

SmartSpace™: Opportunities for a New Real Estate Product

by

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**Submitted to the Center for Real Estate in Partial Fulfillment of the Requirements for the
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ABSTRACT

SmartSpace™, or “S2” for short, is a super-efficient, super-cool, super-small studio apartment with many built-in features designed to be built in very high density, prime, city locations. This thesis has two main objectives: 1) explore the design of SmartSpace™ and recommend changes so that it will better fit the needs of its users; and 2) identify target markets and locations for S2 development.

To achieve the first objective, I stayed in an S2 prototype unit for five days and five nights to get the full SmartSpace™ experience. During my stay, I surveyed 14 graduate students and young professionals to collect their feedback regarding the design of the unit. My S2 experience was generally positive, but the unit felt more like a hotel than an apartment. To live there for a year or more, I recommended among other things, a larger, more functional kitchen, a redesigned bathroom/shower, and a bigger closet. Survey participants had similar and additional detailed feedback. The suggestions were reported to the developer and architect working on S2 so the improvements can be made.

To achieve the second objective: 1) historical trends and precedents of small living space were studied; 2) housing representatives at major universities were interviewed about graduate student housing preferences; 3) patterns were identified in the S2 survey results to make conclusions as to what groups of people will most likely be interested in living in S2; and 4) a methodology was created utilizing demographic and rental data to find the most appropriate locations for S2 development. Finally, the site where the first S2 building will be built was examined and assessed using the same criteria as those used in the site-selection methodology.

The identified users are: graduate students, workers on temporary assignments (interns, traveling nurses, consultants, etc.), and recent movers. The locations found to be best for S2 development are: Financial District, Gramercy, Greenwich Village, and Midtown in Manhattan; Pacific Heights and Western Addition in San Francisco. The development site in Berkeley was found to be a fair location.

Thesis Supervisor: Dennis Frenchman

Title: Professor, Department of Urban Studies and Planning

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CHAPTER 1: INTRODUCTION

In the last five years, I have been an intern, a college student, a full-time employee, a graduate student, and an extern, in four different states, and seven different cities. Far from being unusual, my short-term residencies are becoming more and more typical among young single individuals chasing the best opportunities for their education and careers. Along the way, I have had some interesting and varied living experiences. They include living on the wrong side of the tracks of Stamford, Connecticut because I did not have time to see the place before signing the lease, and having a nice 800+ s.f. loft to myself because it was the smallest unit available in the area I wanted to live. What I tended to look for was a small yet fully self-sufficient unit, ideally furnished, within walking distance from work or school. Yet, it seems that this type of product does not exist in many places.

SmartSpace™ intrigued me because it is a product that would have met my needs. Designed to be built in very high density, prime, city locations, SmartSpace™, or “S2” for short, is a super-efficient, super-cool, super-small studio apartment with many built-in features that make it “smart.” For example, it has a table that converts to a bench or a bed, and a bathroom in which the shower area is part of the bathroom floor. These features are designed to not only make the best use of space, but also to give the units a hip feel. S2 would have been ideal for me when I started my first full time job or when I had a one-month externship in San Francisco.

1.1 Background

The concept of SmartSpace™ was developed by Patrick Kennedy, an MIT Center of Real Estate alumnus who is the founder and president of Panoramic Interests (“Panoramic”), a Berkeley, California-based real estate development company specializing in mid-rise, mixed-use infill housing. The small-and-efficient concept has been introduced in related product categories and has achieved significant success, especially outside of the United States, but much of the housing/hospitality products are conventional and the needs of some users are not addressed. S2 is different from existing products such as SROs and extended stay hotel suites in that it is smaller (about 250 square feet) and more highly designed as to actual function and uses. At the same time, it is less expensive on a per unit basis than larger-sized conventional apartments or corporate housing. Also, although S2 has a similar concept as the Yotel in Europe and the Pod Hotel in New York City, it is much more livable than either of them. Therefore, S2 is a highly innovative, space-efficient product that could work for a short-term stay or permanent residence, depending on the needs of the user.

1.2 Objectives & Methodology

This thesis has two main objectives: 1) explore the design of SmartSpace™ and recommend changes so that it will better fit the needs of its users; and 2) identify target markets and locations for S2 development. To achieve the first objective, I stayed in an S2 prototype unit for five days and five nights to get the full SmartSpace™ experience. During my stay, I surveyed 14 graduate students and young professionals to collect their feedback regarding the design of the unit. I then reflected on my experience and analyzed the survey results to make recommendations for design improvements. To achieve the second objective: 1) historical trends and precedents of small living space were studied; 2) housing representatives at major

universities were interviewed about graduate student housing preferences; 3) patterns were identified in the S2 survey results to make conclusions as to what groups of people will most likely be interested in living in S2; and 4) a methodology was created utilizing demographic and rental data to find the most appropriate locations for S2 development. Finally, the site where the first S2 building will be built is examined and assessed using the same criteria as those used in the site-selection methodology.

CHAPTER 2: PRODUCT DESCRIPTION

This chapter is a detailed description of SmartSpace™, complete with illustrations, renderings, floor plans, and photographs. There is a fully functional prototype unit already constructed and located within the UC Storage facility at 2721 Shattuck Ave., Berkeley, CA. Panoramic Interests is currently working with ZETA Communities (“ZETA”) to build the first S2 building at 2711 Shattuck Ave., which is directly adjacent to UC Storage. In this chapter, both the already-constructed prototype unit and the S2 building in development will be described. Also included is a summary of my five-day, five-night experience living in the prototype unit.

2.1 Location & Site Context

SmartSpace™ is designed to be built in very high-density, prime, city locations—Harvard Square, San Francisco North Beach, New York City, Santa Monica, etc.—where people are willing to live in a smaller space to be in a central location. Favorable characteristics for location/site selection include high number of single households, highly educated population, high rents, and proximity to public transit and workplaces. These and other factors and the reasons behind them are discussed in detail in *Chapter 5: Locations, Sites, and Building Types*. Panoramic Interests is currently looking to build the first S2 building at 2711 Shattuck Ave. in Berkeley, California. A description and evaluation of the site is also contained in Chapter 5.

2.2 Construction Process

Panoramic Interests is currently working with ZETA Communities (“ZETA”) to have the S2 units manufactured, and then assembled into a building. ZETA is a producer of net zero energy, multi-family housing, mixed use and community facilities for urban and sustainable communications. The units will be manufactured in ZETA’s factory in San Leandro, CA. Patrick Kennedy selected ZETA as the architect for S2 not only because of the cost effectiveness of building the units in a factory instead of on site, but also because of ZETA’s ability to build five units a day¹ under high quality control. Another important reason that ZETA was selected is that it will build S2 to LEED Platinum standards, which would make S2 the first for-rent residential building in the nation to achieve this status.² Details related to S2’s environmental features are described in *2.6 Environmental Features*.

2.3 Building

Figure 2.3.1 shows the measurements for a four-story, 30-unit building and Figure 2.3.2 shows possible exterior façades for a four-story S2 building:

¹ Patrick Kennedy, conversation with author, via phone, 4 June 2009.

² Patrick Kennedy, conversation with author, Berkeley, CA, 25 June 2009.

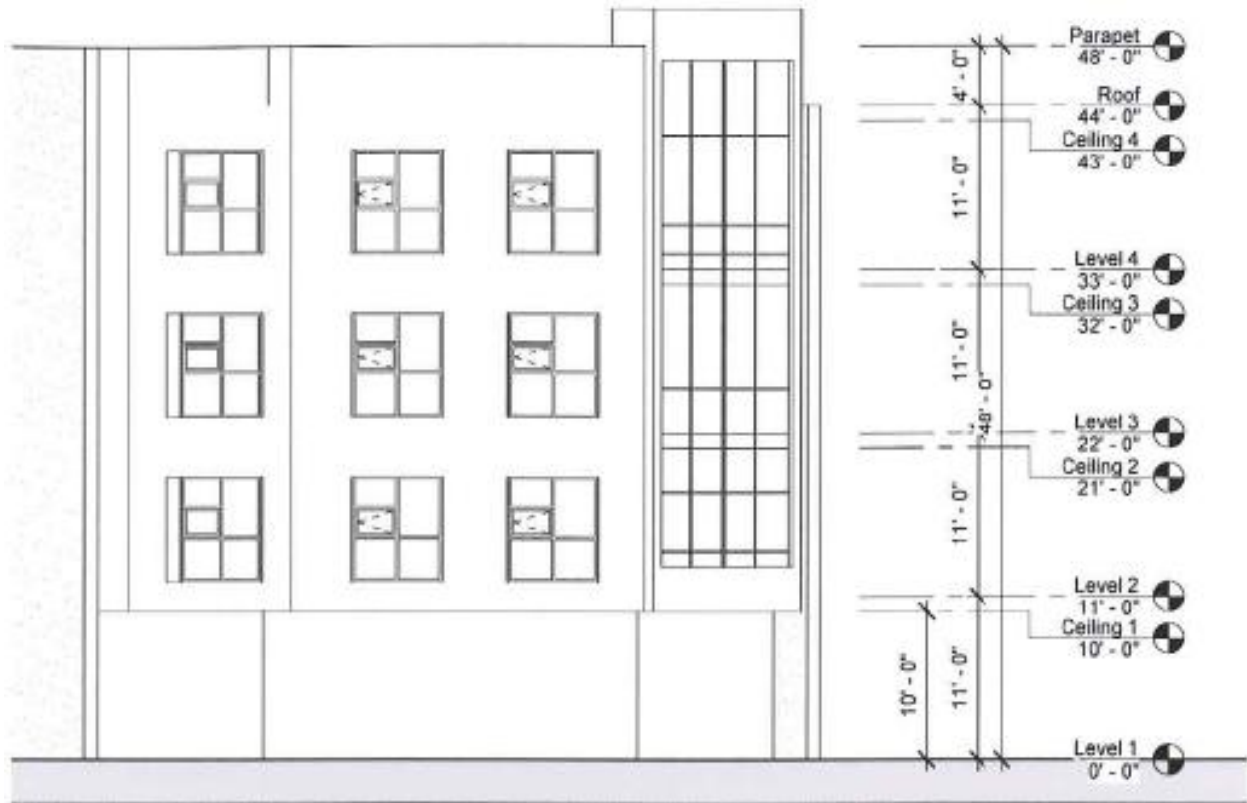


Figure 2.3.1 Building Measurements

©2009 ZETA Communities



Figure 2.3.2 Possible Building Exterior Façades

©2009 ZETA Communities

Currently, only ground-up new construction is explored for S2. Fitting manufactured units into an existing building has not been explored yet due to the complications involved, but it is a possibility in the future. Also, only the low-rise version of an S2 building has been studied at this point, although a high-rise version is possible in the future as well. **5.4 Building Types** discusses building types in detail. Some features of the building are listed below:

- Amenities on ground floor—café, deli store, City CarShare/ZipCar
- Laundry room on each floor
- Security operated entry

- Video cameras
- Resident recreation area with grills in the back of the building

Figure 2.3.3 is the first floor plan of the building and Figure 2.3.4 is the second floor plan, which is similar to that of the third and fourth floors. The building does not have elevators. Four of the six units on the first floor are handicap-accessible.

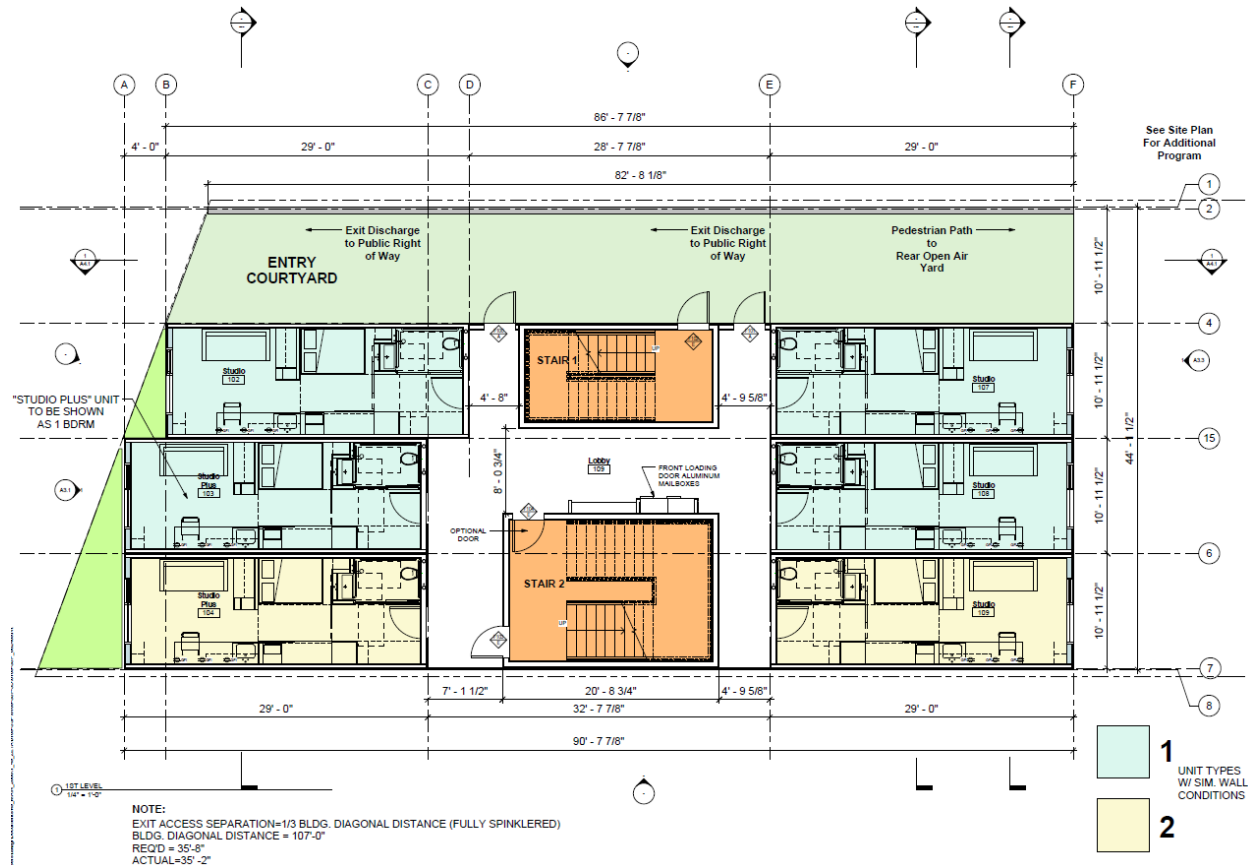


Figure 2.3.3 First Floor Plan

©2009 ZETA Communities

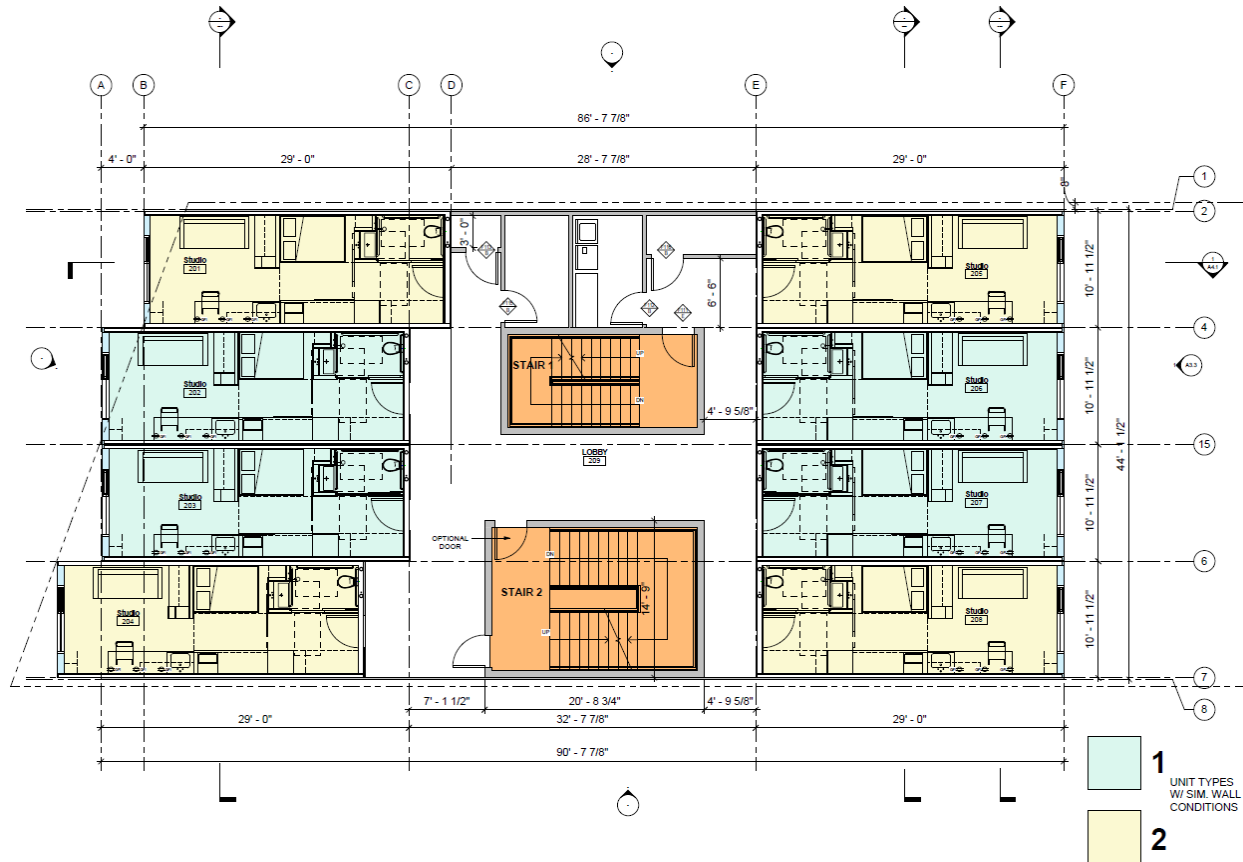


Figure 2.3.4 Second Floor Plan

©2009 ZETA Communities

2.4 S2 Prototype Unit

2.4.1 Unit Overview

To test how “smart” the built-in features are and how SmartSpace™ “feels,” Panoramic Interests constructed a 178 s.f. S2 prototype unit. This unit is purposely built close to California’s legal minimum single occupancy unit size to see how efficiently the space is used. Figure 2.4.1 shows the floor plan:

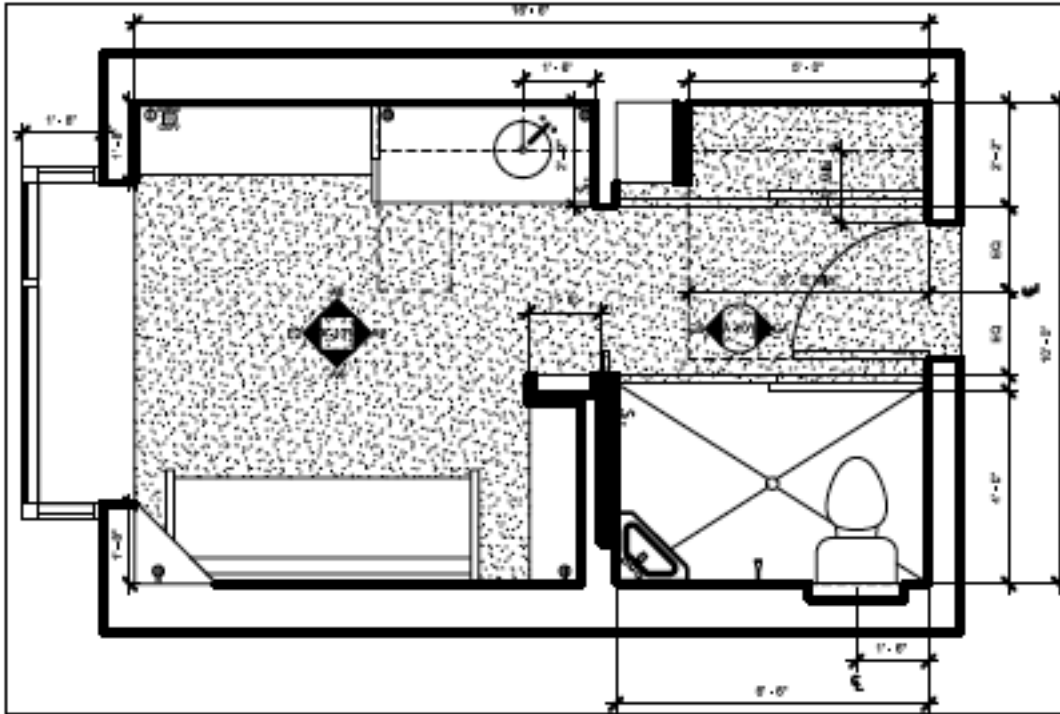


Figure 2.4.1 S2 Prototype Unit Floor Plan

©2009 Panoramic Interests

The floor to ceiling height is approximately 9 feet 6 inches. The material used for the flooring is cork; the material used for the wooden built-in furniture is bamboo. In the floor plan, the window is on the left and SmartBench™ is the structure next to it. Going clockwise: a desk/work station; the kitchen area (the circle is a sink); kitchen appliances area and a closet with sliding doors covering them; additional storage space above this area; the entrance and door; the bathroom with storage space above it; a soundproof sliding door separating the living area from the rest of the unit; built-in shelf space and a secondary desk/computer station adjacent to it; and a convertible couch/bed. Figures 2.4.2 and 2.4.3 are photographs of the unit.



©2009 Panoramic Interests
Figure 2.4.2 Living Area



©2009 Panoramic Interests
Figure 2.4.3 Closet/Bathroom Area

2.4.2 Selected Super-cool, Super-efficient Features

- **SmartBench™:** SmartBench™ is the structure by the window seen in Figure 2.4.2. The middle section can be either lifted (as seen in the photograph) or kept at the same level as the side sections. When lifted, SmartBench™ becomes a table with two chairs; when set down, it becomes a bench or a bed if a cushion is put on it. Also, the hollow spaces beneath the two side sections are used to store stools (as seen in Figure 2.4.2). These stools can in turn be opened up to store things, and can be used as spare guest chairs or footrests.
- **Workstation:** Figure 2.4.4 shows the workstation consisting of a flat panel monitor that can be used as a television or hooked up to a laptop, a desk surface, a pull-out drawer, and bamboo desk drawers. There is also a DVD Player and a surround sound stereo system behind the monitor. An adjustable height chair is also included.



Figure 2.4.4 Workstation

©2009 Panoramic Interests



©2009 Panoramic Interests
Figure 2.4.5 Kitchen



©2009 Panoramic Interests
Figure 2.4.6 Bathroom

- **Kitchen:** Figure 2.4.5 shows the kitchen area. To the right of the sink, the countertop has grooves that allow water to flow to the sink. Beneath the countertop are bamboo drawers. There is an induction stove burner located in the top left drawer in the photograph. A lock on the drawer prevents it from being accidentally shut when the stove is operating. An exhaust fan is located on the upper right corner. The kitchen appliances (a microwave/coffee maker combo, a convection oven, and a half-sized freezer/refrigerator) are to the right of what is shown in the photograph. The overhead bamboo cabinets are narrower than standard size. There is a light beneath them as well as a soap dispenser by the sink.
- **Bathroom:** A sparkly tiled sliding door opens to the size-optimized handicap accessible bathroom, which is shown in Figure 2.4.6. The bathroom features a towel heater, two medicine cabinets behind mirrors, one additional mirror, a dual flush toilet, a shower, two light fixtures, a fan, a small sink, and a floor heater, and a glass shelf. The shower is located in the center of the bathroom, and the floor of the shower area is part of the bathroom floor. Water flows to a drain on the floor. A curtain can be put around the circle seen in Figure 2.4.6 to prevent water from spreading beyond the shower area. If no curtain is there, the entire bathroom becomes a shower when one closes the sliding door.
- **Soundproof Sliding Door:** This door separates the living area from the rest of the unit. This door is helpful for minimizing the noise coming from the heater, refrigerator, or hall when sleeping at night.
- **Secondary Desk/Computer Station:** Figure 2.4.7 shows a narrow desk/computer station in a corner of the living area. This area features built-in book shelves, a panel on which document organizers can be attached or removed, a small tack board on the right wall, desk space and a pull-out keyboard holder, and a set of plastic drawers on wheels. This area utilizes the adjacent convertible couch/bed as a chair.



© 2009 Panoramic Interests
Figure 2.4.7 Secondary Desk/Computer Station



©2009 Panoramic Interests
Figure 2.4.8
Convertible Couch/Bed and “Mirrors”

- **Convertible Couch/Bed and “Mirrors”:** Figure 2.4.8 shows convertible couch/bed, an essential part of the living space. To convert it to a bed: take the cushions off, pull out the front half, and pull the bottom of the upright half so that it becomes flat. There is a narrow built-in shelf next to it that can be used as if it were the surface of a night stand. Mounted on the wall are what look like mirrors, but are actually highly reflective polyester films, known to most as Mylar. This material has the same effect as a mirror, but is safer to use especially in an earthquake prone area like Berkeley.

Other nifty features not mentioned above include surround sound speakers mounted in the ceiling, recessed LED lights with dimmers, a quiet, sleek ceiling fan, and a pull-out hanging device for cleaning devices that come with the unit.

2.4.3 Five-Day, Five-Night Living Experience

To test the livability of S2, I flew to Berkeley and lived in the prototype unit for five days and five nights. During my stay, I kept a journal to record my experiences. It is located in *Appendix A: S2 Prototype Unit Stay—Journal*. Overall, I had a positive experience. I was impressed by the design and the high end furnishing and fixtures. The multi-use furniture was clever and used the space very well. Some other features I liked were the soundproof sliding door, lighting, surround sound, and towel heater. These thoughtful details made the unit feel

luxurious. However, the unit felt more like a hotel than an apartment. To live there for a year or more, I would need at least 50 more square feet of space, a larger, more functional kitchen, a redesigned bathroom/shower, and a bigger closet. Since my stay, I have given my suggested improvements to Panoramic Interests and ZETA Communities as they continue to work on the design for the units in the first S2 building.

2.5 S2 Units in Development

The actual units that Panoramic Interests and ZETA Communities are developing differ from the prototype that I stayed in. Most importantly, the units will be around 250 s.f. instead of 178 s.f. The marginal cost of stretching the units longer is minimal; the additional square footage will just be some additional flooring and closet space. The additional space will be used as a nook. The nook will be able to fit a full size bed on one side; the other side can be used as closet/storage space. There are some other major changes, many of which are in response to the feedback collected from my living experience in the prototype and the survey I conducted, described in detail in *Chapter 4: Target Markets*. Figure 2.5.1 illustrates a tentative floor plan for the new S2 unit:

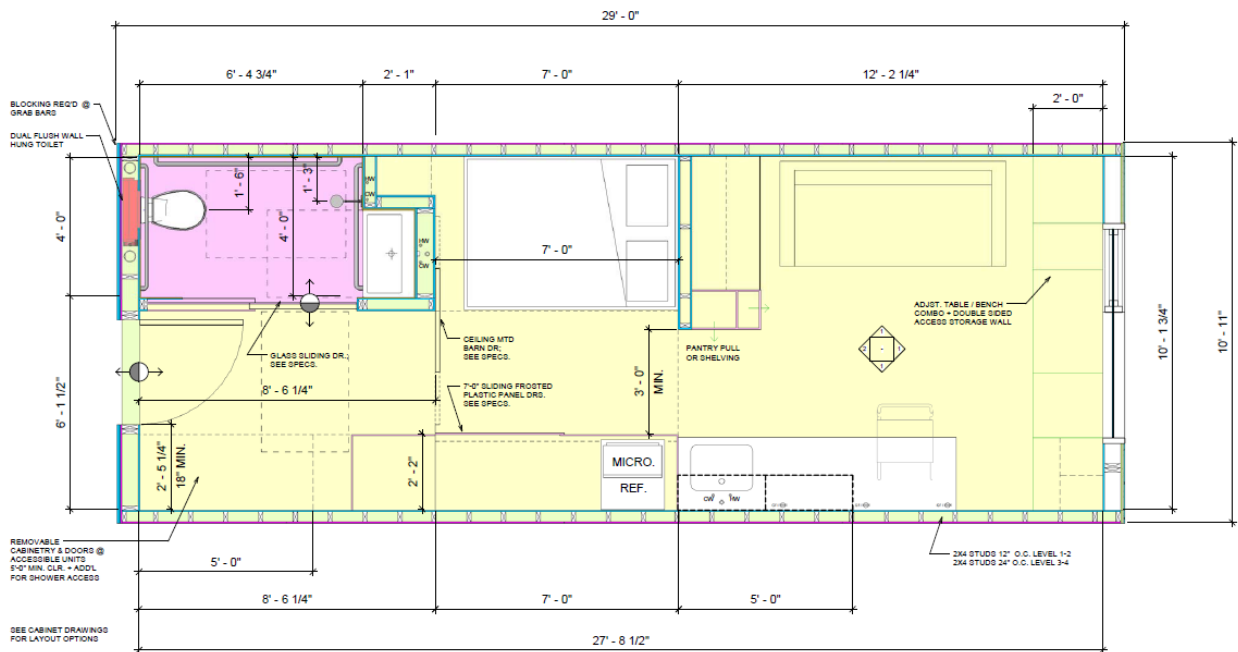


Figure 2.5.1: Floor Plan of New S2 Units

©2009 ZETA Communities

The significant changes are:

- Kitchen:** The stove will have two burners instead of one, and will be located on the countertop instead of in a drawer. It will be changed from the induction type of stove to an electric flat top stove due to cost reasons. The small circular sink will be replaced with a larger rectangular sink as seen in the plan above. Although the kitchen appliances are located in the nook area in the plan, it is likely that they will be moved to the living area. The overhead cabinets will be changed to standard width. The material that will be used for the countertop has not yet been decided.

- **Bathroom:** The bathroom has been completely redesigned, with the shower located at a corner and a much larger sink. (See Figure 2.5.1) Storage space deeper than that of the current medicine cabinets will also be provided. The dual flush toilet will be of the wall hung type, making it look sleeker than the toilet in the prototype.
- **Pantry:** The current built-in shelf space (shown on the left side of Figure 2.4.2) will likely be changed to be a pantry for the kitchen.
- **Secondary Desk/Computer Station Area:** This area will most likely be changed into a bookshelf and/or a storage area/linen closet.
- **“Mirrors”:** The polyester film panels that look like mirrors will be made removable so residents will be able to redecorate the wall if they wish.

Also of note is that the kitchen and workstation counter space in the living area will likely be stretched longer than what is shown in the Figure 2.5.1. What is shown is the same length as the current counter space in the S2 prototype, but given the additional space in the new 250 s.f. S2 unit, more space is likely to be used as counter space. Additionally, tenants will be able to monitor their own energy use over the Internet at any time.³

2.6 Environmental Features

Environmental features of S2 include:

- Car-free design (Nearby, limited parking & City CarShare available)
- Sustainable materials (e.g., cork flooring, bamboo furniture)
- Diminished construction footprint
- Diminished energy consumption footprint
- High walkability ratio
- Close to transit
- Real time monitoring of energy use
- No elevators
- No dishwashers
- Dual flush toilet

As mentioned earlier, ZETA produces net zero energy homes. ZETA does this by combining advanced energy efficiency technology with grid-tied photovoltaics and other clean energy sources. “Net zero energy” means that over the course of a year, a building’s energy production and occupant consumption of energy nets to zero. Figure 2.6 shows the energy consumption/production of a ZETA home compared to the average U.S. home, a Title 24 home, and a LEED certified home:⁴

³ “Patience, Persistence and a Thick Skin,” October 2008 ,
<http://sap.mit.edu/resources/portfolio/patience_persistence/> (24 July 2009).

⁴ Zeta Communities, <<http://www.zetacommunities.com/homes.html>> (24 July 2009).

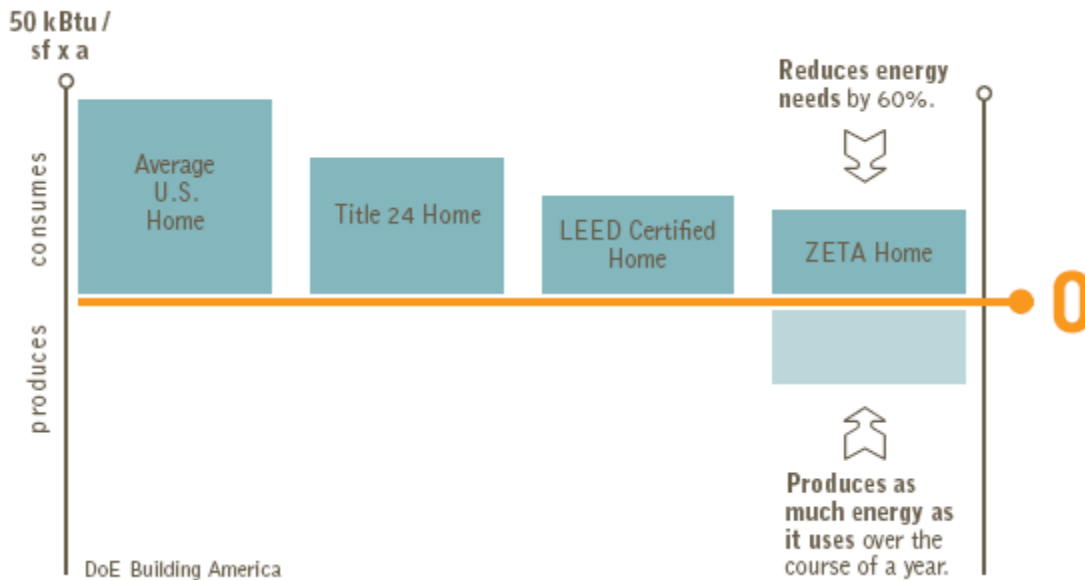


Figure 2.6.1 ZETA Zero Energy Graph⁵

Due to ZETA’s unique methods, it will be able to build S2 to LEED Platinum standards. S2 would be the first rental residential building in the United States to achieve this status.⁶

2.7 Financial Feasibility

It is expected that the hard, soft, and FFE costs for the first S2 building, including the cost of the exterior façade and the common spaces/amenities, will be approximately \$125,000/unit, or \$3.75 million total. Additionally, fees are expected to be around \$150,000 and the land cost is \$200,000. Panoramic Interests expects to fund the project with a 50% Loan To Value (LTV) loan and contribute \$500,000 to the deal. The rest will be funded with money from an equity partner, who Panoramic Interests expects to demand a return of 8%.⁷ Figure 2.7 is a simple pro forma based on the aforementioned numbers, a loan interest rate of 6%⁸, a monthly rent of \$1,150 per unit⁹, a vacancy rate of 4%¹⁰, an expense ratio of 30%¹¹, an ad valorem tax rate of 1.2304%¹², an annual Special Assessment Tax of \$10,600¹³, and a valuation cap rate of 6%.¹⁴

⁵ Ibid.

⁶ Kennedy, conversation, 25 June 2009.

⁷ Patrick Kennedy, “RE: Flight Receipt; A Few Questions” 16 July 2009, office communication (24 July 2009).

⁸ Patricia Trinidad, “Supply Threats Emerging in Downtown Oakland,” *Apartment Research Market Update*, Second Quarter 2009, <<http://www.marcusmillichap.com/research/reports/Apartment/oaklandapt.pdf>> (24 July 2009).

⁹ Kennedy, conversation, 25 June 2009.

¹⁰ Zilpy LLC, “Zipcode 94705 Apartments & Houses Rent Comparison, Neighborhood Rent Maps,” <http://www.zilpy.com/US/California/Alameda_County/Berkeley/Zipcode_94705/> (24 July 2009)

¹¹ Kennedy, “RE: Flight Receipt; A Few Questions.”

¹² City of Berkeley Finance Department, “Annual Real Property Tax Statements,” <<http://www.ci.berkeley.ca.us/ContentDisplay.aspx?id=6280#PropertyTaxAssessments&Fees>> (24 July 2009).

¹³ Calculated from figures on above website.

¹⁴ Trinidad

Build Costs		Income & Expenses	
Hard + Soft + FFE	\$3,750,000	Rent/unit/mo.	\$1,150
Fees (Cont., Dev.)	\$150,000	Units	30
Total Cost	\$3,900,000	Rent/mo.	\$34,500
		Less Vacancy @ 4%	(\$1,380)
Total Building Costs	\$3,900,000	Revenues/mo.	\$33,120
Land	\$200,000	Total Annual Revenues	\$397,440
Total Dev. Cost	\$4,100,000	Less Expenses @ 30%	(\$119,232)
		Net Operating Income	\$278,208
Funding			
Panoramic Interests Equity - 12%	\$500,000	Less Ad Valorem Tax @ 1.2304%	(\$51,726)
Equity Partner - 38%	\$1,550,000	Less Special Assessment Tax	(\$10,600)
Loan - 50%	\$2,050,000		
Loan Rate	6.0%	Income After Tax	\$215,882
Equity Partner Return	8.0%	Less Loan Interest	(\$123,000)
		Less Return to Equity Partner	(\$124,000)
Valuation @ 6% Cap Rate	\$4,636,800		
		Net Income	(\$31,118)
Returns			
Panoramic Interests Cash on Cash	-6.22%		
Value Created	\$536,800		

Figure 2.7.1 Financial Pro Forma

Although the value created is positive, the proposed funding structure results in negative net income and a negative Cash on Cash return for Panoramic Interests. This result is largely due to current conditions in the lending market. Whereas multifamily developers were able to obtain LTVs of up to 80% in the past, LTVs for multi-family loans are now in the 55-75% range.¹⁵ Given that S2 is a new product with considerable risk, lenders will likely require an LTV in the lower end of the 55%-75% range. Panoramic Interests is proposing 50% LTV, which is reasonable and conservative. It is recommended that Panoramic Interests look into alternative ways of financing. For example, if some of the units are made affordable, Panoramic may be able to obtain low income housing tax credits. Furthermore, due to the green building nature of the project, there might be opportunities to apply for federal stimulus money. The financial feasibility of the deal is thus contingent on finding more favorable financing terms.

¹⁵ Trinidad

CHAPTER 3: TRENDS AND PRECEDENTS

As SmartSpace™ relies on the concept of small space living in convenient locations, it is helpful to view this concept in a larger context. How have American city dwellers' living preferences changed over the years and do they warrant the production of small and efficient living spaces in prime city locations? What are some products that were developed using this concept and how have they fared in the market? What kind of business models work for small units? This chapter attempts to answer these questions by: 1) using New York City as an example to illustrate the historical shrinkage in apartment sizes in a major America urban center; and 2) studying four products that have been developed using the small-and-efficient concept.

The first section describes the trend towards smaller apartments in New York City apartments, the reasons behind this trend, and their applicability to S2. The second section examines the design and market performance of four products that were built based on a similar concept as S2: a UC Berkeley single graduate student residence, a Manhattan hotel, a European hotel chain, a San Francisco for-sale condominium building. The chapter concludes with lessons learned from this study of precedents.

Some conclusions that are made in this chapter are:

- People are generally receptive to sacrificing space for convenience and affordability.
- Certain subgroups of people are more willing to accept smaller space than others.
- Small studios perform better when they are meant to be hotels or rentals rather than for-sale condominiums, indicating people's view of them as a temporary residence rather than a permanent one.

3.1 Trend towards Smaller Apartments in New York City

Apartment living in New York City evolved significantly in the 20th century. Apartments built prior to World War II, known as pre-war apartments, focused on architectural detail and high living standards, having features such as higher ceilings, larger rooms, and detailed moldings and fixtures. In contrast, post-war apartments focused on shared amenities and structural flexibility. Although they lacked the charm and detailing that characterize pre-war apartments, they were more efficient and practical. The difference between these two styles is representative of the general trend towards smaller, more efficient space and more economic housing construction.

By the 1980's, apartments were notably smaller and more expensive than the ones produced before World War II. They had also shrunk about 10 to 20 percent from the dimensions of the 1970's. The shrinking apartment sizes were largely due to rising land and construction costs. For instance, by the 1980's, the cost of land was 20 to 30 times higher than in the 1960's¹⁶, and there were thousands of small (350-500 square feet) apartments in New York.¹⁷ However, economics were not the only drivers affecting apartment sizes. The changing lifestyle of city dwellers was also favoring a smaller unit size. Residents of smaller units embraced them not only because of their affordability, but also because there was less of a need for bigger units.

¹⁶ Anthony DePalma, "Do Small Condos Fit New Life Styles?" *New York Times*, 12 October 1986, p. A.1.

¹⁷ Joseph Giovanni, "Cinderella Transformations: Small Spaces Look Larger." *New York Times*, 20 February 1986, p. C.1.

For instance, as they were spending a lot more time outside their apartments, an extensive kitchen was unnecessary; the modern, more convenient kitchen equipped with a microwave oven and a dishwasher but less cabinet space better served their needs. Therefore, architects viewed how much space they give as less important than what they do with that space.¹⁸

Historical evidence of positive market reception to smaller, more efficient apartments in New York City is favorable for SmartSpace™. If New Yorkers accepted 350 s.f. studios as early as two decades ago, then perhaps it is not too far of a leap to be building 250 s.f. studios in major urban areas today for cost-conscious people with active lifestyles. However, because 250 s.f. is still only a fraction of the average size of existing studios in major American cities¹⁹, it is likely that it will fit the needs of only a subset of city dwellers. Thus, important questions remain for S2: What groups of users will find 250 s.f. of space to be adequate? How small is too small? In which cities will there likely be users for S2? The next two chapters will answer these questions.

3.2 Precedents

3.2.1 Manville Student Apartments

Manville Student Apartments are located at 2100 Channing Way, Berkeley, CA. They were completed in 1993²⁰ for single law and graduate students at UC Berkeley. The UC Berkeley Housing website describes them as the following:

Located three blocks from the southwestern corner of campus at Shattuck Avenue and Channing Way, Manville apartments are within walking distance of downtown Berkeley near shops, banks, movie theatres, restaurants and public transportation.

Reserved for law and graduate students, the secured complex includes:

- 132 small, unfurnished, single-occupancy studio apartments
- Each studio includes a kitchenette, bathroom, built-in bookcase, desk
- Internet data-lines, and cable TV access
- a central courtyard
- Several floor plans with 260 to 305 square feet of living space.
- Some apartments have Bay views; some open onto a central courtyard or have decks.
- Secured entry and elevator.
- The complex has common areas; a lounge, laundry facilities, mail room, and three study rooms.
- Storage spaces and limited parking spaces are available for additional fees.

¹⁸ DePalma, A.1.

¹⁹ According to Zilpy, an online rental market facts and analysis service that collects data from all available sources (newspaper classifieds, online classifieds, apartment rentals, etc.), the average sizes for studio apartments in some of the major American cities are the following: New York City—630 s.f.; Los Angeles—649 s.f.; Chicago—550 s.f.

²⁰ Jienan Han, “House, Home, and Community: Good Models for Graduate Student Housing” (Master thesis, Massachusetts Institute of Technology, 2004), 48.

- Access to Unit 3 computing center and technical assistance.²¹

Figure 3.2.1 is the floor plan of a standard studio, showing that the kitchenette, closet, and built-in desk are built against the walls to create an unobstructed living space.



Figure 3.2.1 Manville Studio Floor Plan

Source: Ibid.

The monthly rent for the 2009-10 school year is \$1,014 for a standard apartment and \$1,048 for an apartment with a bay view, deck, or courtyard access.²² The Manville Apartments has been popular with students—there is normally a waiting list.²³

3.2.2 The Pod Hotel

In 2007, the owners of the Depression-era Pickwick Arms Hotel at 230 East 51st Street in New York City completed gutting the 367-room building²⁴ and updating it to become a 347-room hotel. The diminutive guest rooms come in several smartly executed configurations.²⁵ The room types along with some of their rates and features are listed in Figure 3.2.2:

²¹ UC Regents, “Manville Apartments,” *Living at Cal*, 2009, <<http://www.housing.berkeley.edu/livingatcal/manville.html>> (29 July 2009).

²² Ibid.

²³ UC Berkeley School of Law, “Housing Options,” <<http://www.law.berkeley.edu/433.htm>> (29 July 2009).

²⁴ Holusha, John, “SQUARE FEET: CHECKING IN; Less Space, More Hotel Bells and Whistles,” *New York Times*, 13 July 2005, <<http://query.nytimes.com/gst/fullpage.html?res=980DE7D71530F930A25754C0A9639C8B63>> (27 July 2009).

²⁵ Gary Lee, “NYC’s Pod Hotel: Little Rooms, Big City,” *The Washington Post*, 18 March 2007, <<http://www.washingtonpost.com/wpdyn/content/article/2007/03/16/AR2007031600754.html>> (12 May 2009).

Room Type	Queen	Double	Single	Bunk	Double Double	Townhouse Studio	Veranda Pod
Nightly Rate	\$169	\$139	\$89	\$119	N/A	N/A	N/A
Sleeps Up To	2	2	1	2	4	4	3
Bed Size (Number)	Queen (1)	Double (1)	Twin (1)	Twin (2 Bunked)	Double (2)	Queen (1); Twin (2)	Double (1); Twin (1)
TV Size/Type (Number)	20" LCD (1)	15" LCD (1)	15" LCD (1)	10" LCD (2)	20" LCD (1)	32" Flat screen (1)	20" LCD
Type of Bathroom	Private	Private	Shared	Shared	Private	Private	Private
Storage Drawers	x	x			x	x	x
Closet Type	open	open	open	open	open	walk-in	open
Workspace	x	x	x		x	x	
Personal Reading Lights				x			
Headphones				x			
Stainless Steel Sink	x	x	x		x	x	x
Rain-head Shower	x	x			x	x	x
In-room Display of Shared Bathroom Availability			x	x			
Tub						x	
Hairdryer						x	
Small Accessible Terrace							x

Figure 3.2.2 The Pod Hotel Matrix

Source: <http://www.thepodhotel.com/>

In addition to the above, all rooms have the following features:

- In-room safe
- Dimmer control lighting system
- Mp3 player docking station
- Free WiFi²⁶

Guests can choose a room type and book it on the hotel's Web site or through the reservation desk.²⁷

New York hotel rooms average 275 square feet²⁸, and Pod rooms are on the snuggest end of the spectrum: they average 100 square feet. It's the rates—among the most affordable in New York for lodging of this quality—that give the Pod Hotel its appeal.²⁹ As shown in Figure 3.2.1, double rooms with a private bath are about \$139 a night, plus taxes, and a single with shared

²⁶ <www.thepodhotel.com> (27 July 2009).

²⁷ Lee

²⁸ Eric Marx, "A gym in your hotel room," *The Real Deal Online*, 1 April 2006, <<http://therealdeal.com/newyork/articles/a-gym-in-your-hotel-room>> (27 July 2009).

²⁹ Lee

bath goes for \$89.³⁰ “Prices may fluctuate according to season and demand, front desk manager Lee Schlesinger said, but he added that the Pod aims to remain cheaper than the competition.”³¹ The average cost of a night’s hotel room in Manhattan was \$306 in 2008.³²

The Pod is designed so that the guests can feel hip while still on a budget. “The bright lobby is dominated by an illuminated seafoam reception desk. The guest-room décor is an inviting mix of mod and 1950s retro styles—dotted bedspreads, chrome bathroom fixtures and rain-style showerheads.”³³ Figures 3.2.3 and 3.2.4 illustrate the modern style of the hotel:



Figure 3.2.3 The Pod Hotel Reception Desk

Source: <http://www.thepodhotel.com/>

³⁰ <www.thepodhotel.com> (27 July 2009).

³¹ Lee

³² HVS, “2009 Manhattan Hotel Market Overview: Operating History,” 2009, <<http://www.hvs.com/staticcontent/library/nyu2009/survey/ManOpHist.html>> (27 July 2009).

³³ Lee



Figure 3.2.4 The Pod Hotel Guestroom

Source: <http://www.thepodhotel.com/>

The Pod was conceived with youthful adventurers in mind. Guests tend to be 20-somethings who are visiting Manhattan for the first time, young couples from Europe on a shopping trip, friends from nearby who are in town for a Broadway show, etc.³⁴

The Pod Hotel has been successful so far, especially compared to other more traditional economy hotels. In May 2007, when the hotel market was hot, some hoteliers were saying that budget hotels were not worth investing in Manhattan due to the escalated land and construction costs. Sam Chang, CEO of McSam Hotel, which had built six economy class hotels in the city, did not think anyone could afford to build economy hotels in Manhattan in 2007. He felt that the costs of economy hotels were too high to turn a profit. Developer John Lam of Lam's Group, which finished an economy hotel in January 2007, concurred with Chang's assessment, and added that rooms have to be at least \$200 a night to justify building a new project. The Pod Hotel has rates lower than \$200 a night. Yet, it has been able to profitable and popular because of its smaller sized rooms³⁵, the large number of them, and its branding as a "cool" hotel. It has enjoyed a consistent occupancy rate of 93 percent or higher³⁶, compared with the Manhattan average of 86 percent.³⁷ On a per-square-foot basis, it charges 30 percent more than other economy hotels.³⁸

3.2.3 Yotel

³⁴ Ibid.

³⁵ Lauren Elkies, "Economy Hotels No Bargain for Developers," *The Real Deal Online*, 1 May 2007, <<http://ny.therealdeal.com/articles/economy-hotels-no-bargain-fordevelopers>> (12 May 2009).

³⁶ Nancy J. Friedman Public Relations, *Case Studies*, <http://www.njfr.com/case_Pod_Hotel.html> (28 July 2009).

³⁷ HVS

³⁸ Elkies.

Yotel is a chain of budget hotels launched in 2007 by creator Simon Woodroffe, the man behind Britain’s successful Yo! Sushi restaurant chain.³⁹ Although not quite as diminutive as Japan’s capsule hotels (where capsules are about 3 feet by 4 feet by 6 feet⁴⁰), the hotel crams travelers into 7- to 10-square-meter (75- to 108-square-foot) cabins.⁴¹ Woodroffe says he was inspired after being upgraded to business class while traveling by plane.⁴² Costing roughly \$114 a night⁴³ “(but also bookable for four-hour periods), the rooms are aimed at passengers waiting for connections or those who want to sleep or work before a meeting. The budget hotel concept has already proved a hit in London, with the 2005 launch of easyHotel by no-frills airline pioneer Stelio Haji-Ioannou.” However, while easyHotel cuts costs by stripping away luxuries such as televisions, Yotel squeezes high-end amenities into rooms. Each soundproof cabin contains a bed, a pull down desk, closet space, adjustable mood lightning, a shower, wireless Internet, an iPod connection and a flat-screen TV. Check-in and check-out are automated.⁴⁴ Guests can order food delivered to their rooms from touch screens. Figure 3.2.5 is the floor plan of a standard 7-square-meter (approximately 75-square-foot) Yotel cabin, which shows a wall-mounted TV and a pull up work desk to minimize space usage:

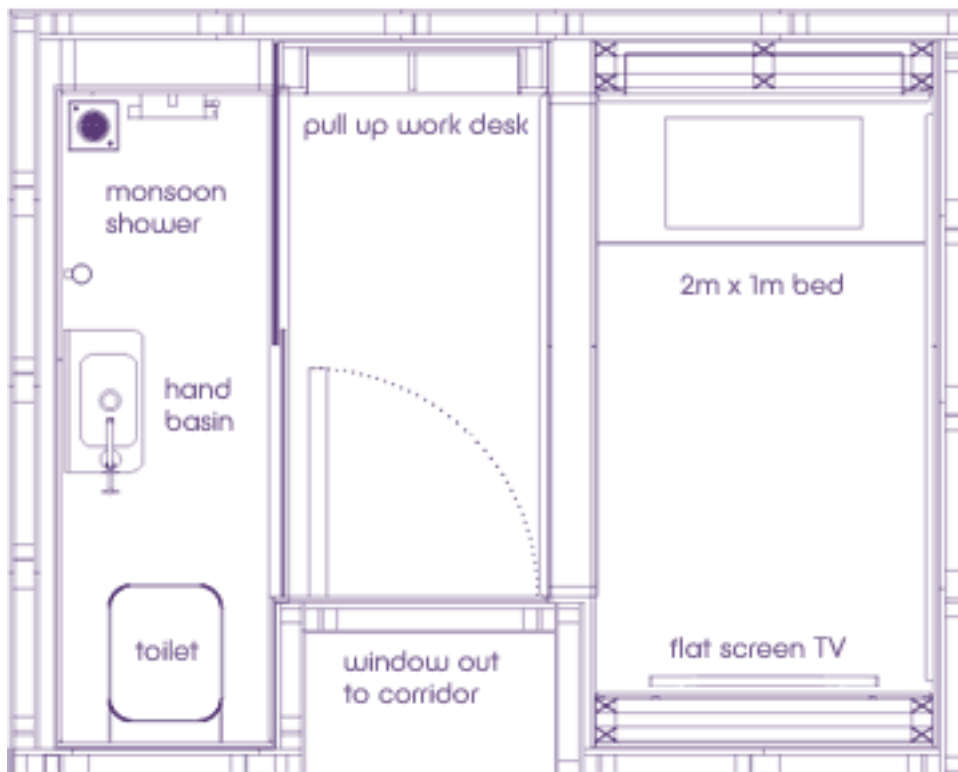


Figure 3.2.5 Yotel Floor Plan

³⁹ “Goodbye mini bar, hello mini room,” *CNN.com*, 29 December 2005, <<http://www.cnn.com/2005/TRAVEL/12/28/budget/hotel/index.html>> (17 June 2009).

⁴⁰ Shizuko Mishima, “Japanese Capsule Hotels,” *About.com: Japan Travel*, <<http://gojapan.about.com/cs/accommodation/a/tokyocapsule1.htm>> (27 July 2009).

⁴¹ YOTEL Limited, “Find out about YOTEL,” 2008, <http://www.yotel.com/find_out.aspx> (27 July 2009).

⁴² “Goodbye mini bar”

⁴³ YOTEL Limited, “Book a cabin,” <<https://www.yotel.com/step1.aspx>> (27 July 2009).

⁴⁴ “Goodbye mini bar”

Source: <http://www.yotel.com/>

Yotel has been a huge success so far.⁴⁵ After its launch in the London Gatwick Airport in June 2007, it was already achieving 120%⁴⁶ occupancy rates by October 2007.⁴⁷ Yotel expanded its reach by opening subsequent divisions in the London Heathrow and Amsterdam Schiphol Airports in December 2007 and October 2008, respectively.^{48,49} As of February 2009, Yotel was enjoying occupancy rates of nearly 200%. According to Arab newspaper Al Bawaba, “YOTEL is the exact opposite to the manic and often stressful airport environment offering guests a haven of calm and quiet with luxury bedding, rejuvenating power showers, relaxing mood lighting, practical work station and WiFi internet. A unique alternative to the plain, airport hotel offering, guests have been quick to embrace the convenient location, funky door, simple booking system (www.yotel.com) and excellent customer service.” In November 2008, YOTEL signed a Memorandum of Understanding with Abu Dhabi National Hotels (ADNH) to develop this revolutionary new hotel concept in the UAE capital. YOTEL is planning to introduce at least two YOTELS, one in the Abu Dhabi International Airport and another in Abu Dhabi City Centre in the near future.⁵⁰

3.2.4 Cubix Yerba Buena

In 2008, San Francisco design and development firm HausBau SF completed⁵¹ 98 tiny condominiums – ranging from 250 to 350 square feet – at the Cubix Yerba Buena (“Cubix”) building in the South of Market (SoMa) neighborhood. Cubix targets young first-time buyers without too much stuff. Architect George Hauser and local planning groups “believe that the so-called micro units represent one means of providing more first-time home-buying opportunities in a city where most prices outstrip most incomes.” The starting prices of the units were \$279,000 to \$330,000. By comparison, the median price for all homes in San Francisco was \$749,000 in July 2008.⁵²

San Francisco Chronicle Staff Writer James Temple summarized Cubix in the following manner:

The asymmetrical modernist façade of the eight-story building at Harrison and Fourth streets, a few steps from Whole Foods, is a Rubik’s Cube of muted reds, browns and tans. Metal-framed windows of varying shapes and sizes break up the blocks of color. The units themselves feel, well, small, but stylish and functional.

⁴⁵ “YOTEL wins Business Hotel of the Year At the Business Travel World Awards 2009,” *AlBawaba.com*, 9 February 2009, ProQuest (17 June 2009).

⁴⁶ Because rooms can be booked at minimum 4-hour increments, they can be booked more than once a day. Multiple bookings per room per day can result in occupancy rates of more than 100%.

⁴⁷ Yotel, “John Graham Checks in as New Construction Director at YOTEL,” 15 October 2007, <https://www.yotel.com/pdfs/15-10-07_New_Director_of_Construction.pdf> (27 July 2009).

⁴⁸ “YOTEL wins Business Hotel of the Year”

⁴⁹ “YOTEL opens in Schiphol Airport, Amsterdam,” *ASIATravelTips.com*, 17 October 2008, <<http://www.asiatraveltips.com/news08/1710-YOTEL.shtml>> (27 July 2009).

⁵⁰ “YOTEL wins Business Hotel of the Year”

⁵¹ HausBau SF, “766 Harrison – June 2008,” <http://www.tbcproperties.com/properties/766_harrison.html> (28 July 2009).

⁵² James Temple, “Home, small home: 250 square feet in SoMa,” *San Francisco Chronicle*, 24 August 2008, <<http://www.sfgate.com/cgi-bin/article.cgi?f=c/a/2008/08/24/BUTM12GQMI.DTL&type=printable>> (17 June 2009).

The kitchen area includes a mini sink, two-burner electric cooktop, half fridge and microwave-convection oven. The appliances are stainless steel; the countertop synthetic brown stone. There isn't room for a bed and a sofa, so each studio is staged with a sofa-bed. They come with a wardrobe but no closets.

The concrete-floored rooms have windows the height of the nearly 9-foot ceilings, and all but two have small balconies, which look out to Harrison or Fourth, or buildings to the east. The bathroom is fairly large, squared off with translucent glass walls and adorned with slate or quartz tile.

Building amenities include a café on the ground floor, with additional retail spaces to be leased, and a community rooftop with glass-enclosed terraces, outdoor tables, drought-resistant plants and a grill.⁵³

Figure 3.2.6 shows the modern façade of the building:

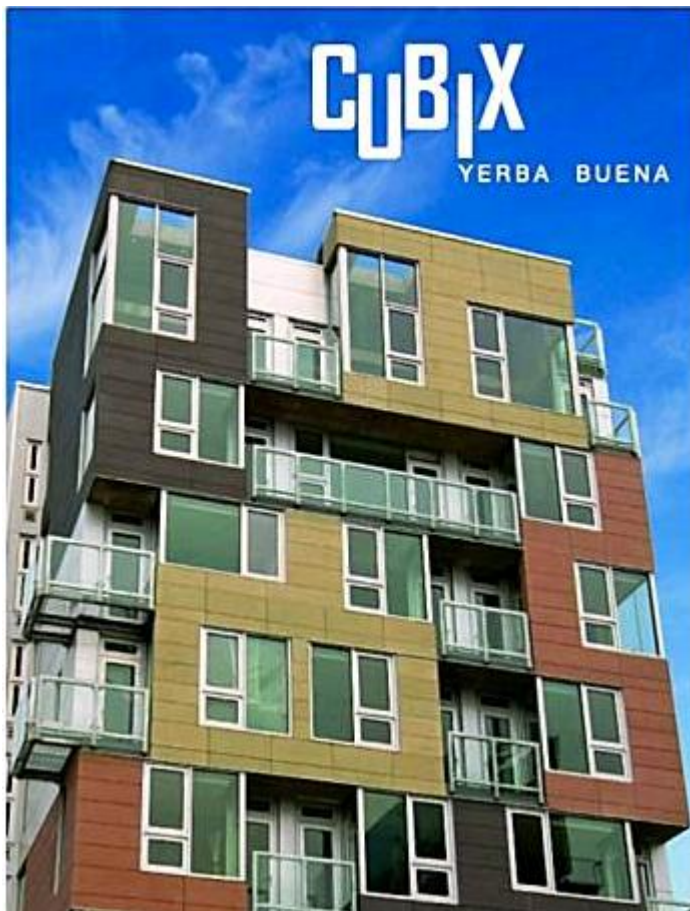


Figure 3.2.6 Cubix Exterior

Source: Ibid.

Figure 3.2.7 shows a typical studio's floor plan and highlights a few of the high end amenities:

⁵³ Ibid.

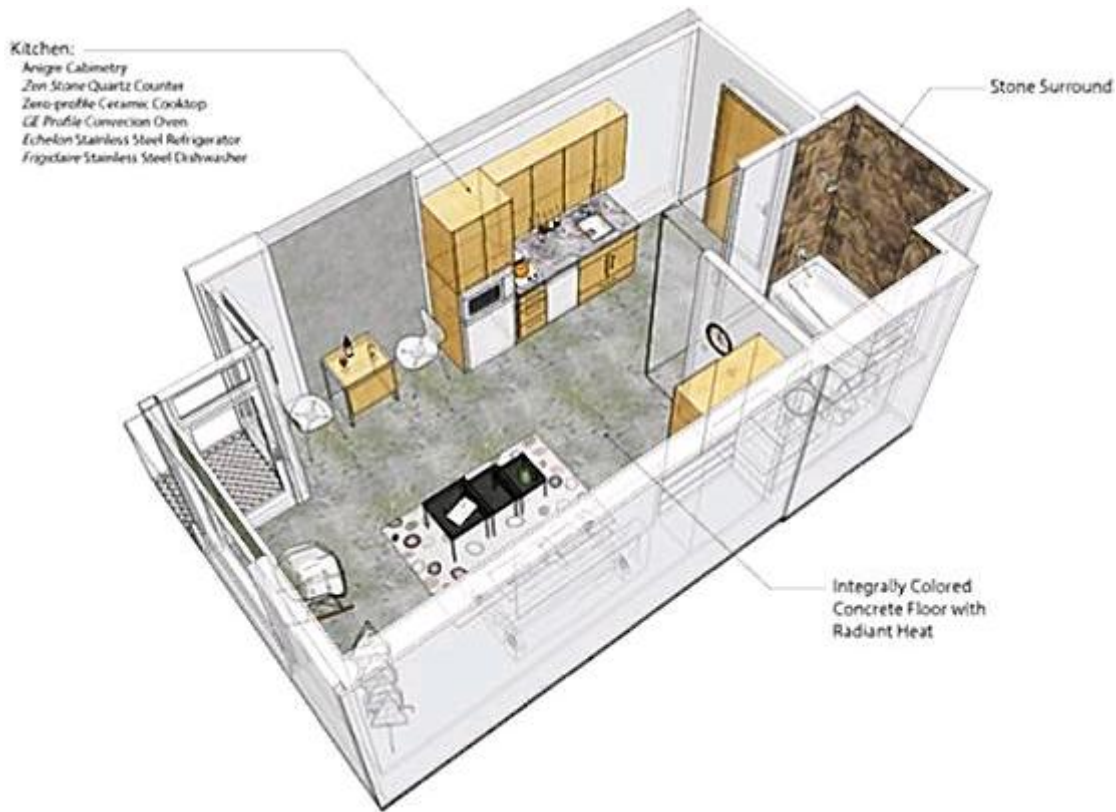


Figure 3.2.7 Cubix Floor Plan

Source: Ibid.

Cubix’s performance in the market has been poor. It had begun marketing its condos by August 2008⁵⁴, and as of March 2009, had sold 35 percent of its units.⁵⁵ This progress was only achieved after holding an “Economic Stimulus Sale” from Inauguration Day (January 20, 2009) to Presidents Day (February 16, 2009), during which the price of some units were reduced by nearly 30 percent.^{56,57} Cubix had also introduced a lease-to-own program to try to boost sales⁵⁸, but this strategy proved to be insufficient. The Cubix sales office had closed by May 2009⁵⁹ and

⁵⁴ Ibid.

⁵⁵ J.K. Dineen, “Lenders forcing price cuts at Blu, other S.F. condo developments,” *San Francisco Business Times*, 2 March 2009, < <http://www.bizjournals.com/sanfrancisco/stories/2009/03/02/story3.html>> (28 July 2009).

⁵⁶ James Temple, “Condo developers in S.F. hurting for buyers,” *San Francisco Chronicle*, 23 January 2009, < <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2009/01/23/BUCT15FAG1.DTL>> (28 July 2009).

⁵⁷ “Cubix Sales Update: 32% ‘Sold’ (And Now Offering ‘Lease-To-Own’),” 24 February 2009, < http://www.socketsite.com/archives/2009/02/cubix_sales_update_32_sold_and_now_offering_lease-to-own.html> (28 July 2009).

⁵⁸ Dineen.

⁵⁹ “Cubix (766 Harrison) Sales Office Currently Closed But Not Sold Out,” 7 May 2009, < http://www.socketsite.com/archives/2009/05/cubix_766_harrison_sales_office_appears_closed_but_not.html> (28 July 2009).

never managed to re-organize or re-open. A trustee sale of the unsold condos was held in July 2009. The outstanding developer's loan balance on the building was more than \$21 million.⁶⁰

3.2.3 Lessons Learned

The successes of Manville Apartments, The Pod Hotel, and Yotel, contrasted with the unfortunate fate of Cubix provide several valuable lessons for SmartSpaceTM:

- Those who are on a budget (e.g., graduate students) are willing to sign annual leases for small spaces; they are willing to sacrifice space for convenience and price.
- People are happy to live in small spaces for short periods of time if the place: 1) has high quality furnishings; 2) is located in a highly convenient area; and 3) is cheaper than other options in the same area.
- People view 250-350 s.f. of space as too small for long term residence, and thus the for-sale model does not work for units of this size.

These lessons indicate that for S2 to be successful, it should:

- operate as a rental with flexible lease terms
- be priced competitively
- have high quality furnishings to compensate for the smaller space
- be located in a highly convenient location, again to compensate for the small space

Additionally, it would be ideal for S2 to be located in close proximity to a group of users who would be interested in it. The unit sizes of Manville Apartments and Cubix are similar, but the success of one and the failure of the other are due to the different business models as well as the different demographics they are targeting. Manville Apartments has been popular because for UC Berkeley graduate students, a small studio can be highly desirable—it would give them maximum privacy at an affordable location. Also, as it is a rental, the students do not have any obligations to live in them for longer than their lease terms. On the other hand, even for first-time home buyers, Cubix units are still seen as too small. These potential buyers do not want to commit to living in a tiny unit for an extended amount of time in the event that they are not able to sell the unit. Also, they may feel that they would rather rent a larger unit, and accumulate savings to buy a larger condo rather than buy a small one, accumulate equity, and move up, as Cubix's developer has hoped.

⁶⁰ "SocketSite's Straight Scoop On The Collapse Of Cubix (766 Harrison)," 27 July 2009, <http://www.socketsite.com/archives/2009/07/socketsites_straight_scoop_on_the_collapse_of_cubix_766.html> (28 July 2009).

CHAPTER 4: TARGET MARKETS

This chapter reviews the demand for tiny homes in the U.S. and case cities. The demand was determined through interviews of housing representatives at major universities and a survey of potential tenants and owners. The chapter concludes that three groups are the primary target markets for S2:

- Graduate students
- Workers on temporary assignments (e.g., interns, traveling nurses, consultants, etc.)
- Recent movers

These groups provide the basis for developing S2 in areas where these groups are prevalent. They also indicate that S2 should operate as a rental with flexible lease terms.

4.1 Methodology

Because of its modern design and limited space, the proponents of S2 consider young singles to be the strongest potential market for the product. Two groups of particular interest are: single graduate students and young professionals. To gain insights on whether SmartSpace™ will be popular among single graduate students, interviews were conducted with Dennis Collins, Director of Housing at Massachusetts Institute of Technology (MIT) and Jim Jacobs, Interim Director of Housing at University of California, San Francisco (UCSF).

Secondly, a survey involving 14 individuals unaffiliated with S2 was conducted to gauge the market reception of S2. Of the survey participants, six were graduates students and eight were young professionals. The purpose of the survey was to collect feedback from its target audience regarding their thoughts on how long they will stay, what they like/dislike about S2, and any suggested improvements. To this end, the survey participants were given tours of the 178 sf S2 prototype as described in **2.4 S2 Prototype Unit**. Following the tour, each individual was asked the following questions in a structured interview. They were asked to respond considering a hypothetical 250 square feet S2 unit with a nook as described in 2.5 S2 Units in Development, but with the same built-in furniture as those in the prototype:

1. *What is the maximum time that you would be willing to live in S2?*
2. *If you were only willing to live in S2 for a maximum of six months or less, what would be the reason(s) for you not wanting to live there for longer?*
3. *If you were only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit needed for you to live there for one or more years?*
4. *If you have a choice between a 250 s.f. S2 unit furnished with multi-use furniture as seen in the prototype and a 300 s.f. conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?*
5. *What features do you like most about S2?*
6. *What features do you like least about S2?*
7. *What are your recommendations for changes to S2?*

Demographic information for the 14 participants of the survey is below:

Graduate Students:

1. 25-year-old Asian American Male
2. 26-year-old Caucasian Male
3. 26-year-old Mixed Female
4. 23-year-old Caucasian Female
5. 25-year-old Caucasian Male
6. 25-year-old Caucasian Male

Young Professionals:

1. 25-year-old Asian Male Private Equity Analyst
2. 25-year-old Asian American Male Consultant
3. 27-year-old Asian Male Software Engineer
4. 27-year-old Asian Female Graphic Arts Freelancer
5. 26-year-old Caucasian Male Software Developer #1
6. 26-year-old Caucasian Male Software Developer #2
7. 25-year-old Asian American Female Patent Engineer
8. 25-year-old Caucasian Male Patent Engineer

4.1 Single Graduate Students

4.1.1 Student Preferences at MIT and UCSF

According to Dennis Collins and Jim Jacobs, the efficiency/studio is the most popular type of housing for single graduate students at their respective institutions. At MIT, housing is assigned to each student who signs up for graduate housing by a lottery allocation process. At UCSF, housing is filled using a first-come, first-serve process rather than a lottery. According to Jacobs, there was a waitlist of 190 individuals for studios on the Parnassus campus, demonstrating their popularity.

Besides the obvious preference for studios over other types of floor plans, the MIT lottery also shows some other important trends. For example, according to Collins, MIT has historically had trouble filling Tang Residence Hall. Tang's relative unpopularity among students can be attributed to its older condition and tiny bedrooms (approximately 106 sf). Despite its lower rent, most students still opt for larger bedrooms/units in newer-built buildings. This trend shows that although there are some students who are on a very tight budget, most are happy to pay more for newer and larger space up to a limit. A subtler pattern is the relative unpopularity of smaller efficiencies compared to their larger counterparts. Most of MIT's efficiencies are about 260 square feet or larger. However, in the newly constructed Ashdown building that opened for the 2008-09 school year, there are 28 narrow efficiencies that are approximately 250 square feet. These efficiencies were categorized as "Small Efficiency" on the Lottery webpage and charged rents \$50 less per month compared to the regular efficiencies. Despite the reduction in rent, very few students signed up for them. Collins also mentioned that there have been some complaints

from the students about these small efficiencies, most of which involve the difficulty of fitting furniture inside them and the lack of wall space. These observations suggest that the optimal size for a traditional graduate student studio apartment unit is likely to be 260 sf or more. However, due to S2's built-in multi-use furniture, 250 s.f. may be sufficient.

Collins and Jacobs have different views on whether or not to furnish graduate housing units. Collins remarked that at MIT, most single graduate students prefer furnished units. Therefore, four out of the five single graduate residences are furnished. Collins says that MIT Housing has wanted to furnish the one residence that is still unfurnished, but its residents have expressed their desire to keep it unfurnished. In contrast, Jacobs feels that furnishings are tricky and expensive and leaves most of the graduate housing units at UCSF unfurnished. He says that the reception to furnishings at UCSF has been mixed in the past and that he would never furnish the units again.

4.1.2 Survey Results from Graduate Students

Survey results by respondent are shown in *Appendix B: Survey Results*. The responses from the six graduate students are summarized below. The number in parenthesis following each response represents the number of respondents with that response.

1. What is the maximum time that you would be willing to live in S2?

- Indefinitely (2)
- Six years (2)
- Four years (1)
- One month (1)

2. If you were only willing to live in S2 for a maximum of six months or less, what would be the reason(s) for you not wanting to live there for longer?

- N/A (5)
- feels somewhat claustrophobic (1)
- kitchen is small, cooks a lot (1)
- likes having people over (1)
- can find bigger space for cheaper (1)

3. If you were only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit needed for you to live there for one or more years?

- N/A (5)
- 270 sf (1)

4. *If you have a choice between a 250 s.f. S2 unit furnished with multi-use furniture as seen in the prototype and a 300 s.f. conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?*

- 250 s.f. S2 (5)
- 300 s.f. conventional (1)

5. *What features do you like most about S2?*

- convenience of not having to furnish it (5)
- Multi-use furniture (2)
- TV (1)
- convertible couch (1)
- Water draining on kitchen countertop (1)
- Built-in storage and lots of it (1)
- SmartBench™ (1)
- Ability to monitor energy use real-time (1)
- Modern style (1)
- Bathroom floor heater (1)

6. *What features do you like least about S2?*

- SmartBench™—multi-use enough that it doesn't serve either purpose; not a good table and not a good bench (1)
- Shower in the middle of the bathroom (1)
- Bathroom sink too small (1)
- How appliances are in closet (1)
- Narrow and long shape of unit (1)
- Partition between kitchen and appliances (1)
- How bathroom gets wet when you take a shower (1)
- Cooking and desk near each other; afraid work papers might get wet from kitchen (1)
- Feels like hotel—can't personalize or rearrange furniture (1)
- Halogen lights—will get hot in the summer (1)
- Lack of in-unit washer/dryer (1)
- Lack of dishwasher (1)

- Kitchen cabinets cannot fit certain items (1)
- Kitchen sink might be a bad shape (1)
- Second desk—not functional (1)
- Unable to have his own decorations (1)
- Stove in drawer (1)

7. *What are your recommendations for changes to S2?*

- Provide blinds/drapes/curtains (2)
- At least two burners (2)
- Put partition between kitchen and desk (1)
- Put stove on countertop and make pull out countertop (1)
- Put shower on the side instead of center of bathroom and with a groove for the water to drain (1)
- Make mirrors on the wall removable (1)
- Weighted shower curtain (1)
- Lofted bed (1)
- Make shelves adjustable (1)
- Slide-out cutting board (1)
- Smarter kitchen cabinets (1)
- Have drawers under the bed (1)
- Provide hooks for hanging pots/pans (1)
- Provide two soap dispensers—1 for dish detergent, 1 for soap (1)
- Provide space for sponge in kitchen (1)

4.1.3 Analysis and Conclusions

These survey responses show a generally positive reaction to SmartSpace™, with five out of the six participants indicating that they are willing to living in S2 for four or more years. Five out of six also mentioned the convenience of not having to furnish the place as one of their favorite features of S2, although a couple of the participants mentioned the lack of the ability to personalize, decorate, or rearrange furniture as one of their least favorite features. This may indicate the need for some flexibility in the furnishing, providing some opportunity to customize, for example. In addition, for the same location and price, five out of the six participants chose to go with the 250 s.f. furnished S2 over the 300 s.f. unfurnished conventional studio. This mixed reception to furnishings, with a heavy preference for a furnished unit rather than an unfurnished one, is consistent with the pattern seen at MIT.

Based on these informal survey results, it seems that S2's would be quite popular among most graduate students. The group of graduate students who might not find it appealing are those who 1) are used to or strongly prefer bigger living spaces, 2) spend a lot of time cooking, 3) like to entertain guests, or 4) prefer to have their own furniture/decorations. To mitigate some of these shortcomings, some simple improvements are being made to the units in development. For example, having two burners instead of one and larger kitchen cabinets would please those who cook often. Providing grilling facilities and a community recreation area in back of the building would allow more social types to entertain using common amenities. Making the mirrors on the wall removable would allow someone to redecorate. The nook space would provide sufficient space for at least one item of personal furniture.

Such changes help to tune the product to the market, helping to address some of the concerns mentioned above and to attract a wider range of single graduate students. They would not address the size issue, however. At the same time, due to the success of small efficiencies currently in the graduate housing market, the 250 sf size has already proven itself. For example, according to Collins, the demand for the studios in MIT's new Ashdown House, which are about 260 s.f., have been much greater than the supply in both the 2008-09 and 2009-10 academic years' housing lotteries. Even the narrower 250 s.f. units had no trouble filling up. These statistics are for conventional units with traditional furniture. Collins feels that S2 would have an edge over a similar sized conventional studio because of its built-in, multi-purpose furniture. Therefore, based on the survey results, the performance of existing small efficiencies, and Collins' expert opinion, S2 seems poised for success in the single graduate student housing market.

4.2 Other Users

4.2.1 Survey Results from Young Professionals

Survey results are shown in **Appendix B: Survey Results**. The responses from the eight young professionals are summarized below:

1. *What is the maximum time that you would be willing to live in S2?*
 - One year (3)
 - Three months (2)
 - Two Years (1)
 - Six months (1)
 - One month (1)

2. *If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?*
 - N/A (4)
 - Size (3)
 - Not personalized/ability to personalize limited, feels like a hotel (1)

- Bathroom is too small to be comfortable (1)
 - Lack of in-unit washer/dryer (1)
 - Lack of dishwasher (1)
 - Tiny refrigerator; cooks a lot (1)
 - Need more space, especially for the kitchen and closet (1)
 - Not enough storage space (1)
3. *If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?*
- N/A (3)
 - 500 sf (2)
 - 400 sf (2)
 - 300 sf (1)
4. *If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?*
- 250 s.f. S2 (5)
 - 300 s.f. conventional (2)
5. *What features do you like most about S2?*
- SmartBench™ (3)
 - Bathroom (2)
 - Smart, multi-use design (1)
 - Lighting (1)
 - Height of the space (1)
 - Surround sound (1)
 - Modern style (1)
 - Convenience of not having to furnish it (1)
 - Built-in water drainer (1)
 - Price (1)
 - Efficient use of space (1)

- Storage space near ceiling (1)
- Technology details (e.g., optics, drawers don't bang) (1)
- Bathroom floor heater (1)
- Compact kitchen—don't cook a lot (1)
- Door that separates living space/kitchen from rest of apartment (1)

6. *What features do you like least about S2?*

- Pull-out stove (2)
- Shower (2)
- Bookshelves (2)
- Refrigerator—too small (2)
- Spaces not defined (2)
- Bathroom—small sink, shower gets everything wet (1)
- Sliding doors for the storage space near the ceiling—feels like it would be difficult to fit in certain large items (1)
- Kitchen cabinets—not big enough (1)
- Convertible couch uncomfortable as a couch or bed (1)
- Kitchen sink--too small (1)
- Secondary desk—space limited (1)
- Kitchen (1)
- Not enough storage space (1)
- Kitchen in the living space (will make it smell) (1)
- TV is set a little too high—when you sit on the couch you have to see it at an angle (1)

7. *What are your recommendations for changes to S2?*

- Put the stove on the counter space and have pull-out counter space instead (2)
- Remote for the lights (1)
- Change the sliding doors for the storage space near the ceiling to a different type of door, e.g. airplane overhead storage door, so it is easier to move large items in there (1)
- More shelves in the colored built-in space area (1)
- Provide a safe behind one of the mirrors (1)

- Reverse the kitchen/living space and nook space (1)
- Make bathroom smaller (have used smaller ones in Britain) and make other spaces (kitchen and living space) bigger (1)
- Eliminate the second desk and make the primary working area better (1)

4.2.2 Analysis and Conclusions

These survey results show that young professionals tend to have a stronger preference for larger living space than graduate students, with half of the respondents willing to live in S2 for a maximum of six months or less, citing the size of the space as a primary reason for not wanting to live there for longer. Most of the graduate students surveyed are currently sharing an apartment with a roommate(s) because their limited stipends put them on a budget. Therefore, a studio apartment is seen as an upgrade to their current living situation. On the other hand, the many of young professionals surveyed already have high-income jobs that support their current living situation. They are currently living in larger units or shared houses and do not see the need to move into a smaller space such as S2.

Moreover, young professionals did not seem to appreciate the convenience of S2 as much as the graduate students did. For example, only one young professional out of the eight surveyed cited the convenience of not having to furnish the place as a favorite feature. In contrast, five out of the six graduate students surveyed mentioned this factor as a favorite feature. The reason for this difference is that while students generally know how long they are going to be living in an apartment, professionals are looking for a longer-term residence as it is possible they stay at their unit for a long time, depending on how things go with their employment, and they want to personalize it. Therefore, many students prefer a furnished unit while professionals prefer to personalize a space with furniture that they pick out.

The general impression of S2 from the young professionals' point of view is that it is a great place to stay for a temporary period of time—more livable than a hotel and much cooler, but not a primary residence. Therefore, the appeal of S2 as a permanent residence apartment is likely to be limited for the general young professionals market. However, survey results showing that respondents are comfortable staying in S2 for three or more months demonstrate S2's appeal as a temporary home. Thus, it is recommended that S2 target certain subgroups within the professionals market, such as consultants, interns, contractors, or traveling nurses. These types of professionals know that they are staying at a place for a limited amount of time and would appreciate the convenience of not having to buy/rent/sell furniture. Institutions that employ these professionals might be attracted to the cheaper price tag of S2 compared to extended stay hotels or corporate apartments. Besides temporary workers, S2 can also be marketed for recent movers. Several respondents mentioned that S2 would be perfect if they just moved to a new city for a new job. They could stay in S2 for a month or two before finding a more permanent home. Products that were developed with a similar concept, such as The Pod Hotel or Yotel, as described in detail in Chapter 3, have had tremendous success in the hotel industry. Since S2 is much larger than either of those products and has more amenities, it should have much of the same success as an extended stay hotel as long as it is in a convenient, central location.

CHAPTER 5: LOCATIONS, SITES AND BUILDING TYPES

In this chapter, Manhattan and San Francisco were studied for potential sites for SmartSpace™. The criteria used to identify sites include rental and demographic data and proximity to institutions and workplaces. The results show that these neighborhoods within each city/borough are the best locations for S2 development:

- Manhattan: Financial District, Gramercy, Greenwich Village, and Midtown
- San Francisco: Pacific Heights and Western Addition

In addition, building types and ideal site characteristics are also explored. The chapter concludes by examining the site that Panoramic Interests has in mind for developing the first SmartSpace™ building, 2711 Shattuck Avenue, Berkeley, CA, using the same set of criteria as that used in the location selection process as well as more site-specific information. Based on this analysis, the proposed site is judged to be a fair location.

5.1 The Selection of Manhattan and San Francisco

The search for potential sites for SmartSpace™ was conducted using a top-down approach, starting at the national level. 2008 estimates by GeoLytics, a provider of demographic data, census demographics, market research data, and geocoding for social researchers and business marketing, were then used for demographic data. GeoLytics 2008 estimates are available at the nation, state, county, tract, and block levels. To determine which areas within the United States should be studied in depth for potential S2 locations, demographic data was first analyzed at the county level for the nation's 3,141 counties and county equivalents.⁶¹ The county level was selected as it provides much better granularity than the state level. At the same time, unlike a tract or block, each county or county equivalent is large enough for holistic, detailed analysis.

Because building small units like S2 only makes sense in high-density areas, population density was the first factor that was looked at. The nation's five most densely populated counties are listed below:

County Name	State	Population Density (Persons per Square Mile)
New York	NY	71,293
Kings	NY	36,024
Bronx	NY	32,448
Queens	NY	20,854
San Francisco	CA	15,996

Figure 5.1.1: Population Density Chart⁶²

Next, these five high-density counties were examined for the existence of a single, highly educated population, as people of this profile are the ones who are interested in and able to afford

⁶¹ The term *county equivalents* includes three additional types of administrative divisions that are different from the type of county found in most states: Alaska census areas, independent cities, and Washington, D.C.

⁶² GeoLytics

living in S2. The following chart shows the number of one-person households, and 25+ year olds with Bachelor or Higher Degree persons per square mile.

County/CITY Name	One-Person Household	25+ years old with Bachelor or Higher Degree
New York	4,215	6,648
Kings	1,156	1,593
Bronx	1,207	1,079
Queens	1,075	1,992
San Francisco	1,754	3,587

Figure 5.1.2: Demographics by County Chart⁶³

The data shows that although San Francisco County’s overall population density is lower than that of Kings, Bronx, and Queens counties, it has a higher number of single households and higher educated persons per square mile. As New York County has the same boundaries as the Borough of Manhattan, one of the five boroughs of New York City, and San Francisco County has the same boundaries as the City of San Francisco, they will be referred to as Manhattan and San Francisco, respectively, from this point forward.

Interestingly, New York City and San Francisco are also the top two cities in the nation in terms of rents⁶⁴ and construction costs.⁶⁵ As S2 is designed to seek lower rent on a per unit basis than larger conventional apartments, it would be an attractive option in a city with high rents. Additionally, since S2’s construction costs are expected to be lower as the units will be manufactured instead of built on site, the S2 developer would be able to better compete with other developers in a land bidding process if the other developers’ construction costs are significantly higher. Thus, it makes the most sense to build S2 in the cities with the highest rents and construction costs. Therefore, the New York City borough of Manhattan and the City of San Francisco are selected for further study for the following reasons:

- High overall population density
- High number of single households
- Highly educated population
- High rents
- High construction costs

5.2 Location Selection Methodology

The previous chapter identified graduate students, workers on temporary assignments and recent movers as likely users of S2. Accordingly, in this chapter, analysis was conducted on a neighborhood level for Manhattan and San Francisco to identify the best locations for S2,

⁶³ Ibid.

⁶⁴ Matt Woolsey, “Best and Worst Cities For Renters,” *Forbes.com*, 7 January 2008, <http://www.forbes.com/2008/01/07/rentals-US-expensive-forbeslife-cx_mw_0107realestate.html> (14 July 2009).

⁶⁵ Ryunosuke Konishi, “Higher Occupancy *Humanism*: The Trade-Offs for Encouraging Middle Income Housing in a Global City” (Master thesis, Massachusetts Institute of Technology, 2003), 11-12.

defined as the neighborhoods that are most likely have potential users for S2. The factors used for analysis were:

- Median Rents for Studio Apartments
- Demographic Information
 - Percentage of Population with Bachelor or Higher Educational Degree
 - Percentage of Population in 20s and 30s
 - Percentage of Population that is Single
 - Average Household Size
 - Average Commute Time
 - Profile of People Living in Neighborhood
- Location of Schools Offering Graduate Degrees and Hospitals

These factors are explained below.

5.2.1 Neighborhoods

The neighborhoods used are those defined by Zillow, an online real estate service. There are 28 in Manhattan and 34 in San Francisco. These neighborhoods are shown in Figures 5.2.1 and 5.2.2 below:



Figure 5.2.1: Manhattan Neighborhoods⁶⁶

Note that due to the shape of Figure 5.2.1 and limited space on the diagram, some of the Manhattan neighborhoods are not labeled while some neighborhoods of other boroughs of New York City are labeled. For more detailed maps of Lower, Midtown and Upper Manhattan showing all 28 neighborhoods analyzed, see *Appendix C: Manhattan Neighborhoods*.

⁶⁶ Google Earth

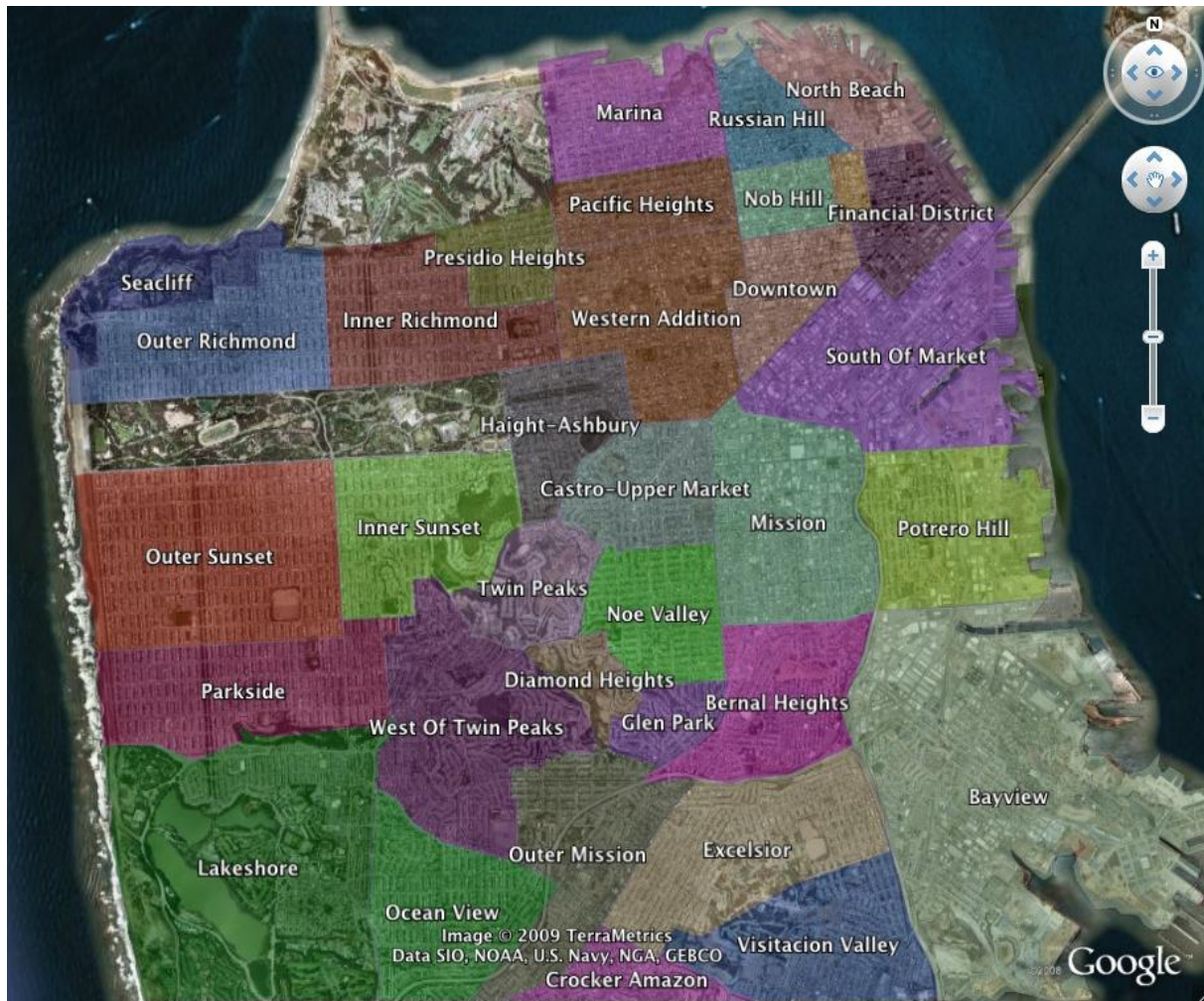


Figure 5.2.2 San Francisco Neighborhoods⁶⁷

With the exception of Chinatown, which is situated between Nob Hill and the Financial District, all neighborhoods analyzed are labeled in Figure 5.2.2.

5.2.2 Median Rents for Studio Apartments

The first factor considered was the median rent per month for a studio apartment in each neighborhood. Rental data by neighborhood was gathered from Zilpy, an online rental market facts and analysis service that collects data from all available sources (newspaper classifieds, online classifieds, apartment rentals, etc.). Rents for studios are important as they indicate how much one must currently pay for a conventional apartment unit that is comparable to S2. They also reflect the general desirability of a neighborhood, accounting for characteristics such as ease of transportation, safety, and proximity to workplaces, stores, restaurants, etc. The neighborhoods with above borough- or city-wide median rents⁶⁸ are considered to be better sites

⁶⁷ Ibid.

⁶⁸ Borough-wide median rent for studio apartments was not available for Manhattan on Zilpy, so a proxy was created by taking the average of the median rents in each neighborhood weighted by the number of listings.

for S2 because renters are more likely to view S2 as an attractive, cheaper-priced option compared to the studios currently in the market. In the less desirable neighborhoods, where rents tend to be lower, there is less of a need to sacrifice space.

5.2.2 Demographic Information

Demographic information by neighborhood was collected from Zilpy and Zillow. The information comes from data in the 2000 U.S. Census. Neighborhoods with the following characteristics are considered to be the most fitting for S2 development:

- Above Borough/City⁶⁹ Percentage of Population with Bachelor or Higher Educational Degree
- Above Borough/City Percentage of Population in 20s and 30s
- Above Borough/City Percentage of Population that is Single
- Below Borough/City Average Household Size
- Below Borough/City Average Commute Time
- Main Types of People Living in Neighborhood:
 - Bright Lights, Big City
 - College Life
 - Corporate Climbers
 - Makin' It Singles
 - Multi-lingual Urbanites
 - Power Singles

The above criteria for education level, age, marital status, and household size aim to find those who are living by themselves and/or those who can afford to live by themselves. They also fit the profile of graduate students, which compose one of the targeted groups of S2 users. Commute time indicates proximity and ease of transportation to workplaces. For workers on temporary assignments and recent movers looking for convenience, a short commute to work is likely one of the most important factors in their decision as to where to rent. Therefore, neighborhoods with below average commute times are considered to be better for S2 development. Finally, based on data (such as age, occupation, and income) from the 2000 U.S. Census, Zillow's analysts used segmentation methods to create groupings of people based on the demographic and socioeconomic composition of each neighborhood. For each neighborhood, Zillow lists the three main types of people living in there. The full list of types of people living in the neighborhoods of Manhattan and San Francisco, along with the definition of each type, is located in *Appendix D: Zillow People Profile Definitions*. When searching for locations for S2 development, the neighborhoods with the following six types of people are considered desirable:

⁶⁹ While city-wide data was available for San Francisco on Zilpy and Zillow, borough-wide data for Manhattan was not available from these sources. Therefore, they were calculated manually using available statistics for the neighborhoods.

- **Bright Lights, Big City** — Very mobile singles living in the city. Singles ranging in age from early 20s to mid-40s who have moved to an urban setting. Most rent their apartment or condo. Some have a college education and work in services and the professional sector.
- **College Life** — Students in higher education. These individuals are enrolled in college or graduate school. People in college or graduate school.
- **Corporate Climbers** — High-income, high-expense urban singles. Urban singles with an up-and-coming income, but with higher-than-average living costs. Most have college educations and are employed in mid-management professions.
- **Makin' It Singles** — Upper-scale urban singles. Pre-middle-age to middle-age singles with upper-scale incomes. May or may not own their own home. Most have college educations and are employed in mid-management professions.
- **Multi-lingual Urbanites** — Urban dwellers who speak more than one language. Some have a high school or college education, and they work in a variety of occupations. Moderate to upper-scale earning potential.
- **Power Singles** - High-income urban singles. Highly educated professionals, many with advanced degrees. They draw a handsome salary and have reasonable living expenses while living a hip, upscale life in an urban center.

5.2.3 Location of Schools Offering Graduate Degrees and Hospitals

Because graduate students are potential users of S2, the locations of schools offering graduate degrees were identified within Manhattan and San Francisco. These schools include colleges, universities, art academies, music conservatories, seminaries, etc. The lists of these schools and their locations are located in *Appendix E: Lists of Institutions*. As graduate students highly value proximity to campus⁷⁰, neighborhoods containing graduate-degree granting institutions are considered good locations for S2 development.

Similarly, because workers on temporary assignments are also potential users of S2, the locations of hospitals were identified in Manhattan and San Francisco as well. The lists of hospitals and their locations are also located in APPENDIX E. Hospitals employ transient workers such as traveling nurses or medical interns. Because these staff members work long shifts, they likely want to live very close to their place of work. Thus, neighborhoods containing hospitals are considered good locations for S2 development.

5.3 Location Selection Results

5.3.1 Manhattan

⁷⁰Han, 85.

Figure 5.3.1 is a matrix showing the factors considered for each of the 28 neighborhoods in Manhattan. Favorable statistics are highlighted.

Neighborhood	Median Rent for Studio	% Pop. Bachelor or Higher Degree	% Pop. 20s & 30s	% Pop. Single	Avg. Hshld. Size	Avg. Commute Time (Mins.)	Who Lives Here?			Graduate School(s) Present?	Hospital(s) Present?
Little Italy	\$2,323	22.0%	39.8%	42.1%	2.22	27.0	Non-native Newbies	Makin' It Singles	Bright Lights, Big City	No	No
Battery Park	\$2,200	61.0%	48.2%	36.9%	1.80	26.3	Non-native Newbies	Power Singles	Bright Lights, Big City	No	No
West Village	\$2,200	65.0%	47.1%	57.4%	1.54	27.6	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	No	No
TriBeCa	\$2,200	52.0%	36.1%	37.2%	2.00	27.9	Power Singles	Makin' It Singles	Multi-lingual Urbanites	Yes	No
Carnegie Hill	\$2,125	62.0%	30.0%	33.0%	2.00	31.1	Urban Power Families	Power Singles	Multi-lingual Urbanites	No	No
Financial District	\$2,117	47.0%	48.7%	53.5%	1.78	25.5	Corporate Climbers	Multi-lingual Urbanites	Bright Lights, Big City	Yes	Yes
Clinton	\$2,110	43.0%	49.8%	58.0%	1.71	27.0	Power Singles	Makin' It Singles	Bright Lights, Big City	No	No
Gramercy	\$2,075	56.0%	51.7%	57.8%	1.57	27.1	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	Yes	Yes
Murray Hill	\$2,000	60.0%	49.4%	52.8%	1.48	26.5	Non-native Newbies	Power Singles	Bright Lights, Big City	Yes	No
North Sutton Area	\$1,975	63.0%	30.5%	34.6%	1.61	27.1	Power Singles	Golden Years	Multi-lingual Urbanites	No	No
SoHo	\$1,975	57.0%	44.0%	48.6%	1.71	27.0	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	No	No
Garment District	\$1,944	51.0%	63.4%	55.9%	1.70	26.2	Non-native Newbies	Corporate Climbers	Makin' It Singles	No	No
Upper West Side	\$1,900	54.0%	38.9%	44.6%	1.71	31.7	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	Yes	No
Chelsea	\$1,900	51.0%	45.3%	57.4%	1.58	27.2	Power Singles	Makin' It Singles	Bright Lights, Big City	Yes	No
Greenwich Village	\$1,900	59.0%	44.5%	57.2%	1.54	25.1	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	Yes	Yes
Midtown	\$1,850	58.0%	45.2%	48.4%	1.53	25.8	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	Yes	Yes
Upper East Side	\$1,850	62.0%	40.3%	42.5%	1.68	31.7	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	Yes	Yes
Central Park	\$1,800	N/A	37.8%	43.5%	1.67	30.6	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	Yes	No
East Village	\$1,750	34.0%	52.5%	60.1%	1.72	29.0	Power Singles	Makin' It Singles	Bright Lights, Big City	Yes	No
Morningside Heights	\$1,673	33.0%	42.8%	47.7%	2.11	30.9	Non-native Newbies	Melting Pot	College Life	Yes	No
Lower East Side	\$1,650	11.0%	31.9%	31.4%	2.44	32.2	Non-native Newbies	Golden Years	Multi-lingual Urbanites	No	Yes
Yorkville	\$1,400	12.0%	39.7%	49.0%	2.29	31.2	Non-native Newbies	Power Singles	Melting Pot	No	Yes
Harlem	\$1,275	9.0%	33.3%	49.8%	2.26	36.9	Melting Pot	Unmarried With Children	Aspiring Urbanites	Yes	Yes
Hamilton Heights	\$1,150	3.0%	34.4%	42.7%	2.69	37.6	Shoestring Singles	Foreign-born Urbanites	Aspiring Urbanites	Yes	No
Inwood	\$1,129	12.0%	35.5%	38.0%	2.50	42.6	Foreign-born Urbanites	Power Singles	Multi-lingual Urbanites	No	No
East Harlem	\$1,100	3.0%	31.1%	46.9%	2.75	37.1	Shoestring Singles	Non-native Newbies	Melting Pot	Yes	No
Washington Heights	\$1,079	11.0%	33.8%	38.7%	2.65	39.9	Foreign-born Urbanites	Power Singles	Aspiring Urbanites	Yes	No
Chinatown	N/A	11.0%	34.6%	34.7%	2.48	28.6	Non-native Newbies	Makin' It Singles	Elder Renters	No	No
Manhattan Borough	\$1,849	35.8%	39.5%	45.7%	2.05	32.3	N/A	N/A	N/A	N/A	N/A

Figure 5.3.1 Manhattan Neighborhood Matrix⁷¹

These results show that the best neighborhoods to develop S2 in Manhattan are: Financial District, Gramercy, Greenwich Village, and Midtown. Other neighborhoods to be considered are: Murray Hill, Upper West Side, Chelsea, and Upper East Side.

5.3.2 San Francisco

Figure 5.3.2 is a matrix showing the factors considered for each of the 34 neighborhoods in San Francisco. Favorable statistics are highlighted.

⁷¹ Data gathered or calculated from information provided by Zilpy and Zillow

Neighborhood	Median Rent for Studio	% Pop. Bachelor or Higher Degree	% Pop. 20s & 30s	% Pop. Single	Avg. Hshld. Size	Avg. Commute Time (Mins.)	Who Lives Here?			Graduate School(s) Present?	Hospital(s) Present?
Financial District	\$2,223	40.0%	52.6%	52.2%	1.50	24.3	Non-native Newbies	Corporate Climbers	Bright Lights, Big City	Yes	No
North Beach	\$1,890	46.0%	41.7%	43.1%	1.80	27.9	Foreign-born Urbanites	Power Singles	Makin' It Singles	Yes	No
South Of Market	\$1,768	32.0%	52.3%	52.6%	1.59	25.8	Corporate Climbers	Makin' It Singles	Bright Lights, Big City	Yes	No
Inner Richmond	\$1,695	40.0%	40.4%	43.7%	2.32	33.3	Foreign-born Urbanites	Urban Power Families	Power Singles	Yes	No
Marina	\$1,570	66.0%	56.3%	52.7%	1.59	31.9	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	No	No
Pacific Heights	\$1,498	68.0%	47.7%	47.8%	1.65	31.2	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	Yes	Yes
Nob Hill	\$1,495	40.0%	45.3%	50.9%	1.72	28.9	Foreign-born Urbanites	Power Singles	Bright Lights, Big City	No	Yes
Russian Hill	\$1,495	43.0%	43.8%	44.6%	1.76	30.3	Foreign-born Urbanites	Power Singles	Bright Lights, Big City	Yes	No
Western Addition	\$1,460	41.0%	49.8%	56.7%	1.87	30.4	Power Singles	Makin' It Singles	Bright Lights, Big City	Yes	Yes
Glen Park	\$1,450	46.0%	34.2%	43.4%	2.19	30.7	Urban Power Families	Power Singles	Multi-lingual Urbanites	No	No
Chinatown	\$1,435	9.0%	21.5%	26.2%	2.12	32.9	Non-native Newbies	Makin' It Singles	Elder Renters	No	Yes
Inner Sunset	\$1,425	48.0%	43.1%	43.4%	2.26	32.7	Foreign-born Urbanites	Power Singles	Multi-lingual Urbanites	Yes	Yes
Mission	\$1,401	25.0%	48.2%	53.5%	2.66	31.0	Non-native Newbies	Power Singles	Makin' It Singles	Yes	Yes
Castro-Upper Market	\$1,395	60.0%	47.9%	66.9%	1.72	31.5	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	No	No
Lakeshore	\$1,395	35.0%	23.7%	27.0%	2.66	33.1	Foreign-born Urbanites	Urban Power Families	Golden Years	Yes	No
Twin Peaks	\$1,373	54.0%	36.2%	52.5%	1.75	34.1	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	No	Yes
Potrero Hill	\$1,350	48.0%	39.9%	49.9%	2.10	29.8	Power Singles	Melting Pot	Makin' It Singles	Yes	No
Outer Richmond	\$1,325	36.0%	35.0%	37.3%	2.44	36.2	Foreign-born Urbanites	Urban Power Families	Power Singles	Yes	No
Haight-Ashbury	\$1,298	55.0%	58.6%	60.0%	1.97	32.6	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	Yes	Yes
Presidio Heights	\$1,275	55.0%	39.8%	40.9%	2.02	31.1	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	Yes	Yes
Downtown	\$1,225	24.0%	47.4%	56.1%	1.61	27.9	Non-native Newbies	Power Singles	Bright Lights, Big City	Yes	No
Excelsior	\$1,200	N/A	30.6%	32.8%	3.67	33.4	Foreign-born Urbanites	Urban Power Families	Stable Nuclears	No	No
West Of Twin Peaks	\$1,200	43.0%	24.8%	31.9%	2.57	31.9	Foreign-born Urbanites	Urban Power Families	Multi-lingual Urbanites	No	No
Outer Sunset	\$1,198	31.0%	33.7%	35.5%	2.80	37.3	Foreign-born Urbanites	Urban Power Families	Power Singles	No	No
Noe Valley	\$1,190	57.0%	43.9%	51.5%	1.95	32.7	Power Singles	Multi-lingual Urbanites	Bright Lights, Big City	No	No
Bayview	\$1,100	N/A	29.0%	36.0%	3.62	31.6	Foreign-born Urbanites	Stable Nuclears	Golden Years	Yes	No
Bernal Heights	\$1,100	30.0%	37.5%	43.8%	2.70	31.3	Foreign-born Urbanites	Power Singles	Multi-lingual Urbanites	No	No
Ocean View	\$1,100	N/A	30.1%	32.5%	3.35	34.8	Foreign-born Urbanites	Stable Nuclears	Wise Old Urbanites	No	No
Parkside	\$950	31.0%	29.2%	33.0%	2.82	36.7	Foreign-born Urbanites	Urban Power Families	Golden Years	No	No
Outer Mission	\$799	21.0%	32.7%	36.1%	3.15	32.2	Foreign-born Urbanites	Power Singles	Stable Nuclears	No	No
Visitacion Valley	N/A	N/A	30.6%	33.3%	3.86	33.7	Foreign-born Urbanites	Stable Nuclears	Urban Empty Nesters	No	No
Crocker Amazon	N/A	N/A	28.9%	32.8%	3.64	33.1	Foreign-born Urbanites	Stable Nuclears	Golden Years	No	No
Diamond Heights	N/A	44.0%	31.7%	44.7%	2.01	32.5	Power Singles	Makin' It Singles	Multi-lingual Urbanites	No	No
Seacliff	N/A	54.0%	22.1%	18.6%	2.55	27.5	Urban Power Families	Multi-lingual Urbanites	High \$\$ DINKS	No	No
San Francisco City	\$1,450	35.0%	39.8%	44.8%	2.30	32.2	Non-native Newbies	Foreign-born Urbanites	Power Singles	N/A	N/A

Figure 5.3.2 San Francisco Neighborhood Matrix⁷²

These results show that the best neighborhoods to develop S2 in San Francisco are Pacific Heights and Western Addition. Other neighborhoods to be considered are: Financial District, North Beach, South of Market, Nob Hill, Russian Hill, and Inner Sunset.

5.3.3 Commentary

⁷² Data gathered or calculated from information provided by Zilpy and Zillow

It is important to note that while the neighborhoods listed above are the most likely to have users of SmartSpace™, there are other important factors to be considered when selecting locations for S2. For example, although the Midtown neighborhood of Manhattan has many young singles who may find S2 to be an attractive housing option, much of the land there is zoned for commercial use only.^{73,74,75} Therefore, it may be challenging to find a site for S2 development in that neighborhood. At the same time, neighborhoods in which the overall population does not match the profile of S2 users might have an institution with severe housing shortages, and building S2 close to the institution would make sense. Thus, the results above are intended to be guidelines only. Whether or not a particular neighborhood is ideal for S2 development also depends on zoning restrictions and other characteristics of the area.



5.4 Building Types

Building types for S2 could be varied—they could be low-, mid-, or high-rises depending on what makes the most sense for the surrounding context. Although only ground-up development is explored at this point, fitting manufactured units into existing buildings is also possible in the future. This section explains two illustrative examples of what an S2 building could look like.

In commercial districts where land values are extremely high, the only way to make S2 economically feasible is to build up. Since the width of each S2 unit is only 10 feet 11 inches, S2 can take advantage of sites with very little frontage space by building a few units on each floor and stacking up. There are precedents for this kind of building in New York City: “slivers.” Sliver buildings are condominium towers rising high above narrow lots. Figure 5.4.1 shows a rendering of a new sliver condo tower at 785 Eighth Avenue in Midtown Manhattan. The project calls for 122 condominiums—two to four per floor. It is 23 feet wide in front, 44 feet at the rear, and 566 feet high.⁷⁶ Because of its prime location and proximity to workplaces, a high-rise residential building in a commercial district would likely be an attractive housing option for a consultant on a temporary assignment or a young professional who has just moved to a new city to work in one of the office towers nearby.

Figure 5.4.1 Sliver Building⁷⁶

⁷³ Michael Gedal, conversation with author, via phone, 7 July 2009.

⁷⁴ The New York City Planning Commission, “Zoning Map 8c,” <http://www.nyc.gov/html/dcp/pdf/zone/map8c.pdf> (20 July 2009).

⁷⁵ The New York City Planning Commission, “Zoning Map 8d,” <http://www.nyc.gov/html/dcp/pdf/zone/map8d.pdf> (20 July 2009).

⁷⁶ Josh Barbanel, “Tall and Thin, Back in Fashion,” *New York Times*, 18 March 2007, <http://www.nytimes.com/2007/03/18/realestate/18Deal1.html?ref=realestate> (20 July 2009).



Figure 5.4.2: Modern Low-Rise in Residential Neighborhood⁷⁷

Another type of building conceived for S2 is the low-rise currently in development. This type of building is fit for residential neighborhoods such as Gramercy in Manhattan or Pacific Heights in San Francisco. These areas are valued for their quiet, peaceful setting, and are desirable places to live for graduate students, traveling nurses or medical interns, especially if their campus or hospital is a short walk away. Figure 5.4.2 shows how a modern low-rise building can fit into a residential neighborhood.

5.5 Site in Berkeley, California

Panoramic Interests has chosen to develop the first SmartSpaceTM building at 2711 Shattuck Avenue, Berkeley, CA 94705. Figure 5.5.1 is a map of the location.

⁷⁷ Equity Residential, "Touriel Building," < <http://www.equityapartments.com/san-francisco-bay/berkeley/touriel-building.aspx> > (21 July 2009).

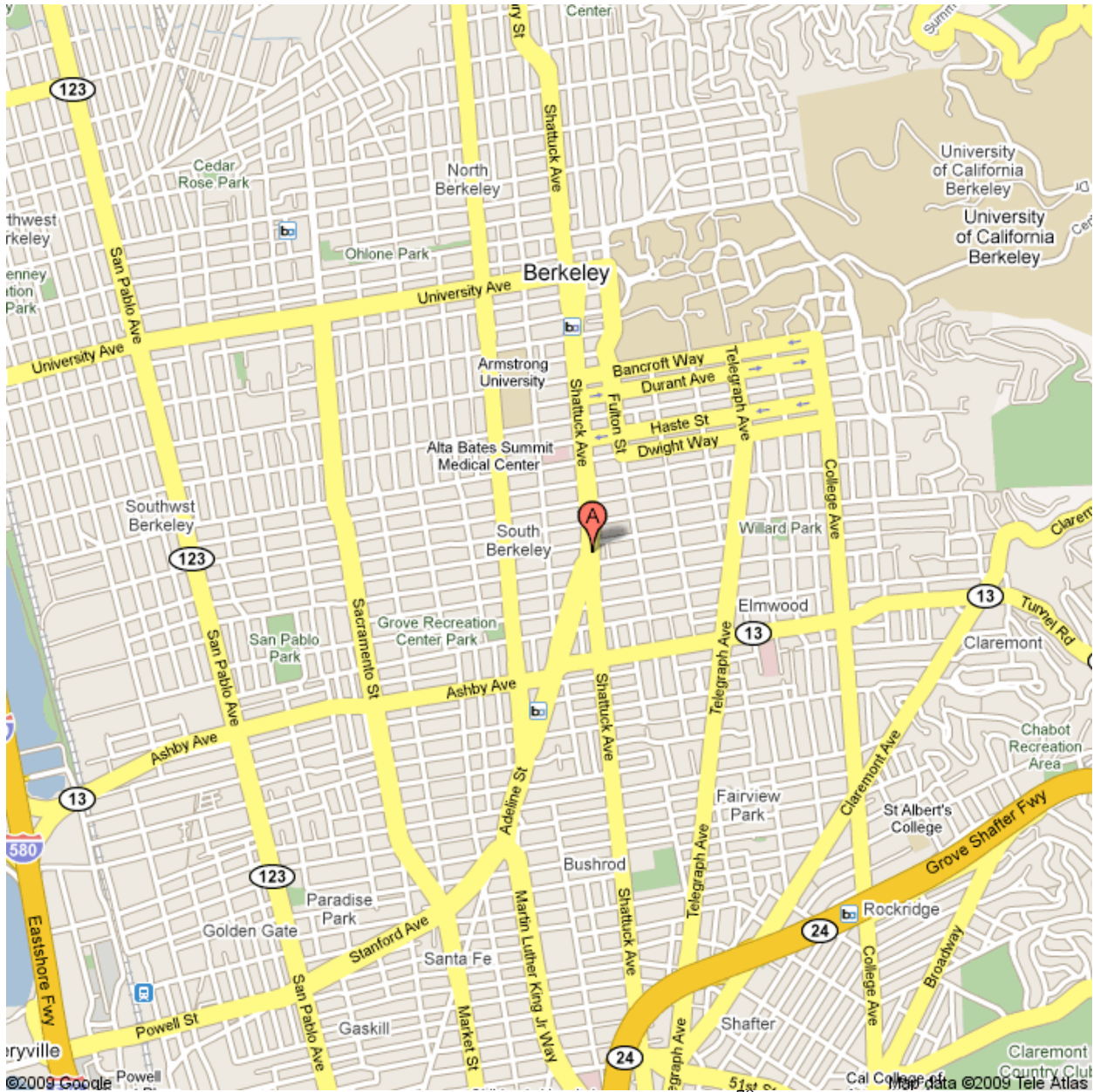


Figure 5.5.1 Map of 2711 Shattuck Avenue, Berkeley, CA 94705⁷⁸

The site is currently a parking lot located in between a storage building and an abandoned structure with a parking lot. The size of the lot is about 5,000 square feet, with approximately 45 feet of frontage. Figure 5.5.2 is a view of the lot from Shattuck Ave. and Figure 5.5.3 is a rear view.

⁷⁸ Google Maps



Figure 5.5.2 Site—Street View

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Figure 5.5.3 Site—Rear View

© Panoramic Interests

The site is located approximately 0.7 mile south of the Downtown Berkeley Bay Area Rapid Transit (BART) station and 0.5 mile north of the Ashby BART station. A Line 18 bus stop is steps away. This bus line stops about every 15 minutes, runs along Shattuck Ave., and stops at the Downtown Berkeley BART station (which is very close to the UC Berkeley campus). Two blocks away from the site is the popular Berkeley Bowl Marketplace, a full-service supermarket. Across from Berkeley Bowl is a large Walgreens drugstore. Also close by are two campuses of the Alta Bates Summit Medical Center, one about 0.5 mile north on Shattuck Ave., and the other about 0.7 mile southeast on Ashby Ave. The walking distance from the site to the West entrance of UC Berkeley is 0.9 mile—about an 18-minute walk.

The immediate surroundings along Shattuck Ave. consist of auto dealerships, a video rental store, a yoga studio, an outdoor sportswear store, and a few restaurants. The site faces the busiest intersection in the city of Berkeley, the three-way intersection of Shattuck, Adeline, Ward Streets, where the daily traffic is 36,000 vehicles.⁷⁹ To the east of the site, on the smaller cross streets off of Shattuck, is a quiet residential neighborhood consisting of mostly single-family houses. The storage building adjacent to the S2 site is UC Storage, an 800-storage-unit facility owned by Panoramic Interests. There has been a five-story, 23-unit condominium mixed-use project with 3,200 s.f. of commercial/retail space approved to be built at the abandoned area on the other side of the S2 site, although it is unclear whether this project will be built as of now.^{80,81}

Figure 5.5.4 shows some rental and demographic statistics for Berkeley and the 94705 zip code area juxtaposed to those for San Francisco:

	San Francisco	Berkeley	94705 Zip Code Area
Population Density (Persons/ Mi²)	10,000	9,823	6,413
Median Rent for Studio	\$1,450	\$993	\$1,100
% Pop. Bachelor or Higher Degree	35%	41%	57%
% Pop. 20s & 30s	40%	41%	N/A
% Pop. Single	45%	51%	N/A
Avg. Hshld. Size	2.30	2.16	2.16
Avg. Commute Time (Mins.)	32.2	29.06	N/A
Who Lives Here?	Non-native Newbies, Foreign Born Urbanites, Power Singles	Power Singles, Corporate Climbers, College Life	N/A

Figure 5.5.4 Berkeley Site Matrix⁸²

⁷⁹ Patrick Kennedy, conversation with author, Berkeley, CA, 25 June 2009.

⁸⁰ Richard Brenneman, "Planners Approve Condos, Haggle over Density Bonus," *The Berkeley Daily Planet*, 30 May 2008, <<http://www.berkeleydailyplanet.com/issue/2008-05-29/article/30161?headline=Planners-Approve-Condos-Haggle-over-Density-Bonus>> (21 July 2009).

⁸¹ Gordon Commercial Real Estate Services, "Over 3,000 New Residential Units for Downtown Berkeley," <http://www.gordoncommercial.com/factbook.asp?page=new_residential_units> (21 July 2009).

⁸² Data collected from Zilpy, Zillow, <http://california.hometownlocator.com>, <http://factfinder.census.gov>, and <http://quickfacts.census.gov>; rents are current, all other data based on 2000 Census.

Using the same criteria as those described in *5.2 Location Selection Methodology*, favorable statistics for Berkeley are highlighted. With a population density almost as high as that in San Francisco, and a higher proportion of the population being in the highly-educated, young, and single category than SF, Berkeley certainly has the right demographics for developing S2. The overall favorable demographics, combined with the presence of UC Berkeley (which alone has 10,258 graduate students⁸³), Dominican School of Philosophy and Theology, and Alta Bates Summit Medical Center, ensures that Berkeley has plenty of potential users for S2. But one important question remains: With rents in Berkeley being much more affordable than those in major cities like New York City or San Francisco, is there really a need to build tiny units?

Some site-specific analysis would help answer this question. The major positive points about the site are:

- **Very Close Proximity to Supermarket & Drugstore:** For residents without a car, being able to get groceries and other necessities from a short walk away is a major advantage. Thus, the site's location two blocks away from Berkeley Bowl and Walgreens is perhaps its best selling point.
- **Accessibility to Public Transportation:** The Downtown Berkeley and Ashy BART stations are both within walking distance, and the Line 18 bus stop is right by the site.
- **Walking Distance to Institutions:** About a 10-minute walk to either campus of the Alta Bates Summit Medical Center and an 18-minute walk to UC Berkeley.
- **High Visibility:** The site's location at the busiest intersection of Berkeley gives it outstanding visibility to drivers passing by.
- **Lack of High Quality New Construction in Surrounding Area:** Much of the residential product in the surrounding area is old and often times poorly-maintained. The rarity of new construction would make S2 appeal to those who want to live in newly-built, modern buildings.

The major negative points about the site are:

- **Outside of Downtown Area:** The Downtown Berkeley Commercial District, as defined by the Downtown Berkeley Association, covers the area bordered by Channing Way to Delaware St., and Martin Luther King Jr. Way to Oxford St.⁸⁴ As the site is about half a mile south of the southern border of the downtown area at Channing Way and Shattuck Street, a resident living in S2 would have to walk about 10 minutes to enjoy the restaurants, arts and culture of the downtown community. If the site were set in the downtown area, where 319-s.f. studio apartments are currently commanding monthly rents of \$1,651⁸⁵, residents may feel more inclined to sacrifice square footage for the prime location.

⁸³ UC Regents, "Facts at a glance," 2009 <<http://www.berkeley.edu/about/fact.shtml>> (21 July 2009).

⁸⁴ Downtown Berkeley Association, "About DBA,"

http://www.downtownberkeley.org/index.php?option=com_content&task=view&id=15&Itemid=30 (21 July 2009).

⁸⁵ Rent.com, "Touriel Building," < <http://www.rent.com/rentals/california/east-bay/berkeley/touriel-building/673129/?sp=1&searchrank=3&fl=>> (21 July 2009).

- **Slightly Far from UC Berkeley:** UC Berkeley students tend to cluster around the area starting around Dwight Way. The site is about five block south of Dwight Way, which could seem far for some students.
- **Lack of Neighborhood Feel:** As the site is located right on Shattuck Ave., at a busy intersection, and is surrounded by businesses such as car dealerships, it lacks the leafy, quaint, peaceful feel that a smaller cross street off of Shattuck would provide. The area feels more commercial rather than residential.

For these reasons, the site is not an ideal one for S2. A more central location would better justify building 250 s.f. units.

Nonetheless, if Panoramic Interests takes steps to capitalize on the positive aspects of its proposed development site and mitigate the negative aspects, the current location has potential to do very well. For example, Panoramic can form alliances with UC Berkeley and Alta Bates Summit Medical Center to heavily market the product to these institutions' students or workers and perhaps offer school/employer discounts to entice them to move in. It can also put up a billboard advertising S2's LEED Platinum certification at the busy intersection to attract those who are environmentally conscious. Furthermore, if the approved mixed-use project does get built at the currently abandoned site adjacent to the S2 site, it will transform the area from a commercial district to a lively neighborhood. Thus, the 2771 Shattuck Ave. location is determined to be a fair location for S2 with a lot of potential.

CHAPTER 6: CONCLUSION

For every new product coming to the market, there is a significant amount of risk involved—and SmartSpace™ is no exception. The small, efficient unit has already proven itself in the hotel market in and outside of the U.S., but has not yet been tried in the U.S. apartment market. Highly mobile young singles in major American cities provide a potential market base for SmartSpace™. This thesis was an opportunity for S2 to test the waters before diving into the unknown.

The good news is that S2 was generally well-received by graduate students, and since the first 30 S2 units will be built in Berkeley, where more than 10,000 graduate students go to school, it should not be difficult to find 30 of them who would be interested in living in S2. The next step to take in this case is to investigate how much a graduate student would be willing to pay for an S2 unit at the 2771 Shattuck Ave. location.

S2's prospects in the young professionals market are much more uncertain. The major hurdle to overcome is the perception that it is more of a hotel than a permanent residence. In the San Francisco Bay Area where many young professionals are earning comfortable salaries and are able to afford living in larger units, it might be difficult to attract enough users for S2. Yet, the group of young professionals who took the survey—many in the technology industry, with advanced degrees—is not representative of all young professionals. It is likely that another subgroup of young professionals, perhaps in another city, would be very happy with S2—first year investment banking analysts in Manhattan come to mind. As S2 grows and expands, an important step before each new development is to conduct market studies and ascertain the existence of users in the area of a proposed site.

All in all, SmartSpace™'s combination of smart design, efficiency, modular housing, and LEED Platinum certification puts it on the cutting edge of sustainable development. These features will not go unnoticed and SmartSpace™ can very well be the start of something much bigger in the U.S. multifamily industry.

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APPENDIX A: S2 PROTOTYPE UNIT STAY—JOURNAL

Day One:

The space of the unit certainly is a lot smaller than my studio in Cambridge, but it is of a good height, so I don't feel claustrophobic. I am pretty impressed by the high quality of the furnishings and fixtures—they are of a much higher standard than the furnishings for student housing that I am used to. I don't feel that this place would work for elderly people. Getting on a ladder to put away stuff in the overhead storage space is not exactly convenient. For me, it is fine, and the ladder is provided. I put away my clothes in the drawers and the suitcase in the overhead storage. There are plenty of drawers, but not enough space to hang clothes—a real closet would be nice. Putting away my stuff clears up the floor, which was getting cluttered very quickly since the space is so small. Converting the couch to a bed was very easy and painless. So is putting it back up again—definitely better than a futon. I usually need help with a futon because the frame is so heavy.

Day Two:

The convertible couch/bed was pretty comfortable. I slept well last night. I like harder mattresses and it worked well for me—don't know how others would feel about it. The soundproof sliding door also attributed my good night's sleep. It blocked the noise of the refrigerator. I don't like having to put away the bedding and pillow in the morning and put it back on at night though. I guess that's the downside of multi-use furniture—you always have to clear the space if you want to convert it to another use.

I had my first shower experience today—didn't like it so much. There is no curtain here right now and water got all over the place, even in the groove of the sliding door of the bathroom. Even if there is a curtain, the center of the bathroom will still get wet—I would much rather prefer to have the shower on the side of the bathroom instead of the center and have something that makes sure the water does not get outside of the shower area. What was very nice about showering is that when you close the sliding door, the whole bathroom is your shower. That's about 400% more space than the shower I used in Paris where it was surrounded by glass doors and I kept bumping into them!

I invited a couple of friends to check out the unit tonight and start my survey. We watched a DVD. When you dim the lights and turn on the surround sound, S2 becomes a mini theater. I loved the experience.

Day Three:

I walked to Berkeley Bowl Marketplace to get some groceries. It's only two blocks away. This proximity to a grocery store (and a Walgreens) is probably the best selling point for the location. Otherwise, the location feels a bit too industrial. I chose to get cooked foods as I don't have the tools to cook in S2. Even if I did, the kitchen seems too small to do much cooking. It only has one burner and the counter space is minimal. It sure looks nice—kind of disappears...all you see is the sink and you don't feel like you are living/sleeping next to your kitchen, but I question how functional it is.

I had an experienced architect come in to look at the space and he was very impressed by the design. He thinks S2 is much better than the Japanese business hotels he stayed in before. A few things he liked are: the use of cork flooring for softness and absorbency of sound, the squared off corners on the ceiling, and the bamboo cabinets. He also thought that the lighting

was appropriate for small spaces. “If they used florescent lighting, people like me will go nuts!” he said. He is somewhat skeptical of manufactured housing due to code compliance issues and complications with fitting units into a building...he wishes Patrick Kennedy good luck.

I invited a couple more people to come look at the unit. They disagreed on a lot of what they liked and disliked—seems tough to please everyone!

Day Four:

Not much more to say today except that I am really appreciating the small details of S2. I love the towel heater. Not only do I not have to deal with cold, wet towels now but I am also able to quickly dry hand-washed items on it. I have not been able to get the floor heater of the bathroom to work, but I am sure that would be very luxurious as well. On the other hand, the bathroom sink is way too small! I have to hover around it to brush my teeth so that water does not jump out.

I leave in a couple of days, and I think the overall experience in S2 has been positive so far. It is a lot more livable than a hotel, and I don't mind staying here for another few weeks or so... maybe months even. The best thing about this place is that it feels high end, luxurious even...not budget. For a longer stay, I would recommend improvements to the kitchen and bathroom. This unit feels more like a hotel than a permanent living place. The actual units will be about 70 s.f. bigger than this prototype. I think I can live in that size for a couple of years, given that the kitchen and bathroom are improved.

Day Five:

My friend had a birthday party and I was able to get a lot of people from the party to come look at S2. His friends are typical of the people living in Berkeley. They are all graduate students or young professionals in their mid twenties. I fit ten people in this tiny unit at the same time! It got pretty hot but the fan helped a lot.

APPENDIX B: SURVEY RESULTS

Graduate Students:

25-year-old Asian American Male Graduate Student

1. What is the maximum time that you are willing to live in S2?

One month

2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?

- feels somewhat claustrophobic
- kitchen is small, cooks a lot
- likes having people over
- can find bigger space for cheaper

3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?

270 sf

4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?

250 sf S2

5. What features do you like most about S2?

- TV
- convertible couch
- convenience of not having to furnish it

6. What features do you like least about S2?

- SmartBench™—multi-use enough that it doesn't serve either purpose; not a good table and not a good bench
- Shower in the middle of the bathroom
- Bathroom sink too small
- How appliances are in closet
- Narrow and long shape of unit
- Partition between kitchen and appliances

7. What are your recommendations for changes to S2?

- Put partition between kitchen and desk

26-year-old Caucasian Male Graduate Student

1. What is the maximum time that you are willing to live in S2?

4 years

2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?

N/A

3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?

N/A

4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?

300 sf conventional

5. What features do you like most about S2?
 - Water draining on kitchen countertop
 - Built-in storage and lots of it
6. What features do you like least about S2?
 - How bathroom gets wet when you take a shower
 - Cooking and desk near each other; afraid work papers might get wet from kitchen
 - Feels like hotel—can't personalize or rearrange furniture
 - Halogen lights—will get hot in the summer
7. What are your recommendations for changes to S2?
 - Put stove on countertop and make pull out countertop
 - Put shower on the side instead of center of bathroom and with a groove for the water to drain
 - Make mirrors on the wall removable
 - Provide blinds/drapes

26-year-old Mixed Female Graduate Student

1. What is the maximum time that you are willing to live in S2?

Indefinitely

2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?

N/A

3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?

N/A

4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?

S2

5. What features do you like most about S2?
 - Multi-use furniture
 - SmartBench™
 - Ability to monitor energy use real-time
 - Convenience of not having to furnish it
6. What features do you like least about S2?
 - Lack of in-unit washer/dryer
 - Lack of dishwasher
 - Kitchen cabinets cannot fit certain items
 - Kitchen sink might be a bad shape
7. What are your recommendations for changes to S2?
 - At least two burners
 - Weighted shower curtain
 - Lofted bed

23-year-old Caucasian Female Graduate Student

1. What is the maximum time that you are willing to live in S2?

6 years

2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?

N/A

3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?

N/A

4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?

S2

5. What features do you like most about S2?
 - Multi-use furniture
 - Modern style
 - Convenience of not having to furnish it

6. What features do you like least about S2?
 - Second desk—not functional
 - Kitchen cabinets cannot fit certain items

7. What are your recommendations for changes to S2?

None

25-year-old Caucasian Male Graduate Student

1. What is the maximum time that you are willing to live in S2?

6 years
2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?

N/A
3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?

N/A
4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?

S2
5. What features do you like most about S2?
 - Convenience of not having to furnish it
6. What features do you like least about S2?
 - Unable to have his own decorations
7. What are your recommendations for changes to S2?
 - Make shelves adjustable
 - Provide curtains
 - At least two stove burners
 - Slide-out cutting board
 - Smarter kitchen cabinets
 - Have drawers under the bed
 - Provide hooks for hanging pots/pans
 - Provide two soap dispensers—1 for dish detergent, 1 for soap
 - Provide space for sponge in kitchen

25-year-old Caucasian Male Graduate Student

1. What is the maximum time that you are willing to live in S2?
Indefinitely
2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?
N/A
3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?
N/A
4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?
S2
5. What features do you like most about S2?
 - Convenience of not having to furnish it
 - Bathroom floor heater
6. What features do you like least about S2?
 - Stove in drawer
7. What are your recommendations for changes to S2?
 - Make more stuff that fold out of the walls

Additional Comments:

Grilling facilities and rooftop terrace suggested for amenities

Young Professionals:

25-year-old Asian Male Private Equity Analyst

1. What is the maximum time that you are willing to live in S2?
Three months
2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?
 - Size
 - Not personalized/ability to personalize limited, feels like a hotel
 - Bathroom is too small to be comfortable
3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?

300 sf

4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?
250 sf S2
5. What features do you like most about S2?
 - Smart, multi-use design
 - Lighting
 - Height of the space
 - Surround sound
6. What features do you like least about S2?
 - Small bathroom sink
 - Shower
 - Sliding doors for the storage space near the ceiling—feels like it would be difficult to fit in certain large items
 - Pull-out stove
7. What are your recommendations for changes to S2?
 - Remote for the lights
 - Put the stove on the counter space and have pull-out counter space instead
 - Change the sliding doors for the storage space near the ceiling to a different type of door, e.g. airplane overhead storage door, so it is easier to move large items in there

Additional Comments:

Would consider buying S2 a second home in a city he visits occasionally if it is in a prime, convenient location, but would not use it as a primary residence

26-year-old Caucasian Male Software Developer #1

1. What is the maximum time that you are willing to live in S2?
Three months
2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?
 - Size
 - Lack of in-unit washer/dryer
 - Lack of dishwasher
 - Tiny refrigerator; cooks a lot

3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?
500 sf
4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?
250 sf S2
5. What features do you like most about S2?
 - Modern style
 - Convenience of not having to furnish it
 - Built-in water drainer
6. What features do you like least about S2?
 - Kitchen cabinets not big enough
 - Shower
7. What are your recommendations for changes to S2?
 - More shelves in the colored built-in space area
 - Provide a safe behind one of the mirrors

26-year-old Caucasian Male Software Developer #2

1. What is the maximum time that you are willing to live in S2?
Two years
2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?

N/A
3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?

N/A
4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?

S2
5. What features do you like most about S2?
Price
6. What features do you like least about S2?

- Convertible couch uncomfortable as a couch or bed
- Bookshelves
- refrigerator

7. What are your recommendations for changes to S2?

None

25-year-old Asian American Female Patent Engineer

1. What is the maximum time that you are willing to live in S2?

One year

2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?

N/A

3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?

N/A

4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?

S2

5. What features do you like most about S2?

- Efficient use of space
- Storage space near ceiling
- SmartBench™

6. What features do you like least about S2?

- Spaces not defined
- bookshelves

7. What are your recommendations for changes to S2?

None

25-year-old Caucasian Male Patent Engineer

1. What is the maximum time that you are willing to live in S2?

One year

2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?

N/A

3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?
N/A
4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?
S2
5. What features do you like most about S2?
 - Technology details (e.g., optics, drawers don't bang)
 - Bathroom floor heater
6. What features do you like least about S2?
 - Spaces not defined
 - Kitchen sink too small
 - Refrigerator too small
7. What are your recommendations for changes to S2?
 - Reverse the kitchen/living space and nook space

25-year-old Asian American Male Consultant

1. What is the maximum time that you are willing to live in S2?
A year
2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?
N/A
3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?
N/A
4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?
250 sf S2
5. What features do you like most about S2?
 - SmartBench™

- Bathroom (as space-saving as it can; has used that kind of shower in Korea and Japan)
6. What features do you like least about S2?
 - Kitchen (cooking apparatus, lack of counter space, dish drying area is too small). “It makes you think you can cook on it, but you totally can’t.” Categorizes himself as someone who cooks moderately. “If I live in SmartSpace™, I totally wouldn’t.”
 - Not enough storage space
 7. What are your recommendations for changes to S2?
 - Make bathroom smaller (have used smaller ones in Britain) and make other spaces (kitchen and living space) bigger
 - Eliminate the second desk and make the primary working area better
 8. Additional Comments:
 - Liked Aloft hotels
 - “The hassle of checking in and out of a hotel is tremendous. If I can have my own hotel room for six months, I’m cool with that.”
 - Corporations bill hotels and corporate apartments differently. S2 should have flexible arrangements to cater to consultant types.
 - Would not buy this product as a second home. If buying a second home, it would be a penthouse in NYC or a beach house somewhere, not a S2.

27-year-old Asian Male Software Engineer

1. What is the maximum time that you are willing to live in S2?
A month
2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?
Wants more space, especially for the kitchen and closet
3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?
500 sf
4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?
300 sf unfurnished apartment unit

5. What features do you like most about S2?
 - SmartBench™
 - Door that separates living space/kitchen from rest of apartment

6. What features do you like least about S2?
 - Kitchen in the living space (will make it smell)—cooks often; currently lives in a 1 BR apartment
 - TV is set a little too high—when you sit on the couch you have to see it at an angle

7. What are your recommendations for changes to S2?

None

Additional Comments:

- Would consider living in S2 rather than hotel for extended stay visit if cheaper
- Would not buy as a second home—too small
- good for temporary stay

27-year-old Asian Female Graphic Arts Freelancer

1. What is the maximum time that you are willing to live in S2?

Six months

2. If you are only willing to live in S2 for a maximum of six months or less, what is/are the reason(s) for you not wanting to live there for longer?
 - Size
 - Not enough storage space

3. If you are only willing to live in S2 for a maximum of six months or less, what would be the minimum size of a unit if you were to live there for one or more years?

400 sf

4. If you have a choice between a 250 sf S2 unit furnished with multi-use furniture as seen in the prototype and a 300 sf conventional unfurnished apartment unit, and the location and rent are the same, which one would you choose?

300 sf conventional unfurnished apartment

5. What features do you like most about S2?
 - Bathroom—like being to shower without being in a constrained space; used a shower like this before in Japan
 - Compact kitchen—don't cook a lot

6. What features do you like least about S2?
 - Secondary desk—space limited

- Stove—don't like the pull-out, not enough space to be comfortable with the stove
7. What are your recommendations for changes to S2?
- Put the stove on the counter space and have pull-out drawer as a drawer instead

Additional Comments:

- Too small to consider buying as a second home
- Would consider renting a place like this for a weekly vacation; would prefer this over a hotel

APPENDIX C: MANHATTAN NEIGHBORHOODS



Figure C.1 Upper Manhattan

Source: Google Earth

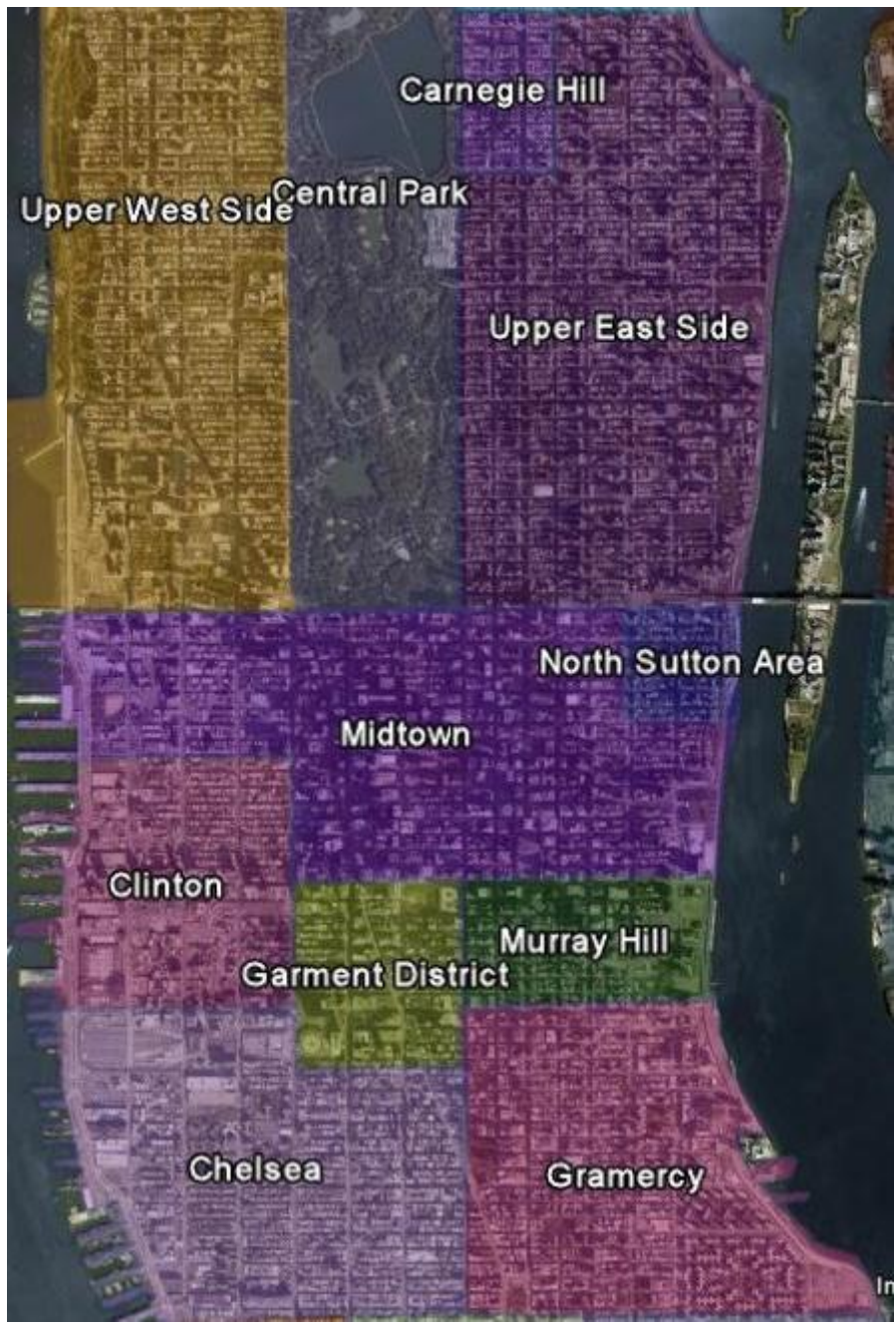


Figure C.2 Midtown Manhattan

Source: Google Earth

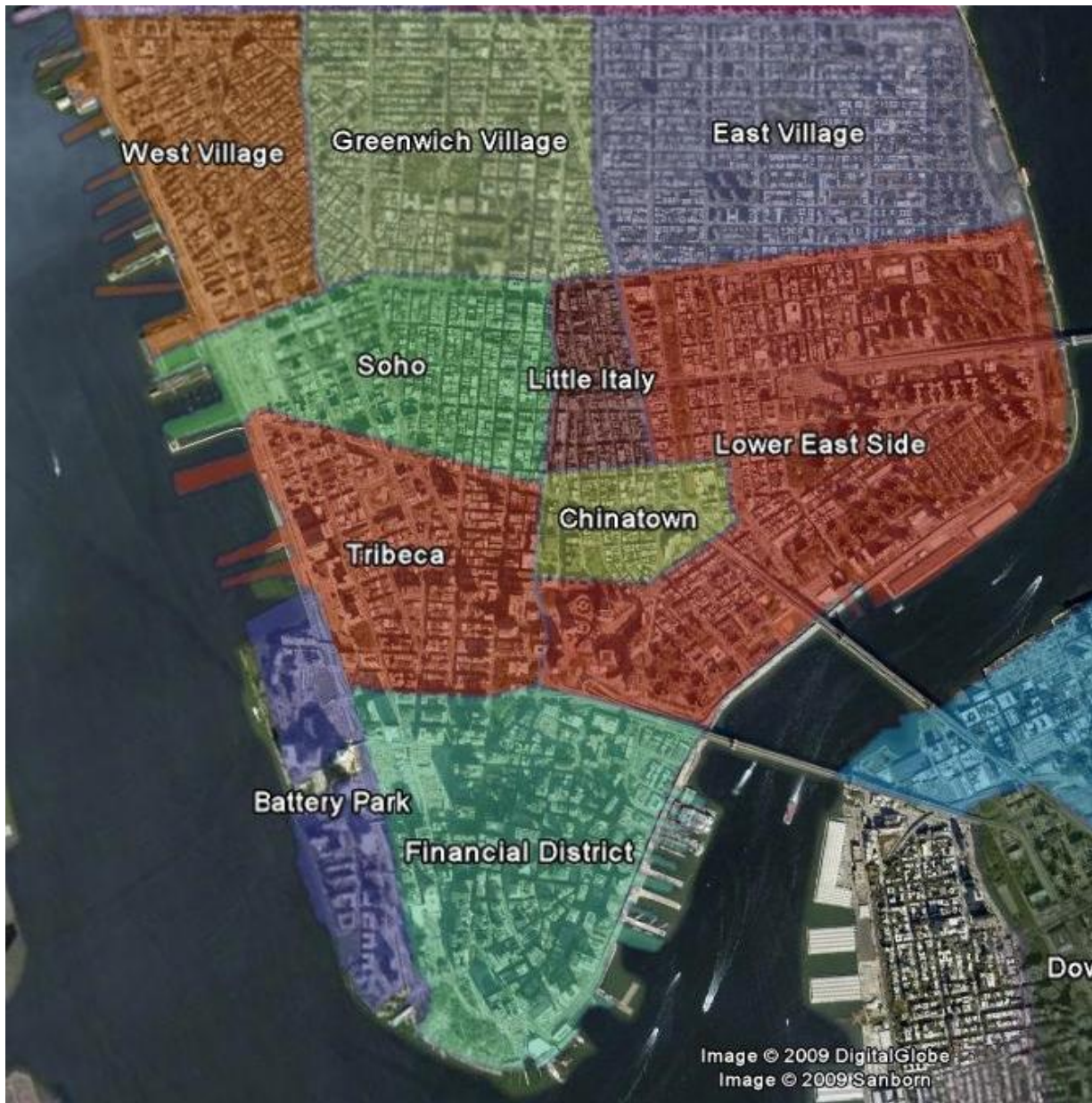


Figure C.3 Lower Manhattan

Source: Google Earth

APPENDIX D: ZILLOW PEOPLE PROFILE DEFINITIONS

Aspiring Urbanites — Urban singles with moderate income.

Low- to middle-income singles over a wide age range. Some have a college education. They work in a variety of occupations, including some management-level positions.

Bright Lights, Big City — Very mobile singles living in the city.

Singles ranging in age from early 20s to mid-40s who have moved to an urban setting. Most rent their apartment or condo. Some have a college education and work in services and the professional sector.

College Life — Students in higher education. These individuals are enrolled in college or graduate school.

People in college or graduate school.

Corporate Climbers — High-income, high-expense urban singles.

Urban singles with an up-and-coming income, but with higher-than-average living costs. Most have college educations and are employed in mid-management professions.

Elder Renters — Urban senior renters.

Retirement-age seniors who live in the city and rent. Low income. Most have a high school education or lower.

Foreign-born Urbanites — Foreign-born individuals who live in city.

Born outside the U.S., they have moved to the U.S. and live in the city. Wide age range. Some have a high school or college education, and they work in a variety of occupations.

High \$\$ DINKs — Urban high-income couples with no children.

Middle-age Dual Income No Kids couples living in the city and making very comfortable combined household incomes. Most own their own homes and are highly educated professionals, many with advanced degrees.

Golden Years — Seniors over 65 who live in the city.

Most own their own home and have a low to moderate income. Most have a high school education or lower, while some have a college education.

Makin' It Singles — Upper-scale urban singles.

Pre-middle-age to middle-age singles with upper-scale incomes. May or may not own their own home. Most have college educations and are employed in mid-management professions.

Melting Pot — Low-income, foreign-language-speaking urbanites.

Lower-income population mainly employed in service jobs. Most have a high school education or lower.

Multi-lingual Urbanites — Urban dwellers who speak more than one language.

Some have a high school or college education, and they work in a variety of occupations. Moderate to upper-scale earning potential.

Non-native Newbies — Foreign-born individuals who just moved to U.S.

A significant proportion of people who have moved to the U.S. from Puerto Rico, the U.S. Island Areas, or a foreign country. Wide age range. Some have a high school or college education, and they work in a variety of occupations.

Power Singles — High-income urban singles.

Highly educated professionals, many with advanced degrees. They draw a handsome salary and have reasonable living expenses while living a hip, upscale life in an urban center.

Shoestring Singles — Downscale, striving singles.

Struggling urban singles that are on a tight budget, making minimum wage and working in service jobs. Most have a high school education or lower and most rent.

Stable Nuclears — Higher-income urban family.

Middle-age couples with children, pulling in combined household incomes nearing six figures. Most own their own homes. Some have a college education and work in a variety of occupations, including management-level positions.

Unmarried With Children — Urban single parents.

These single parents are making ends meet with moderate income. Some went on to college, while others finished high school or lower. Most work in service, management, or professional occupations.

Urban Empty Nesters — Mature families with grown children.

Couples heading into retirement age with adult children out of the house. Comfortable income. Education varies from high school to college with some holding mid-management positions.

Urban Power Families — High-income couples with children.

Six-figure salaried couples with children who live an upscale life in a metro center. Highly educated professionals working in finance, medical, and high-tech fields.

Wise Old Urbanites — Older home-owning city dwellers in older buildings.

Middle- to senior-age urban singles who are established in their work and living environment. Most own their own apartment or condo and tend to live in older buildings.

APPENDIX E: LISTS OF INSTITUTIONS

College/University Name	Campus Location(s)
Columbia University in the City of New York	Morningside Heights, Washington Heights
The City University of New York (CUNY)	
City College	Hamilton Heights
Hunter College	Upper East Side, Gramercy
Baruch College	Gramercy
CUNY Graduate Center	Midtown
Sophie Davis School of Biomedical Education	Hamilton Heights
CUNY Graduate School of Journalism	Midtown
CUNY School of Professional Studies	Midtown
Fordham University	Upper West Side
The New School	Greenwich Village
New York University	Greenwich Village, Gramercy, Upper East Side, Midtown
Pace University	Financial District, Midtown
Touro College	Chelsea, Harlem, Financial District
Yeshiva University	Washington Heights, Murray Hill, Greenwich Village, Gramercy
Boricua College	Washington Heights
Metropolitan College of New York	Tribeca
Bard Graduate Center	Upper West Side
Cooper Union	East Village
Christie's Education	Midtown
Fashion Institute of Technology	Chelsea
The Julliard School	Central Park
Laboratory Institute of Merchandising	Midtown
Manhattan School of Music	Upper West Side
The New York Academy of Art	Tribeca
New York Institute of Technology	Upper West Side
The New York Studio School of Drawing, Painting and Sculpture	Greenwich Village
Pratt Institute	Greenwich Village
The School of Visual Arts	Gramercy, Chelsea
New York Graduate School of Psychoanalysis	Greenwich Village
New York Law School	Tribeca
Pacific College of Oriental Medicine	Gramercy
New York College of Podiatric Medicine	East Harlem
Rockefeller University	Upper East Side
State University of New York State College of Optometry	Midtown
Weill Cornell Medical College of Cornell University	Upper East Side
General Theological Seminary	Chelsea
Hebrew Union College	Greenwich Village
Jewish Theological Seminary of America	Morningside Heights
Union Theological Seminary in the City of New York	Morningside Heights
New York Theological Seminary	Morningside Heights
DeVry University	Midtown
Bank Street College of Education	Morningside Heights

Figure E.1: List of Graduate Degree Granting Schools in Manhattan

Hospital Name	Location(s)
Beth Israel Medical Center	Gramercy, Midtown
Bellevue Hospital Center	Gramercy
Coler-Goldwater Specialty Hospital	Roosevelt Island
NYU Medical Center	Gramercy
Cabrini Medical Center	Gramercy
St. Vincent's Hospital	Greenwich Village
St. Luke's-Roosevelt Hospital	Midtown
Rockefeller Institute	Upper East Side
NewYork-Presbyterian, The University Hospital of Columbia and Cornell	Upper East Side
Sloan Kettering Hospital Cancer Center	Upper East Side
Lenox Hill Hospital	Yorkville
Downtown Hospital	Financial District
Metropolitan Hospital	Yorkville
Gouverneur Hospital	Lower East Side
Harlem Hospital	Harlem
Mount Sinai Hospital	Upper East Side

Figure E.2: List of Hospitals in Manhattan

College/University Name	Campus Location(s)
San Francisco State University	Lakeshore
Golden Gate University	Financial District
University of San Francisco	Inner Richmond, Haight-Ashbury
Academy of Art University	North Beach, Russian Hill, Pacific Heights, Downtown, Financial District, South of Market
The Art Institute of California - San Francisco	Downtown
California College of the Arts	Potrero Hill, South of Market
San Francisco Conservatory of Music	Downtown
San Francisco Art Institute	Russian Hill
Alliant International University	North Beach
California Institute of Integral Studies	South of Market, Downtown
University of the Pacific Arthur A. Dugoni School of Dentistry	Pacific Heights
San Francisco Law School	Western Addition
University of California, San Francisco	Financial District, Western Addition, South of Market, Bayview, Mission, Presidio Heights, Potrero Hill, Inner Sunset, Outer Richmond
University of California, Hastings College of the Law	Downtown

Figure E.3: List of Graduate Degree Granting Schools in San Francisco

Hospital Name	Location(s)
California Pacific Medical Center (CPMC)	Presidio Heights, Western Addition, Pacific Heights
Kaiser Permanente Medical Center	Western Addition
St. Francis Memorial Hospital	Nob Hill
St. Mary's Medical Center	Haight-Ashbury
San Francisco General Hospital	Mission
UCSF Medical Center	Inner Sunset
UCSF Children's Hospital	Inner Sunset
Laguna Honda Hospital Rehab Center	Twin Peaks
Chinese Hospital of San Francisco	Chinatown

Figure E.4: List of Hospitals in San Francisco