auburn (73.4%)
Boston	Central (54.6%), Back Bay-Beacon Hill (56.6%), Fenway-Kenmore (59.3%)
Los Angeles	Downtown (72.7%), Wholesale District - Skidrow (89.4%)
New York City	Midtown (64.4%), N.Sutton (55%), Clinton (60.3%), Murray Hill (58.7%), Garment District (54.6%), Chelsea (57.5%), West Village (60.2%), Greenwich Village (58.4%), East Village (54.5%), Soho (57.1%)
San Francisco	Financial District (60.3%), Downtown (67.3%)

Source: <https://statisticalatlas.com/>

Glossary of definitions

Density Bonus: To foster equity, or to preserve open spaces, sometimes city agencies introduce certain mandates on developers that may adversely affect the sale revenue from the development. Hence to offset the loss, the local government allows the developer to build more than the as-of-right development capacity in the underlying zoning (Fox & Davis, 1976).

High-demand markets: Large cities with a rapidly growing population base often struggle to keep up with the housing demands. For a stable housing market, the city must have a housing vacancy rate of about five to seven percent (Kasulis, 2016). The housing vacancy in high-demand markets is often below that ideal mark, causing a relative deficit in the demand-supply chain, thereby driving the costs of real-estate to be higher than usual.

Kitchenette: A limited kitchen with facilities just enough to heat food, or boil water. These units are fitted with small electronic appliances and could include an electric kettle and/ or a microwave, and a small fridge, but usually not an oven or a stove.

Murphy Beds: Retractable beds that can be collapsed into a sofa when not in use. Using hydraulic techniques, the configuration could be changed with little efforts by just a single person.

NIMBYism: Acronym for ‘Not in My Back Yard’. The term is most often used to describe an ongoing opposition of certain advocacy groups to land development. The apparent opposition of some activists to every instance of proposed development suggests that they seek a complete absence of new growth, especially in their proximity (Herszenhorn, 2000).

Rent-burdened households: If household pays more than 30 percent of its total income on paying for housing costs including the rent and utilities, then it is supposed to be rent burdened (HUD).

Shared Amenities: Amenities that are not dedicated for an exclusive use by a tenant and located in common areas are called shared amenities. Buildings with conventional units also have such amenities in terms of the shared laundry facilities. However, more specifically, apartments with limited spaces within units have additional spaces for daily functions such as using the bathing facilities, cooking, congregation, and recreation. They are open for all in the community and shared equally. The maintenance and upkeep of these spaces is usually paid for by a certain proportion from the collective amount of the rents of each unit.