Evaluating the Quality of the Pedestrian Environment in a Number of San Francisco Neighbourhoods

Neil Hrushowy
San Francisco Planning Department
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ABSTRACT:
Many of San Francisco's neighbourhoods are centered around retail streets lined with numerous shops, grocery stores, salons and cafés. To better understand how these streets are used, by whom and how users perceive them, the San Francisco Planning Department initiated a Public Space/Public Life study program to document the pedestrian volume and activities that occur along these streets. Over the past four years, six districts have been studied in depth using detailed maps of the physical qualities, counts of pedestrian volumes and activities, and an intercept questionnaire. The districts were chosen based on the anticipation of near-term improvements to the public realm that were meant to enhance the pedestrian qualities of streets. Planning found that despite their centrality, access to public transit and moderate to high-volumes of pedestrians, none of these centers provide the kinds of spaces or amenities that would allow them to be vibrant social centers for their communities. This paper discusses the evidence collected and the opportunities for improvements suggested by the data.

Neil Hrushowy, PhD, MS
Urban Designer
San Francisco Planning Department
1650 Mission Street, 4th Floor
San Francisco, CA 94103
USA

neil.hrushowy@sfgov.org

Biography:
Neil is an urban designer for the City of San Francisco and manages Planning's Pedestrian Program. His work includes the Fisherman's Wharf Public Realm Plan and the Northeast Embarcadero Study. Neil is leading the urban design for the Better Market Street Project, which will redesign Market Street from the waterfront to Octavia Blvd.

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The San Francisco Planning Department initiated their Public Space/Public Life studies four years ago to fill a gap in the City's knowledge of how streets work for people. At the time, there existed a large body of data on vehicles, transit and increasingly, bicycles, but almost nothing on the people who walk and spend time on our streets and adjacent open spaces.

This absence persisted despite the fact that walking is considered one of San Francisco's Transit First modes, i.e., one that is supposed to be prioritized whenever the City makes design decisions for the right-of-way. In addition to the Transit First Policy, the City has the Better Streets Policy and the Complete Streets Policy, which in various ways further emphasize the needs of pedestrians. The result was that the City had little knowledge of pedestrian needs or how best to address them. These studies were meant to fill that gap in our knowledge and to bring a new level of attention to the needs of people in public spaces.

Planning has conducted studies of seven corridors or districts, including one conducted by Gehl Architects of Denmark. The sites include: Leland Ave in Visitacion Valley, Valencia St in the Mission District, 9th Ave and Irving St in the Inner Sunset, Market St and Castro St in the Castro District, Market St from The Embarcadero to Van Ness Ave, Columbus Ave in North Beach, and Fisherman's Wharf. The majority of the sites are in what the City calls Neighborhood Commercial Districts; the streets selected represent the local retail core for the respective neighborhood (the two exceptions were Market Street and Fisherman's Wharf). In general, we have selected sites based on anticipated redesigns. To date, five of the seven sites have received some level of redesign, ranging from basic traffic calming to a complete redesign of the right-of-way. The remaining two (Jefferson St and Market St) are slated to be rebuilt by 2015. We will begin to conduct follow-up studies next year to evaluate the success of the interventions by comparing post-design data to the baseline already collected.

Methodology

The methods used have evolved slightly over time based on continual feedback and best practices in other parts of the world. Generally, the methods combine those employed by Donald Appleyard, Peter Bosselmann, and Allan Jacobs in Berkeley, and Jan Gehl in Copenhagen, Denmark. There are three formal components to the studies and include: a detailed study of ground-floor facades and the physical quality of open spaces; detailed counts of pedestrian volumes along sidewalks and stationary activities along streets and in open spaces; and a standardized questionnaire that solicits the emotional response of users to various elements of the street's design. A fourth and informal input are the numerous conversations and personal observations recorded by the investigator collected throughout what amounts to over 100 hours spent on-site conducting each study. Together, these methods allow Planning to "triangulate" answers to the sticky and interrelated questions of causality between the built environment and behaviour.

The use of all these methods is important. Simply observing people and inferring intent, satisfaction, purpose or any other aspect of beheviour can lead to inappropriate conclusions. Pedestrian volumes, for example, are not a reliable measure of successful design; rather, adjacent land uses and location of transit infrastructure are far more important than design in predicting volumes. The questionnaire and informal conversations are critical for balancing observations and for providing insight into motivations and satisfaction for the various elements that constitute the public realm, including both physical and social factors.

Major Findings

People use these streets as the community center or town common. They visit often and for a wide variety of purposes and a majority walk there. They meet friends, either by design or by chance, and they feel a tremendous amount of attachment to the place.

There are two types of streets included in our studies. The first type is the neighborhood street and we have five represented. The second type is Market Street, which is a regional destination and plays a significant role in the Bay Area's culture and economy[1]. For the pedestrian volumes, I will include Jefferson St in Fisherman's Wharf as a point of comparison. No questionnaire was employed in Fisherman's Wharf.

Physical Description

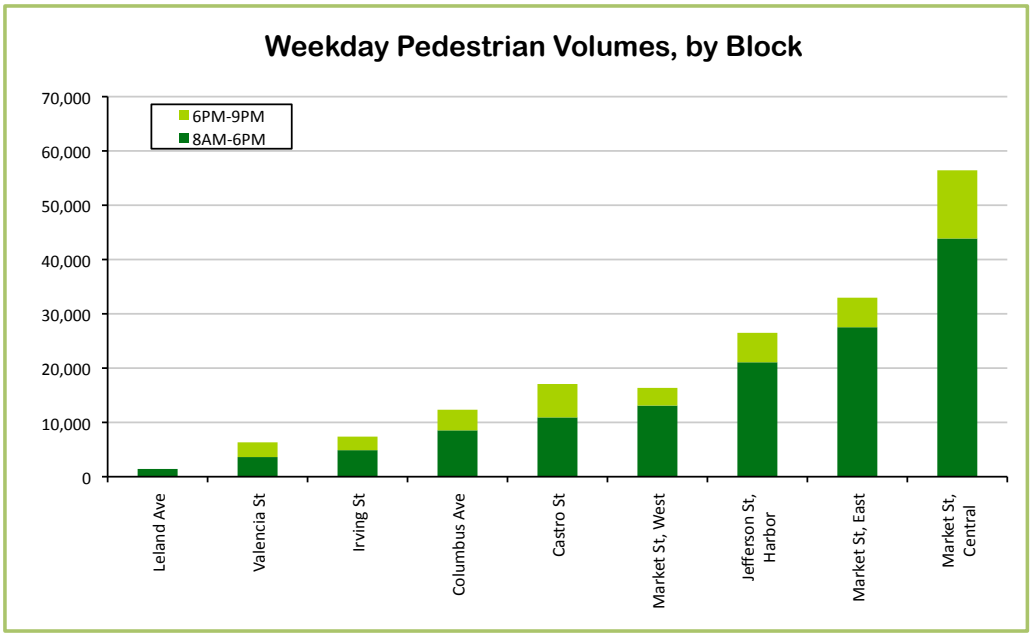
Most of these neighborhood commercial streets are located within the inner ring of older San Francisco neighbourhoods and therefore reflect a reasonably dense development pattern of two- to five-story residential buildings with narrow frontages. The two exceptions are Leland Ave and Market St, which bookend the study sites with a much lower and much higher density.

The sidewalks in the neighbourhoods tend to be narrow with few, if any, pedestrian amenities. Tree planting is sporadic and where trees exist, there is little consistency in tree species and the trees frequently suffer from a lack of husbandry. Strikingly, there is virtually no public seating, even on Market St where over 200,000 people walk on a typical day. The lighting is oriented towards the automobile, crosswalks generally are not high-visibility and the sidewalks overall are in poor condition, with many cracks and uneven surfaces. Street poles, meters, garbage cans and other street infrastructure have been placed haphazardly and reinforce a sense of cluttered neglect.

The storefronts are narrow and generally offer a variety of local-serving uses, ranging from dry cleaners to small restaurants to hardware stores to nail salons. The facades themselves tend to be worn and not contemporary in design. The store signage is cluttered and not necessarily of the highest quality materials or design.

Pedestrian Activity and Behaviour

The streets can be categorized under three levels of pedestrian activity, from low (under 10,000 per weekday) to medium (10,000-20,000) to high (above 20,000), with Central Market St at the high end at nearly 60,000 per weekday. The result on the the streets at the low end is a steady, but quiet level of pedestrian activity that never rises to the level of feeling congested, except at one or two key intersections while people wait for the light to turn. In the medium range, Columbus Ave and Castro St can certainly feel crowded during the afternoon and into the evening as peak pedestrian levels coincide with the dinner crowd, resulting in the need to carefully



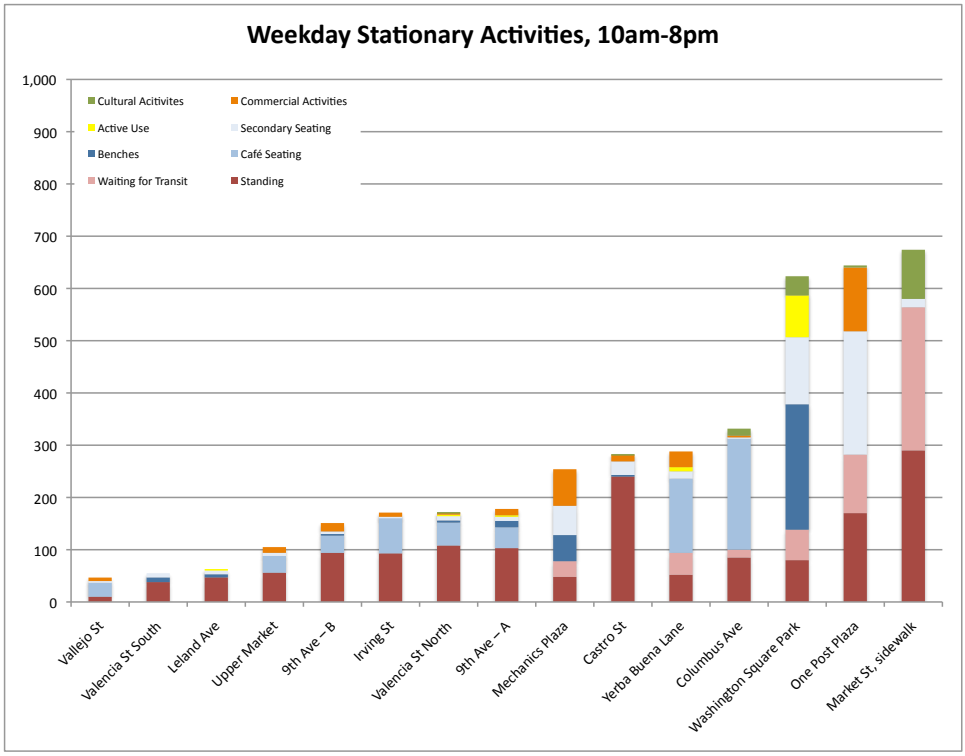
[1] Jefferson Street in Fisherman's Wharf was included in a Public Space, Public Life study by Gehl Architects and did not include an in-person survey, so couldn't be included in this part of the discussion.

navigate one's path at slow speeds. At the high end, Central Market alone ever feels crowded and only in key locations where the otherwise wide sidewalk is constrained by portals to the underground public transport, or in those areas adjacent to the cable car turnaround in Hallidie Plaza. Weekend patterns differ somewhat, with neighbourhood streets increasing modestly on Saturday, but volumes along eastern and western Market St shrinking as office and government workers are not present. Jefferson St increases nearly 300% with tourists driving this result.

Pedestrian volumes vary by time of day. During the week, Castro St, Columbus Ave, Valencia St and Irving St all have peaks or uplifts either in the late afternoon/early evening to coincide with the commute home and the dinner crowd. In general, however, these streets see relatively even use throughout the day, while Market St and Jefferson St. witness dramatic shifts from morning, to early afternoon, to evening. All segments of Market St exhibit a double peak to coincide with the lunchtime office crowd and the end of the workday crowd, consistent with other employment-focused areas. The pattern on the weekend varies somewhat across the study streets; most of the neighbourhood streets have a more pronounced peak than during the week around 3:00pm. Each of the segments along Market Street, as well as Jefferson St, have their own unique rhythm to pedestrian volumes, either peaking slightly earlier than in the neighbourhoods, slightly later, or with a double peak, as was the case with the section of Market Street closest to its terminus at the Bay.

Stationary activities tell a very different story and when overlaid with pedestrian volumes highlight some of the most problematic aspects of these streets. The data was collected throughout the day and represents the summation of hourly snapshots taken from 10am-8pm on weekdays and weekends. On Castro St during the week, for example, there were almost 300 people counted during 10 sessions from 10am-8pm. Based on these counts, we see the majority of our neighbourhood commercial streets had fewer than 200 people engaged in stationary activities throughout the day. On Irving St, for example, almost 5,600 pedestrians were counted during the same hours; this means only 3% of total visitors stopped and spent some time looking in windows, waiting for transit, sitting in a cafe or some similar activity. This is typical for the neighborhood streets, including Castro St, which is considered to have a more lively streetlife than most streets in the city. Columbus Ave, the one exception, had about 9,400 pedestrians and over 1,000 people engaged in stationary activities, which represents over 11% of visitors.

The nature of the activities recorded along the streets or in the sampling of plazas included in this study often reflect the kind of patterns urban designers would desire, even though the absolute numbers of stationary activities is unduly low. Six of the sites have at least 25% of



stationary users sitting in café chairs, a behaviour North American designers frequently associate with successful European streets and public spaces. All types of seating constitute just under 40% on both weekdays and weekends, although this average masks dramatic differences across sites. And yet, as a gross measure it suggests that a reasonably healthy balance of activities is being accommodated on these streets and plazas.

One puzzling result was the number of people "standing". Indeed, during the week, 37% of stationary activities included standing; when Standing for Transit[2] is included, that increases to nearly 50%. The pattern is less pronounced on the weekend, but the fact that one-half of stationary activities include standing begs the question, why? The addition of Waiting for Transit after the second year of these studies helps to explain a significant proportion of those standing, but a more detailed look is necessary to fully understand what is driving this number. A detailed behavioural study of a number of sites, as well as a synthesis of comments conducted for individual site reports, suggests that the lack of a place to sit for such casual behaviours as stepping outside a café to call a friend on a mobile phone or have a smoke, or just waiting to meet up with someone, cannot be accommodated in any other way because of the near total lack of public seating options. That is, the lack of public seating leaves this sizable number of people no other option than to lean against a parking meter, tree, or parked car, or to stand somewhat conspicuously in the "planting zone" of the sidewalk to avoid those walking by.

Clearly, our neighbourhood centres are not performing well as a place for people to stop, meet friends, enjoy the scene and interact with others, even as they perform reasonably well as a destination for everyday shopping, errands or dining. A cursory look at the public realm immediately explains why. Even on Columbus Ave the sidewalks are narrow and extremely crowded - well beyond the level necessary for a sense of intimacy or "buzz" that people do find attractive and comforting. Each study included a survey of the number of public seating opportunities along each street, including both primary seating (e.g., benches, seats, etc.) and secondary seating (e.g., low walls, planters, steps, etc.), and found that many streets did not provide a single public bench. There was more diversity across streets in the number of private café chairs, but again, most streets provided little more than a handful of seats.

Pedestrian Survey

The on-street intercept survey of pedestrians is meant to provide an overview of who visits the study site, how they got there, what their trip purpose was, and how they perceive the quality of the built environment. In addition to the standardized questions, there also are a number of opportunities for the respondent to provide open-ended responses; these responses often provide valuable information concerning the motivation for certain behaviours observed on the street or documented by the questionnaire. In many ways, this is information equally important as that provided by the standardized questionnaire; due to the much greater time investment required to do a careful analysis of qualitative data, we have had to exclude it from this paper. Below is a summary of the quantitative survey results.

Mode of Arrival

Overall, almost 55% of visitors walked and 24% took transit. Fewer than 15% drove, but this result is pushed upwards by the greater propensity of visitors to one neighborhood center to drive (Leland Ave in Visitacion Valley where almost 40% drove–a proportion 30% greater than the next closest study site). This is a lower-density area of the city with poor- to moderate transit and pedestrian facilities. The variation in the mode of arrival across study sites was statistically significant, with Market St and Columbus Ave registering a much greater proportion of visitors arriving by foot; that said, every study site had more than 40% of visitors walked. The greatest variations were observed in the trade-off between transit and driving, with the less-central study sites experiencing a higher proportion of visitors arriving by car than transit. Mode of arrival did not vary across either gender or residence in the city.

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2 Starting in 2009, Standing and Waiting for Transit were separated as two activities. For.

One interesting finding is that approximately only 2% respondents cycled to any of the study sites. This is consistent with the most recent commute mode share for cycling in San Francisco, but with improved cycling infrastructure receiving an increasing level of public interest, more effort needs to be made to understand how cycling could become a more attractive mode for those visiting a neighbourhood retail center. While this suggests that cycling is not yet a popular mode for the kinds of trips people make to their local neighbourhood retail center – that is, to run errands, go out for dinner, socialize, and shop[3] – given the bicycle's ability to serve short to medium distances, trips to the local neighbourhood centre seem an ideal match and the City should prioritize strengthening these connections.

Trip Purpose

Running errands was the most common trip purpose, with an average of 29% of respondents across sites listing it. Shopping, Dining and Work/Work Related[4] were close seconds, with approximately 25% of respondents listing one of them. En Route to Another Destination and Meeting a Friend were third, listed by 16-18% of respondents, while Meeting a Friend was last, listed by just under 10% of respondents. As an overall profile, these study sites offer a variety of activities, balanced across necessary and optional activities, suggesting a healthy and sustainable mix.

Looking at individual study sites, however, reveals some are more balanced than others. Leland Ave stands out as being heavily dependent on necessary trips – Errands, Shopping and En Route – which represent the majority of trips (62% of respondents were running errands alone). Valencia, the Inner Sunset and Columbus Ave were more dining-focused, while only Columbus Ave in North Beach had very few shopping trips, with only 4% of respondents there to shop. Interestingly, Meeting a Friend/Socializing was not a prevalent trip purpose, with only Columbus Ave having more than 12% of respondents indicate that as one of the purposes of their trip (21% of Columbus Ave respondents listed it as a trip purpose). The differences between sites were statistically significant at the 99% confidence level.

Comparing Trip Purpose by gender, there were no statistically significant differences between men and women. Interestingly, there were few differences in Trip Purpose across residents versus non-residents, with only Running Errands significant at the 99% confidence level; there were no differences across any other trip purpose by residency.

An important consideration during any redesign of a street is the concerns of merchants. In many cities, merchants believe the majority of their customers arrive by cars. We have found, however, that the two modes of greatest importance to merchants are walking and transit, accounting for approximately 80% of shoppers on the street, 80% of diners, and 75% of those running errands. This difference persists despite the fact that a greater proportion of people who drove ran errands. Shopping and Dining are almost identical across the three most prevalent modes. The is primarily due to pedestrians being two- to three-times as numerous as transit riders and as those arriving by car across most of the study sites. This suggests the City should invest in pedestrian improvements foremost if economic development is an important goal, and in cases where right-of-way trade-offs between vehicles and pedestrians must be made, the safer choice would be to prioritize pedestrians.

Frequency of Visits

Overall, almost 45% of respondents visited a study site at least once a day, an additional 28% visited several times per week, making these streets very important destinations in the daily lives of respondents. There was a marked difference between residents and non-residents; predictably, residents were more likely to visit at least several times a week and much less likely to have not visited at all. These differences were significant using a Chi Square test at a 99% confidence level.

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[3] This is consistent with the SFCTA's Columbus Avenue Transportation Study, which found that fewer that 4% of respondents used a bike to get to Columbus Ave (bikes were grouped with taxis and "other modes").

[4] Work/Work Related were options only for Market Street and Columbus Ave.

Looking across the six study sites, the differences were also statistically significant, with respondents on Market St and Columbus Ave more likely to visit at least once a day. Conversely, respondents in the Castro and along Columbus Ave were more likely to have not visited the study site at all the previous week, reflecting the higher proportion of tourists to those areas.

Perceptions of the Built Environment

An important element of these studies is to ask users how they perceive those qualities of the built environment that impact the walking experience and are to some appreciable degree under the control of designers. This is not to suggest that factors beyond the control of designers are unimportant – and they will be discussed in more depth in the last section – but we wanted to emphasize those elements over which the City could exert influence.

The elements included in the study are: 1) Overall Satisfaction; 2) Ease of Walking; 3) Attractiveness for Pedestrians; 4) Places to Stop, Sit and Relax; 5) Maintenance of the Sidewalk; 6) Cleanliness of the Sidewalk; 7) Safety from Vehicles; and 8) Safety from People.

One is immediately struck by the gap between Overall Satisfaction and almost every other measure. Only Ease of Walking, which is a measure of crowdedness and clutter, comes close to Overall Satisfaction. The street's attractiveness, seating opportunities, cleanliness, maintenance and safety from vehicles all receive significantly lower ratings than overall satisfaction – how can this be possible?

The Pandora Effect, or the desire to see things that one values in a more positive light, likely is in play. Indeed, previous studies have found that questions on overall satisfaction provide little information on real levels of satisfaction, but rather allow researchers to compare relative levels of satisfaction across different study sites.

There is something else at work, however. Taking Valencia St as an example, it received the highest levels of overall satisfaction amongst all study sites, suggesting it would receive similarly high scores for the various design elements hypothesized to contribute to overall satisfaction. The ratings for four of the seven possible elements (Places to Stop, Sit and Relax was not yet included in the pedestrian survey), Valencia St was either the lowest- or second lowest-rated street. What's more, it was merely average on the other design elements. This paradox and its possible explanations will be revisited later.

The overall pattern is that of a reasonably high level of satisfaction overall, but with sharply lower scores on a number of elements that bring into question what users are satisfied with. Only 25% of respondents were satisfied with the attractiveness of the street for pedestrians, for example, while over half had neutral feelings and about 15% had negative feelings. Similarly, fewer than 20% were satisfied with the sidewalk cleanliness, about 25% were satisfied with the level of maintenance, and 25% were satisfied with the opportunities to stop, sit and relax. On the positive side, the majority of respondents were satisfied with their personal safety as it relates to other people on the street; this was equally true for women as men. Perceived safety from vehicles was more mixed, with 38% satisfied overall, but those who arrived by bicycle in particular were extremely dissatisfied.

The differences across study sites were statistically significant at the 95% confidence level or greater for all the design elements included in the survey. Crowding, for example, was much more of an issue on Columbus Ave in North Beach (45% were dissatisfied with the Ease of Walking), with its relatively narrow sidewalks and numerous outdoor cafes crowding into the walking zone, as compared to Market St, which has very wide sidewalks and relatively little crowding. Similarly, Valencia received very low ratings for its pedestrian attractiveness, while Market St was perceived as designed relatively attractively. These results highlight the need for detailed and area-specific studies prior to redesign work to clearly understand which design challenges should be prioritized and which need less attention.

After reviewing the survey responses, one comes away with the sense that something more is needed to provide the full picture of how these streets function within the everyday routines of visitors. The final section endeavours to close the loop by relying on the qualitative experiences gained during each of the past four years of study.

The Sense of Place, Design and Success

The final and most difficult element to design for, but likely the most important, is the sense of place embodied in a space. We define the sense of place as the degree to which someone identifies themselves with a space. That is, the sense of place is defined by the level of emotional attachment someone feels towards a space. This attachment primarily is driven by the number of times someone returns to a space, the reasons for returning there, and the experiences they have once there. Design can play a direct and important role in the last reason, and a moderate role in the second, but only a tangential role in the first. Understanding this relationship allows one to explain why a street like Valencia, which lacks almost all elements of good urban design, remains a well-loved street by those who use it. This relationship also provides the key insight into how design can further enhance the capacity of a space to become one that can engender strong bonds of emotional attachment.

We have found that some streets have a profound sense of place, while others are almost entirely lacking. Further, the sense of place appears to be largely independent of any design criteria; the minimum level seems to be a fine-grained development pattern with varied and interesting storefronts scaled to the pedestrian. By contrast, sterility, uniformity and newness generally detract from a pedestrian's experience, but are not enough to doom a street that has other core assets. That is, density, good public transport and mixed use can compensate for sterile pedestrian design when it comes to generating foot traffic. Where either the unattractive design, inappropriate scale and lack of pedestrian amenities have the most profound effect is on whether visitors decide to linger, take in the scene, or even become part of it. We consider this last measure the most important in gauging the level of success in a street's design.

We have observed that truly great streets are achieved through a layering process applied over time, a humbling conclusion for any designer who wishes to create "great streets". It is rare to combine all the elements of a good public space in the first try; rather, a designer can sensitively add one or two missing elements that further contribute to a street's overall appeal as a destination. In this way, by making the destination that much more compelling to visit and linger, a designer can lay the groundwork for a sense of place to develop over time. This implies that the City must remain committed to an iterative design process until success is reached. The majority of streets, however deserving, rarely receive this level of attention for reasons of resources, political capriciousness and short bureaucratic memory, and our cities are testament to this. San Francisco's Public Space/Pubic Life Studies are an effort to keep public and private attention focused on the needs of our key neighbourhood streets so that at the very least the dialogue for how to improve them, when the required resources are found, is meaningful.