

HIGH VOLTAGE

URBAN ACTION

a journal of urban affairs

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a journal of urban affairs



Letter from Advisor

It is a great pleasure to write the introduction to Urban Action, the student-run journal produced in the Department of Urban Studies (DUSP) at San Francisco State University. It means that a group of talented people have completed the many challenges of producing a high-quality publication, including soliciting articles, organizing double-blind peer reviews, and managing design and production. Such undertakings often require students to learn new skills, or to further hone them. That the students manage the tasks as well as they do while taking courses and often working at outside jobs never ceases to amaze me.

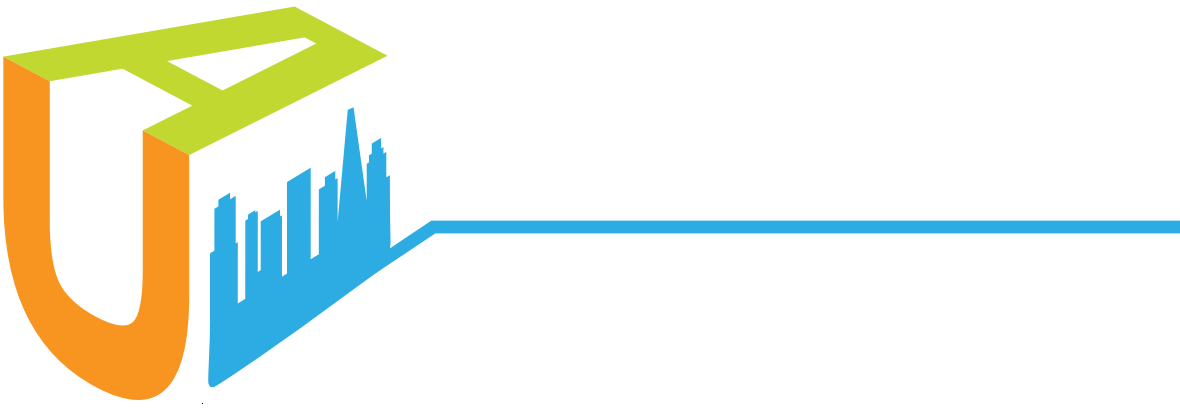
The journal is now in its thirty-third year. As with previous teams, this year's group of editors, reviewers, designers, and contributors have not just maintained the high standards that UA has achieved in the past, but have demonstrated again the impressive dedication and enthusiasm that makes the journal, and the Department, sources of inspiration. Some of the students who have worked so diligently on this year's edition will be graduating in the Spring. But some of the team will be continue, and will work on next year's issue, and in key roles. This is critical to sustaining continuity, and gives the project much needed energy - it is about an eight-month process.

I am proud of our student's work and creativity, as are the other faculty members of DUSP. The team and the journal they have produced are part of an impressive tradition, and one that produces some of the best work if its kind. Congratulations on another excellent edition of Urban Action.

Jasper Rubin

Faculty Advisor

Urban Action 2011-2012



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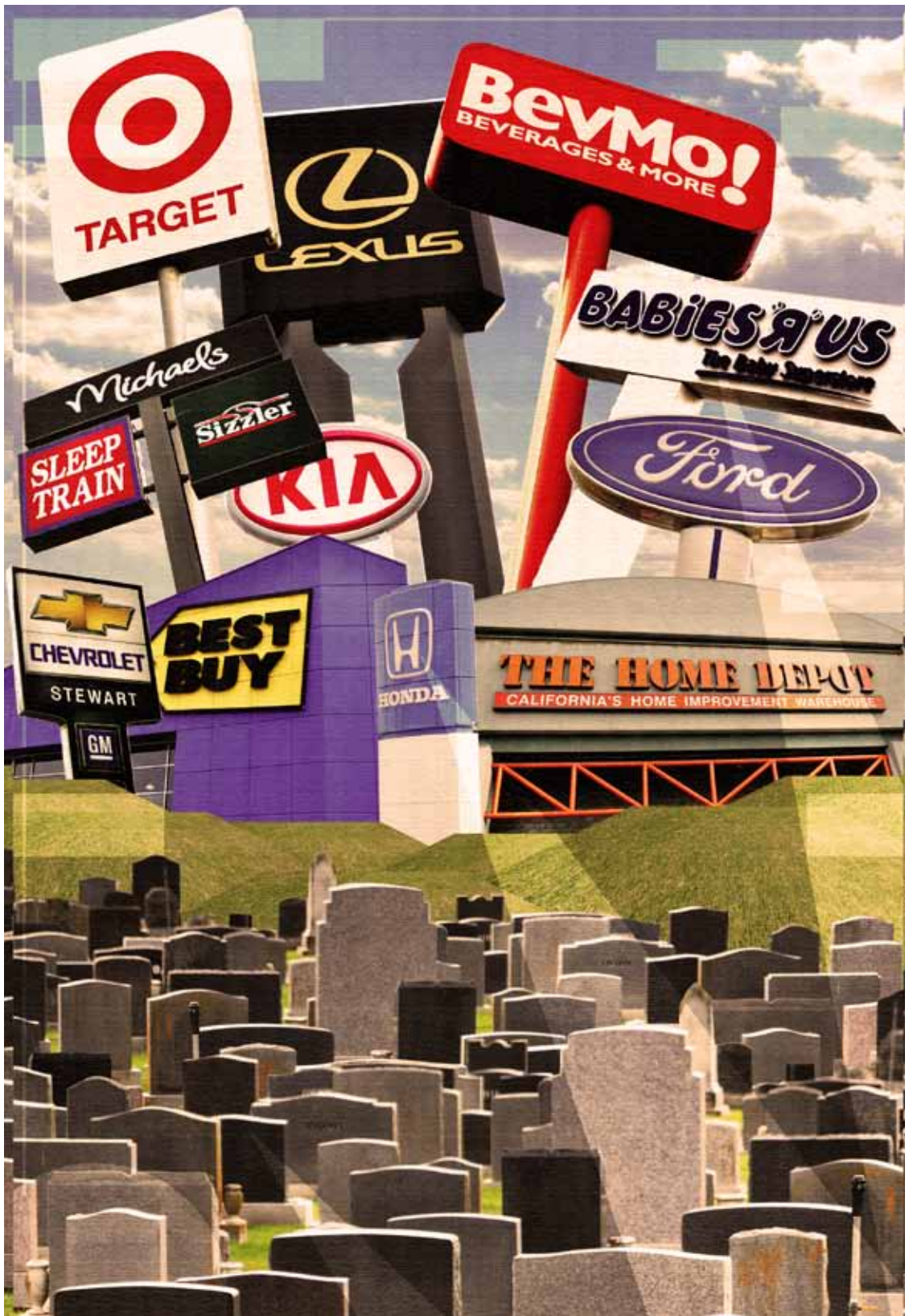
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Remora City

Victor Obeck

On an empty lot sandwiched between Home Depot, Best Buy, and yet another Home Depot, a damaged and forgotten monument stands surrounded by weeds and flowers. To the day laborers that congregate by the chain link fence surrounding the lot, the meaning of the monolith is a mystery. Nearby, incognizant Metro Center patrons pass the lot by. Yet, just beneath its surface is a mass grave: 26,000 bodies stacked atop of each other. The macabre grounds are not exactly out of place in the town of Colma. The dead far outnumber the living (a city of only 1,792) in this modern day necropolis. San Francisco, the big fish in the bay and neighbor to Colma has long ago evicted their cemeteries, which happily found a home across the border in this remora fish city. It is the story of these silent cities that often goes untold. The neglected bones in the mass grave having been exhumed and moved up to three times since they were first left to “rest in peace.” To tell their story is to tell the story of Colma and the history of cemeteries in San Francisco.

FRONTIER CEMETERIES

During the Gold Rush era of San Francisco, many Californians and Natives were laid to rest in the cemetery adjoining Mission San Francisco de Asís (Miller 2006) but for most their final resting spot was wherever one saw fit. As a result of indifference or necessity, ad-hoc cemeteries sprung up throughout the city forming an archipelago of graveyards. In an attempt to channel this into the formation of legible cemeteries, California made it law that any plot of land with more than six bodies laid to rest in its soil be declared a “public” cemetery. In North Beach, what started as a random burial in 1847 near present day Washington Square soon became the resting place for 900 souls (Miller 2006). Nearby, at Sansome and Vallejo, another cemetery spouted up (Myrick, 2001).

Soon after gold was discovered and the “lights came on” in California, San Francisco began expanding rapidly. When John Geary was elected the first mayor of San Francisco in 1850, he inherited a city already in debt. Lacking enough money for “a single police officer” or to even bury their “unfortunate strangers” (Richards, 2009, p. 132), Geary used the selling of city real estate to raise capital for the incipient metropolis. William M. Eddy, a recently arrived drunk, was hired to double the number of lots laid out by the original city surveyor Jasper O’Farrell just two years prior. Nearly every parcel of land laid out by O’Farrell in 1847 had been sold, including 444 lots that were not even terra firma (Richards, 2009). At the edge of town Eddy laid out Yerba Buena Cemetery, a 13-15 acre triangular tract of land bounded by Larkin, Market, and McAllister street (Proctor, 1950). Eddy boasted that the cemetery would be “sufficient to accommodate the dead... for the next half century” (Miller, 2006). The cemetery would only prove sufficient for a decade. None of the “gold rush cemeteries” that existed in Wild West San Francisco could be found on Eddy’s map. Presumably, the land was sold and the bodies removed to Yerba Buena. Telegraph Hill cemetery that was removed to make way for blasting to create ballast for commercial ships (Myrick, 2001). The legality of this is questionable as California law made many of these lots official cemeteries regardless of ownership.

As quickly as souls poured into San Francisco, they did so into Yerba Buena as death was rampant in the frontier city. Illness and disease ravaged the population and medical care was rudimentary. “Dead carts” hauled corpses from local hospitals to a potter’s grave in North Beach and then later to Yerba Buena. For those who wished for a proper burial, it cost nearly \$100 which was more than many forty-niners could afford. Often fraternal organizations and benevolent societies helped bury the dead who lacked social capital in this city of immigrants (Richards, 2009).

As the proverbial shit-rolls-down-the-hill, cemeteries in Victorian America were pushed to the peripheries of cities as many feared they would spread contagion (Shelton, 2008, p.28). This is not to say that one does not find cemeteries at the center of many American cities, but these are often there because they are attached to a church. San Francisco had an old church with an attached cemetery as well, but it would not be found at the center of the city. San Francisco was built around the church of commerce and the port was its temple. When Archbishop Joseph Sadoc Alemany moved the

“What started as a random burial in 1847 near present day Washington Square, soon became the resting place for 900 souls.”

headquarters of the Archdiocese to San Francisco 1853, he did not station himself at the old Mission Church, but rather a new Church built closer to the economic heart of downtown. Alemany also recognized the limitations of the Mission's small graveyard of approximately 2 acres (83,600 square feet) that already housed over 5,000 (Griffin, 1950) and oversaw the formation of Calvary Cemetery.

Looking to take advantage of San Francisco's newest export, dead bodies, two developers and an undertaker joined forces and bought 320 acres of inexpensive land far from the developed city. In 1854, they opened the Lone Mountain Cemetery (later Laurel Hill Cemetery). From their large tracts of land, two other cemeteries were carved out: The Mason Cemetery later that year in 1854 and Calvary Cemetery in 1860. Another fraternal organization, the Independent Order of Odd Fellows (I.O.O.F.) would also purchase land nearby (Shelton, 2008). These four cemeteries (long known as “The Big Four” of the cemetery industry) were located outside the city limits in an area called the “Outside Lands”, then considered a wasteland of shifting sand dunes and harsh winds.

Meanwhile, the city continued expanding and Yerba Buena Cemetery was no longer at the edge of town. The neglected graveyard had become an eyesore and the city felt the best solution was to once again raise the dead. The bodies were moved to Golden Gate Cemetery, located in what is now aptly named “Land's End” in San Francisco. Yerba Buena Cemetery was then parceled up; plots fronting Market Street were sold and the remaining land set aside for civic buildings (Shelton, 2008).

THE POTATO PATCH

When Patrick W. Riordan became the second Archbishop of San Francisco in 1884, he inherited a debt of \$600,000. Riordan, who had a reputation for being a good “fund-raiser”, quickly went to work raising capital. A year later, the church broke ground on the “new” Saint Mary's Cathedral (Burns, 2000). In the years that followed, the church made several poignant land transactions that would shape the future of Colma and San Francisco. Calvary was of less use to the church as a cemetery than as real estate and unused portions of it were parceled and sold off. The Catholic Church also acknowledged the city had extended its borders to merge with the county; it was once again time for cemeteries to be pushed back to the outskirts.

Activities that were pushed out, banned, or unprofitable in San Francisco were often picked up with vigor by the unincorporated Colma district; a land of farms, gambling halls, foul smelling pig sties (Svanevik & Burgett, 1995) and a tannery (Unknown, 1883). Directly across the border from San Francisco, the area was originally much larger than today (including John Daly's farm). A sort of border town, Colma was a collection of businesses and establishments along the major artery of the peninsula, San Jose Road (later known as El Camino Real). It was along this route that the Southern Pacific Railway traveled, making it accessible to the city. When San Francisco outlawed prize fighting, Colma began a decade's long tradition of hosting many boxing matches after “Sunny Jim” Cofforth moved his prize-fighting operation south of the city. For years, Colma would be infamous for its many fights as well as an entire culture of gyms, trainers and up-and-coming boxers (Svanevik, et. al., 1995).

It was here in Colma in 1887 that Archbishop Riordan acquired a large potato patch and blessed it as a burial ground; it was never consecrated for fear that it too someday would be moved (Svanevik, et. al., 1995). This would become the Catholic Church's third cemetery: Holly Cross Cemetery. Riordan had reservations about the cemetery, fearing it was too far from the city. Still he must have had enough confidence in the city's growth to know that going outside its boundaries would be the best solution in the long term. Shortly after starting the new cemetery, the Church sold off part of it to the Congregation Emanu-El which in turn developed the land into two Jewish cemeteries. What today is Dolores Park was once Home of Peace and Scherith Israel (Bancroft, A.L. & Co., 1873). The two Jewish cemeteries had been priced out of expanding so they sold their sacred land and funded the transportation of their dead to a larger burial ground in Colma (Svanevik, et. al., 1995).

In 1894, Golden Gate Park opened officially. It was a major investment by the city in its western frontier and signaled a commitment to the developing of the "Outside Lands" (Shelton, 2008). Stakeholders in the Richmond neighborhood viewed the cemeteries as a lebensraum and argued that with land prices rising, they must be stopped from further impeding the city's progress (Shelton, 2008). Pro-development groups found a voice in Mayor James D. Phelan who wanted to re-invent San Francisco as a great city. A proponent of the City Beautiful movement, Phelan hired architect Daniel H. Burnham to draw up plans for a Haussmannian re-imagination of the city. Under Phelan, the burying of the dead in San Francisco became illegal on March 25, 1900 with Ordinance No. 25 (Shelton, 2008). Once again, Colma was there to reap the benefit as six new cemeteries were inaugurated over the next seven years following the passing of this law. The pieces were in place now for San Francisco's greatest eviction; the removal of all its cemeteries.

"Under Phelan, the burying of the dead in San Francisco became illegal on March 25, 1900"

NECROMANCING THE CITY

In 1902, Vincent Whitney and Jack Neville (the future landscape architect of Pebble Beach Golf Links) received permission from San Francisco's Park Superintendent John H. McLaren to transform part of Golden Gate Cemetery into a golf course. The location's dramatic background was ideal for this increasingly popular Scottish sport. The original course was just three holes, but over the years it would continue to expand (Lincoln History, n.d.). That any bodies were removed to make way for this golf course is highly unlikely. The city officially got out of the cemetery business when in 1908 the Board of Supervisors voted to remove all the dead and turn Golden Gate Cemetery into a park. The following year the city handed the land over to the Parks Commission (Miller, 2006), which expanded the golf course and turned more land over to the expansion of Fort Miley (Lincoln History, n.d.). The city removed the headstones but whether any bodies were actually removed is debatable, as "no records exist" (Lopez, 2004). Once the burial ground for the indigent, Golden Gate Cemetery is now Lincoln Park; an 18-hole golf course and the western terminus for America's first highway. In 1921, the construction of the California Palace of the Legion of Honor began and workers quickly encountered the remains of bodies left from an earlier potter's field. Ironically, the building was dedicated to those who had lost their lives in The Great War.

In 1994 during renovations, nearly 800 bodies were found under the main courtyard beneath Rodin's The Thinker (Lopez, 2004).

The 1900 ban of burials in San Francisco was the first nail in the coffin for the "Big Four". Within forty years all four cemeteries would no longer exist, having moved their dead to Colma. The ordinance banning burials had left the cemeteries unable to raise money as they no longer could sell plots of land. The Masons and the I.O.O.F. quickly invested in Land in Colma to continue on their traditions. Sadly, the Board of Directors embezzled the money raised to care for the Odd Fellows Cemetery (\$50,000) and the cemetery was renamed Greenlawn Memorial Park (Svanevik, et. al., 1995). Buried in this cemetery is James "Sunny Jim" Rolph, the mayor who oversaw a period in San Francisco's history most hostile towards cemeteries.

Just two years after Rolph took office in 1912, the Board of Health issued Ordinance No. 2597 declaring the nostrum that cemeteries were a "public nuisance and a menace and detriment to public health and welfare" (Shelton, 2008, p. 38). Later that year Proposition 50 asked San Franciscans to allow the city to force the closure and removal of the remaining cemeteries. The proposition however was defeated (Shelton, 2008). For the Masonic and Odd Fellow cemeteries, they were losing money on their cemeteries and after the embezzlement of funds, the I.O.O.F. no longer could care for the upkeep of the cemetery. These organizations wanted to close and sell their land but were bounded by the individual plot owners (Shelton, 2008).

"There they erected a monument atop a mass grave which defiantly stated "Interned here are the remains of remains of 39,307 Catholics moved... by order of the San Francisco Board of Supervisors.""

In 1921, the State passed the Morris Act which allowed cemetery associations to remove graves and sell land as long as a majority of plot owners consented (Shelton, 2008). The act was immediately attacked in court (Hornblower v. Masonic Cemetery Association) and Proposition 43 was placed on the 1924 ballot to keep the cemeteries. Now at odds with the Masons and the Odd Fellows, the Catholic Church and Laurel Hill Cemetery were fighting against removal. The two huge cemeteries feared the cost of removal would be too much for them to bear and thus supported Proposition 42. Against it was the Chamber of Commerce, the San Francisco Real Estate Board and of course, Mayor Rolph, who was quoted saying that "sentiment must yield to progress" (Shelton, 2008, p. 42).

The proposition won and the cemeteries lived another day, but in 1930 a court decision was reached allowing cemeteries to remove their dead at the request of a health ordinance. Wasting no time, the Masonic and the Odd Fellows Cemeteries moved to Colma the next year. The I.O.O.F.

sold their land to be developed as housing and unceremoniously moved the dead to a lot in the Greenlawn Cemetery. The Masons had purchased land in Colma in 1904 and created Woodland Memorial Park. They moved their dead there and then sold their land in San Francisco to Saint Ignatius College (later University of San Francisco). The sale of land from the Masons to the Catholic Church was symbolic of the time with Mayor Rolph, a Mason with close ties to the Catholic Church (Burns, 2000). His associations to the Church and Archbishop Edward Joseph Hanna must have been somewhat strained though as the Church had no interest in moving their cemetery citing that the cost was too great for them to bear. In 1937, under a new mayor and archbishop, the city again moved to deracinate the final two cemeteries. The Catholic Church, no longer willing to fight, consented and removed Calvary to Colma (Shelton, 2008). There they erected a monument atop a mass grave which defiantly stated "Interned here are the remains of remains of 39,307 Catholics moved.... by order of the San Francisco Board of Supervisors."

The last holdout was Laurel Hill. The largest of the cemeteries, the Laurel Hill Cemetery Association feared that the financial burden of moving all their dead was too great. They pleaded with the city to transform the area into a park (Shelton, 2008). The idea being that they could remove the headstones but not have to remove the bodies with the hope that they could turn the land over to the city for free and be spared from having to care for the bodies anymore (Proctor, 1950). The city declined and in the end, it went to a vote. In 1937, San Franciscan voters approved the removal of Laurel Hill with a vote of more than two to one in favor (Shelton, 2008).

On October 6, 1967, a funeral procession snaked its way up from Haight Street to Buena Vista Park. The funeral party consisted of Hippies and the casket filled with memorabilia and trinkets memorializing the "summer of love". The event was called a funeral for "hippie" and was an ironic take on the what many saw as the death of the hippie movement that was being co-opted by commercialism. Many in attendance that day were unaware that as they dug a hole and lay their ceremonial coffin to rest that they were in full view of Lone Mountain now completely gone of any trace of the nearly 100,000 graves (Proctor, 1950). What little remained could now be found under the feet of those spectators. The thousands of monuments and grave markers from Laurel Hill had been offered to relatives and historical societies, but few wanted them. Instead, they were turned over The Department of Public Works who used them to build sea walls at Aquatic Park, lay the foundation for the municipal yacht harbor (Shelton, 2008) and pave the rain gutters along the walkways of Buena Vista Park.

CITY OF THE DEAD

When the last of the redwood boxes were buried at the mass grave in Cypress Lawn, the city of Colma was then called Lawndale and it was barely twenty years old. The concentration of cemeteries had created a new industry of the dead with many rushing to capitalize off it. It started when Holly Cross opened in 1887. That year the Southern Pacific Railway began operating a daily "funeral train." 50 cents took a mourner to Colma and for a dollar more a casket too (unless the deceased was a victim of smallpox, diphtheria or yellow fever). The San Francisco & San Mateo Electrical Railway also

"The last hold-out was Laurel Hill... The largest of the cemeteries, the Laurel Hill Cemetery Association feared that the financial burden of moving all their dead was too great."

got into the corpse transportation business too offering a cheaper (albeit slower) option (Svanevik, et. al., 1995).

Sculptors and monument makers too came to Colma, with the one of the earliest being Donohoe & Carroll. They set up shop adjacent to the entrance of Holy Cross (Svanevik, et. al., 1995). Across the street from them was Brooks & Carey Saloon (still in operation to this day as Malloy's) which served the many Irish immigrants who were there to turn a potato farm into a cemetery (Svanevik, et. al., 1995). Soon more cemeteries had moved to Colma to take advantage of these economies of scale and more workers came to compete for jobs. Many were of Irish decent, but not all; Gaetano Bocci and his brother Leopoldo Bocci ran competing businesses making monuments. While their work could be found throughout Colma, much of their work can be found in The Italian Cemetery and not in Holy Cross.

The Società Italianna di Mutua Beneficenza had long been caring for and burying indigent Italians and continued this tradition with the Italian Cemetery. Despite being Roman Catholic, San Franciscan Italians did not closely associate with the church, which was dominated by the Irish community (Burns, 2000). Originally, the Italian society maintained a portion of the city owned Gold Gate Cemetery. While the city cemetery served the purpose of a potter's field, many organizations curated sections so that their destitute members were given a proper burial. As a result, the cemetery was broken up into a wide array of ethnic sections. Around the time that Golden Gate Cemetery closed, many ethnic societies took advantage of the cheap land in Colma and moved there. In 1899, the Italian Cemetery & Mausoleum opened in Colma. Two years later the city saw the addition of Serbian, Japanese and Jewish Cemeteries (all in 1901). Other organizations may not have had the funds to continue burying its members. While there were six Chinese burial plots in Golden Gate Cemetery, Colma would not get one until 1988. When the San Francisco city cemetery officially closed in 1908, most destitute were probably buried in Sunset View Cemetery in Colma, a paupers' graveyard dating from at least 1907. The fate of this field was ironically another golf course. Thousands of simple wood grave markers were neglected and finally removed to turn Sunset View into Cypress Hills Golf Course (a ball hit into a neighboring graveyard is considered out of bounds) (Svanevik, et. al., 1995).

By the time Colma officially became an incorporated city (then called Lawndale, the second choice after Memorial Park) on August 4, 1924 it had prospered greatly by being just across the border from San Francisco. Land values rose by 2,900% as a result of the improvements brought on by the formation of the cemetery complex. A cottage industry of cemetery related services had also benefited. From stained glass artisans to flower farmers Colma was succeeding as a cemetery complex. However, the organization made up of 14 Colma cemeteries known as Associated Cemeteries feared for the region's future. The pressures that had evicted cemeteries in San Francisco would soon exert themselves on Colma. The surrounding area had recently incorporated as Daly City and the City's population was rapidly advancing towards them.

Mattrup Jensen had an idea. Known as "the father of (Colma)", Jensen came to Colma as a landscaper of Cypress Lawn Cemetery and

then became the superintendent of Mount Olivet. A smart politician, Jensen led a campaign supported by the Associated Cemeteries to incorporate a city that would exist solely as an aegis for the cemeteries. To ensure that the cemeteries had the power to control the city government, Jensen drew the new town lines specifically to exclude residents. Businesses too were purposely excluded with the city boundaries excluding the commercial district of Colma. Once incorporated, Jensen was elected Mayor and a town council was formed with the intention that each major cemetery would have a representative serving. The Town Council would meet in an administration building at Cypress Lawn Memorial Park. Holly Cross, Cypress Lawn, Greenlawn, Woodlawn and Mount Olivet each provided one person to become a deputy (Svanevik, et. al., 1995). Jensen would remain the mayor of Colma, off and on until World War II. During this time the minuscule population of the city actually decreased but Jensen's interest was in making the city work for the cemeteries and enjoying having his own city. Jensen sketched the city hall and famously would commandeer a streetcar for the private use of his family, taking it into San Francisco via the Market Street Rail Road line (Svanevik, et. al., 1995).

THE MONUMENT AND THE BIG BOX

For decades, the city of Colma focused its attention on the cemeteries, vehemently opposing housing or unrelated businesses (Svanevik, et. al., 1995) despite the fact that all around it returning veterans were rapidly developing Daly City and the unincorporated parts of Colma into a "ticky-tacky" suburban paradise. Colma's low population (it remained under 600 until the 1980s) allowed city leaders to practice cronyism (see Appendix). The cemeteries paid no taxes and the city had little need for money. The only major road in town was a state funded highway. Public transportation was provided by Muni and the Southern Pacific Railroad. In the late 1950's Interstate 280 was built on the town's border, but "storage city" had trouble ahead. A declining death rate, changing attitudes about cremation and the soaring costs of burials began to take their toll on the industry (Landis, 1989).

In 1971, negotiations between the Gravediggers and Green Attendants Local 265 and the Colma Cemetery Association broke down and resulted in a walk out (AP, 1971). The strike, which lasted for four months while 1,800 bodies piled up (Rubin, 1985), was devastating for the cemetery economy of Colma. Business never picked back up as fewer people chose to be buried and turned to cremation. Newer generation had little interest in visiting grave-sites and when they did, synthetic flowers were replacing the need for flower shops. The cemeteries began to react by looking for alternative ways to raise money. That same year of the infamous strike, the first of what would be many car dealerships opened on Serramonte Boulevard and soon after a shopping center would be developed on land partially owned by a cemetery (Hatfield, 2011). Fifteen years, and three more strikes later, the Gravediggers union had lost over 40% of its membership (AP, 1971) and the town of Colma was entering a new phase with an economy built on sales taxes.

Awash in a new source of income, Colma rewarded its residents with box seats to 49er games, all expenses paid parties at the finest hotels



“Colma rewarded its residents with box seats to 49er games, all expenses paid parties at the finest hotels in San Francisco and summer picnics with free transportation.”


in San Francisco and summer picnics with free transportation (Svanevik, et. al., 1995). City Manager Frances Liston was a driving force for Colma growth. Under her direction, the city expanded its borders (nearly doubling its population) and embarked on a series of commercial developments (Svanevik, et. al., 1995). As land became a premium in the Bay Area, Liston became miffed with Colma’s rejection of growth. “I don’t know how we can say no to every project... You have to say yes at some point” (Landis, 1989).

Yes was exactly what the Colma Council board said to Rene Medina, a former cock-fighter, who wanted to build a casino (Russell, 2007). Not everyone in Colma was pleased with the idea, as the city of Colma has long been anti-casino. Medina was able to drum up support in the small town by beguiling its residents with free trips to Reno and the Monterey Bay Aquarium. Soon after Lucky Chances Casino opened its doors, it became the most successful non-Indian casino in the state and was providing Colma with nearly a third of its \$14 million dollar income. The casino also brought the attention of the Federal Bureau of Investigation which indicted two venal council members and found that Medina had evaded nearly \$1 million in taxes (Russell, 2007).

As one drives from Daly City into the town of Colma along Clark Avenue, the border is obvious. The road suddenly is paved with brick, quaint lampposts line the streets, and utility lines are absent. The residents on this street enjoy free cable and a yearly sewer fee of just one dollar (Hatfield, 2011). The town has recently built a new building

to house the Historical Association as well as a new police Station. Yet Colma has no school, library, or public transportation system. Most services are provided by San Mateo County. With a population still under 2,000 people, the town was never meant for the living.

Once Colma was devoted to the cemeteries, now it caters to businesses. Many of the cemeteries have followed suite. Woodlawn Memorial Park, home of the Masonic mass grave site, was sold to Houston-based Service Corporation International (SCI) which operates in excess of 1,800 cemeteries, funeral homes and crematoriums. SCI has set about increasing its profit (the company earned a profit of \$126 million in 2010) by drastically cutting the wages of gravediggers (Jones, 2011). Local 265 again had to strike in 2011. Across the street, Greenlawn Cemetery used part of its land to build the town's second Home Depot. The mass grave of the Odd Fellow brethren buried besides the Home Depot has been a thorn in the side of the cemetery owners for some time now. Unable to do anything with the land, Greenlawn fenced it off and now use it to store equipment for the grounds and allow an immigrant family to grow flowers on it.

The monument and the box store exist in an uneasy alliance; two different faces of Colma. The few locals that exist do their best to give Colma a legacy, but mostly it is without one. At different times, it has meant different things to people. Always existing as the remora fish trailing behind San Francisco, the town re-invents itself to survive off whatever the City does not want: gambling, professional fighting, BART rail yards, trash dumps, over two million dead bodies, and Home Depot. 

APPENDIX: COLMA DYNASTIES

Name	Years Mayor
Charles Gerran	1982 – 1983, 1986 – 1987, 1990 – 1991, 1994-1995
Dennis Fiscaro*	1991 – 1992, 1994 – 96, 1999 – 2000
Helen Fiscaro*	1997 – 1998, 2001 – 2002, – Current
Earl Taylor	1956 – 1958, 1964 – 1965, 1969 – 1970, 1974 – 1975
Frossana Vallerga*	1998 – 1999, 2002 – 2003
Richard Vallerga*	1981 – 1982
Rena Vallerga*	1960 – 1962, 1966 – 1967, 1972 – 1973
Philip Lum	1988 – 1989, 1992 – 1993, 1996 – 1997, 2000 – 2001
Raymond Ottoboni	1954 – 1956, 1958 – 1960, 1965 – 1966, 1968 – 1969, 1970 – 1972, 1978 – 1979, 1983 – 1984
William Newall	1926 – 1928, 1932 – 1934, 1936, 1940 – 1942
Cornelius Newell	1928 – 1930, 1934 – 1936
Matstrup Jensen	1924 – 1926, 1930 – 1932, 1936 – 1940

*Relative of another Mayor.



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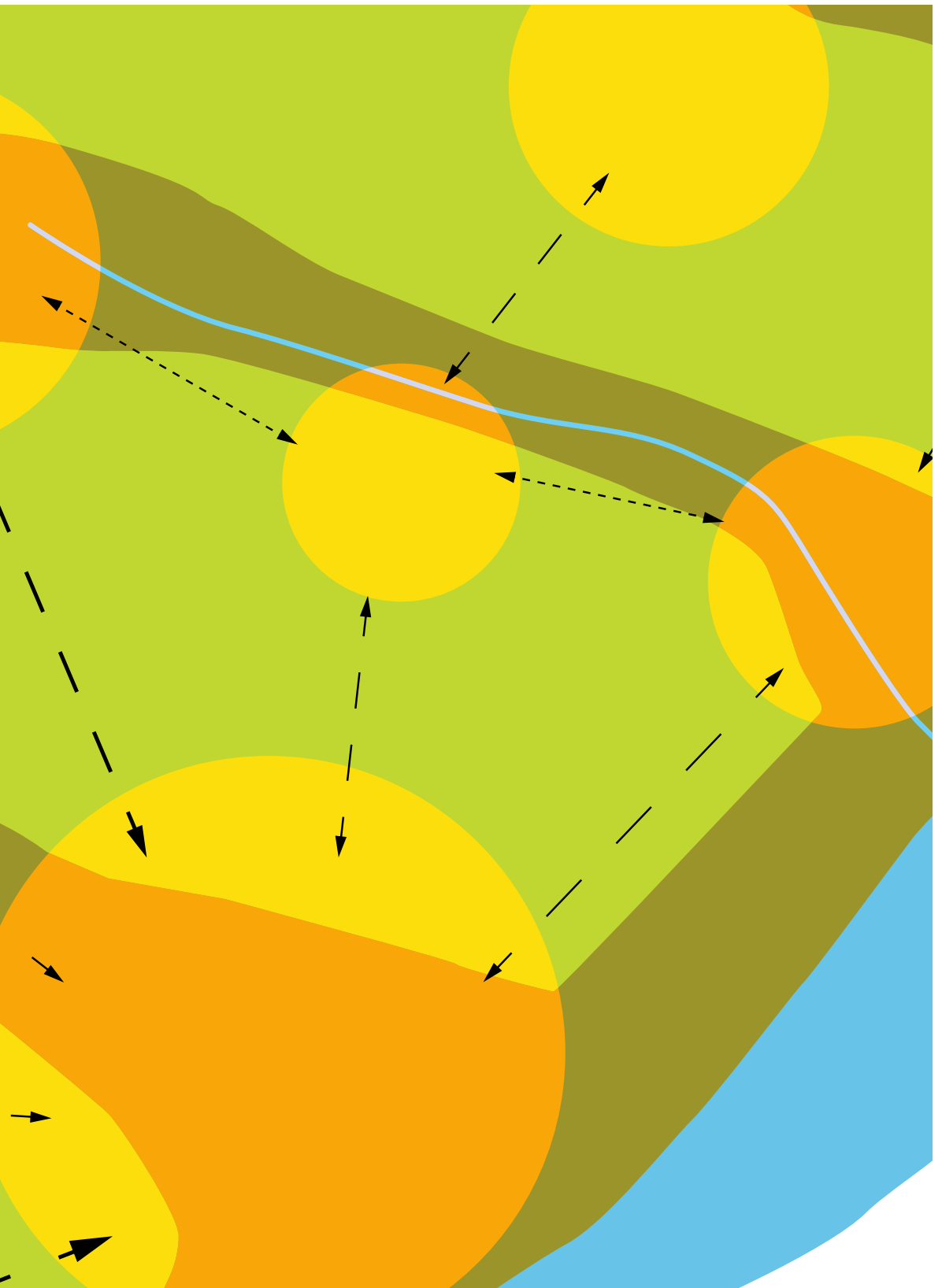


Urban Renewal in Detroit

Implications for Future Developments

Alicia Pisani

No city currently in America captures the mind like Detroit. It is often times at many centers of urban discussions. With its history of being a premier American city in its hay day and it's collapse, symbolizing the collapse of industrial America to its modern day attempt to be reborn. The history of Detroit's urban renewal starts in the the era of urban redevelopment funded by the federal government to its modern day adaptive approach to shrink it's size. The following piece will take you through the journey of Detroit's fall and it's struggle over the last half of the 20th century and into the present to rise back from the ashes. The insight and facts presented in the following pages will put forth the story and ask the question if Detroit has the ability to become the American Phoenix city. The city that rose again.



Having lost 61% of its population since 1940 or 1.1 million residents, Detroit, Michigan finds itself in need of a new vision to be successful for future success. (Census) Once a busy and bustling industrial center during WWI, WWII, and the American automotive industry in the early 1990s, Detroit is now an example of America's industrial decline and urban decay. Detroit experienced a major loss in population and urban deterioration starting in the 1960s. (Boyle) Before the downfall appeared imminent to Detroiters, the city leadership attempted to overcome old, blighted and tired neighborhoods in the city by instituting urban renewal policies. The policies were used as a tool to increase property values, bolster flailing tax revenues from slowing industries, and to increase the quality of life for residents. (Erneccq)

Urban renewal in late 1940s Detroit was seen as a great tool to increase investment and opportunity for the city and its residents. However, this was not the case for all Detroiters. Urban renewal initiatives "... failed egregiously to serve the needs of most of the city's residents, some whom were forcibly evicted from their homes." (Goodspeed 1) Urban renewal had the greatest impact on poor, working class, minority citizens who made up the majority of the blighted and dilapidated neighborhoods chosen for redevelopment. Urban renewal ended up permanently displacing residents, increased white flight and further fueled racial tensions between the city's white, immigrant and black populations. Sixty years later, no longer the industrial powerhouse it once was, Detroit is now home to small sectors of professional services; 750,000 residents, large amounts of "urban prairie" space, and tens of thousands of vacant, abandoned and dilapidated homes. (Renn) Urban renewal policies instituted and carried out in the 1940s and 1950s will impact Detroit in the envisioning of itself because of the removal, displacement, breaking up of communities, cultural and socioeconomic issues indicated by uprooting entire neighborhoods to "right size" Detroit for the future.

Urban renewal was a large-scale, post WWII federal program that embarked upon a mission to clear slums, improve the lives of residents, and gain tax revenues by infusing large amounts of funds to the local level. Areas targeted for urban renewal, "... were considered health and safety hazards-breeding grounds for disease and social disorder." (Fulton 261) The main motivator for an area to be targeted under redevelopment was if it was a slum that contained large amounts of blight. Blighted slums were "... run-down buildings, dirty streets, and a high crime rate that was almost exclusively inhabited by poor people," therefore creating "a social liability to the community." (Pritchett 16) Cities and municipalities around the country began to bulldoze, evict and raze entire neighborhoods. Established neighborhoods would find themselves replaced by new high-rise housing projects, commercial zones, public amenities and homes. By the 1970s, urban renewal had run its course and was no longer seen as a tool for urban improvement. (Pritchett)

The motivation for urban renewal came in November of 1941 with the Federal Housing Administration's, A Handbook on Urban Redevelopment for Cities in the United States. This (report?) was created in response to cities requesting help with "municipal rehabilitation and redevelopment" to counter urban slums and blight. (Foard 636) The recommendations made by

the FHA were to create local forms of governmental agencies or corporations with the powers to “acquire, hold, and dispose of real property for redevelopment, including the power to acquire sites through eminent domain.” The FHA suggested that the option of federal funding should be considered to ease localities transition into renewing their urban landscapes. In 1949 the United States Housing Act was enacted, allowing the federal government to bestow powers and money to the State in order to create local agencies. These agencies in turn, would use the redevelopment tool of urban renewal to proceed with slum clearance. (Foard 636) The leadership of Detroit saw this as an opportunity to restore blighted areas and create a world-class city. (Foard)

Urban renewal policies in Detroit started a decade before the FHA published its ideas about how to increase revenues and clear the social ill of blight. In 1928 the Detroit City Plan Commission stated that they needed to do something about the “small income group” who live in “intolerable” areas of Detroit. (Erneq 2) The Commission did not state exactly how the slum conditions would be rectified, only that they existed. In 1933 the City of Detroit created the Detroit Housing Commission in order to facilitate the

City	No. Rented (1950)	No. Rented (1960)	Median Rent (1950)	Median Rent (1960)
New York	9,232	3,529	\$35.50	\$127.50
Chicago	5,994	4,281	47.50	109.50
Philadelphia	973	436	28.50	58.50
Detroit	1,119	337	28.00	152.00
Baltimore	957	862	29.00	152.00
St. Louis	84	107	20.00	97.50
Boston	885	0	20.50	n.d.
Cincinnati	929	868	16.50	40.50
Kansas City	3	0	35.00	n.d.
Newark	1,118	400	23.50	42.50
Birmingham	581	18	13.50	41.00
Rochester	771	652	29.00	54.00
St. Paul	851	189	23.00	43.00
Norfolk	4,629	2,545	14.00	37.00
Syracuse	43	58	52.50	61.50
Providence	1,054	28	17.00	30.00
Nashville	509	0	12.50	n.d.
Hartford	316	0	19.00	n.d.
Little Rock	164	124	25.00	41.50
Harrisburg	532	0	20.00	n.d.
Binghamton	311	55	27.50	52.50
Chester	147	10	29.50	40.00
Mean	1,406	659	\$25.50	\$64.00
Total	30,932	14,499		

Table 1: Major U.S. Cities Rental Unit Costs (1950-1960)

redevelopment and rectify the slum areas of the city exacerbated by immigration and segregation. In conjunction with Detroit's Master Plan, Five years of studies and research went into the neighborhood patterns of the city. In 1938

The Detroit Housing Commission presented a ten-year plan to reduce and reuse slum areas and to clear them out for better uses. The city embarked on this plan with private enterprise and developers to financially fund the redevelopment. (Erneq) WWII put a damper on actions to move forward with any plans until 1946 when The Detroit Plan was announced. The Detroit Plan was focused on retaining residents in the city, many of whom were leaving as part of "white flight," after the war and to put an end to urban blight. Industries also began leaving Detroit city proper and taking their workers with them as well. (Black) The city would take the financial burden on by itself financing it through higher returns of future taxes. In 1947 the Detroit Plan was passed and adopted. The Detroit Plan was still being implemented when the Federal Housing Act of 1949 would come into place, and fund two-thirds of the redevelopment area Detroit was working on, known as the Gratiot project. (Erneq)

After a few political changes and concentration on industrial areas of the city, in 1950 Detroit was focused upon a 129-acre area in the eastern part of downtown called the Gratiot project, which was housing 7,000 people in an area nicknamed "Black Bottom". The project took 14 years to come into completion, and it changed the entire neighborhood completely by razing the entire Black Bottom neighborhood and replacing it with several freeway junctions and modern high-rise living spaces geared toward the middle class. The Gratiot project marks the beginning and the end of redevelopment projects in Detroit over its 14-year lifespan. It is also the most studied and looked at urban renewal area of Detroit because of its massive breadth and importance to the central city. (Goodspeed)

A study conducted by Jonathon Staples of the University of Hawaii in 1970 analyzes twenty-two cities that instituted urban renewal policies and the impacts they had on populations. It should be noted that the twenty-two cities that responded to requests for information are the only cities included in his research evaluation. Through his research, Staples found that "only 18 percent of the substandard housing in the United States is found in cities with the population over 100,000." (Staples 294) Most of which were populated by poor black and immigrant residents. Pair this with Detroit's renewal plan and this proved to be extremely detrimental to the original residents of the Black Bottom because the neighborhood maintained a strong base of mostly Black renters. In 1950 there was 120 owner occupied units and seen in table 1, the Gratiot project had 1,119 units for rent in 1950 before demolition processes began. Renters were be evicted from their homes with no compensation, while owners received small portions of the actual value of their homes. (Goodspeed 52-62) As of 1960, although completion did not happen for four more years, there were only 337 units for rental. Eventually out of the 1,300 finished units, 400 would be available for rent. (Erneq) The Gratiot project Black Bottom area in 1950 had a median monthly rental price of 28 dollars per month. After 1958, when the first units were completed, the median rental price was 15 dollars per month, the highest of all urban renewal projects across the country in Staple's study. The resulting buildings of redevelopment are called the Lafayette Cooperative. Dominated by

"After 1958, when the first units were completed, the median rental price was 15 dollars per month"



Image 1 (Left), Image 2 (Right)

Large Photos (Hadidi), Inset (Detroit News)

international modern style themes, they were created by the architect Ludwig Mies van der Rohe. (Goodspeed) They are a series of low-rise condominiums (image 1) surrounded by residential towers (image 2) opened in 1964. Where Lafayette Park stands now was once a thriving African American cultural center for the Detroit area. The Black Bottom originally had hundreds of businesses, clubs, restaurants, churches, and amenities that disappeared with the old neighborhood. (Erneq)

Detroit's relationship with the socioeconomic impacts and effects of urban renewal are represented by relocation, dispersal and insurrection of its residents. Once residents were evicted, or their homes sold under eminent domain, they generally ended up in other slums or in the suburbs. The residents that stayed in the city "... helped spread blight to other areas of the city as slum residents were displaced." (Widner 51) Most of the displaced residents could only afford living in other slums, and this intensified the housing issues in other slums as their populations began to rise beyond their capacity. (Erneq) This situation was further fueled by the fact that in the late 1950s there was a severe housing shortage in Detroit's black community. Resentment and tension began to build between Detroit's black and immigrant populations as they were competing with each other directly in the housing market. (Goodspeed) Matters worsened when black and immigrant residents' insurrected against their government and police powers, torching a large amount of the city and rioting against the establishment for days. Successfully having created further fuel for white flight to the suburbs, the uprisings left the city "blacker, older, and poorer" throughout 1970s and 1980s. (Walters 67)

Current day Detroit residents have a growing issue to face. Geographically, they reside in a city originally stretched out to fill the needs of 2 million residents, but they are only 750,000 people as of 2010. (census) Detroit currently maintains "100,000 parcels, private and public are vacant," and only 38% of Detroiters work inside of city lines. (Davey 2) Economically, the entire former industrialized city of Detroit, developed similarly to other industrial cities that "developed so that not only their physical environment, but their institutional and civic attitudes as well were oriented almost totally toward the industries that had supported them in the past." (Widner 54) This reliance on an industry that no longer exists in a powerful capacity has left Detroit crippled to deal with its own fate. Detroit no longer has the support of

the automotive industry that built it. Socially and socioeconomically Detroit “is the only city in the nation where single parents head the majority of families, and Detroit is more segregated than any other major metropolitan area.” (Boyle 110) Detroit has also been losing jobs at a record pace for a large city, at around 5 percent a year since the 1970’s. Couple all of the geographic, economic, and social ills together and you have a city that is in need of a plan for the future to maintain itself. A future, of a city more condensed, stronger and better equipped for the challenges that lie ahead in the rest of the 21st century. (Boyle)

Wendy S. Walters of the Art Center College of Design in Pasadena, California initiated a qualitative and anthropologic study that embodies the forward thinking of Detroit. “The Strategy for bringing the future to Detroit has not proved fruitful for its residential communities.” (67 Walters) By studying the Heidelberg neighborhood of eastern Detroit, Walters finds that people want to see a better future and are willing to use their “hard-core” work ethics and “can-do” attitudes to help out. The Heidelberg Project (image 3) was a long running art installation created by Heidelberg resident Tyree Guyton in order to highlight the history and impact American society has had on industry and culture. In dilapidated, vacant homes dotting the neighborhood, Tyree collected “worn cloth, leather, vinyl shoes,” and other throw away items from vacant lots to assemble installations that highlighted the lives no longer living in the homes barely standing in a once thriving neighborhood of Detroit. (Walters 65-70) The plight of Detroit is not that the city does not want to move forward, it just does not know how because past renewal and redevelopments were not inclusive of the residents and communities that mattered.



Image 3: The Heidelberg Project

Urban renewal was not the answer for solving every socioeconomic issue a large city may face. Renewal policies focused on the built environment and the impact improving the vision of seeing blighted areas could have on a city’s residents. As residents were displaced out of their neighborhoods, they took their communities with them. Most residents never returned. Urban renewal had not considered the human element in redeveloping areas.

Detroit can embrace its future to the full extent if it creates itself anew in a leaner and meaner way. Detroit has neighborhoods of vitality stretched miles out from each other with several homes and microneighborhoods inbetween. The areas where microneighborhoods and single homes dot the landscape resemble an urban prairie of single 1900s farmhomes, multiple family low-density dwellings, urban gardens and vacant expansive lots. The organic development and shift of residents has made a heavy burden fall upon infrastructure, basic city needs and services. Collecting garbage, repairing pipes and maintaining dilapidated roads across vast distances is not an easy feat for an expansive city without the resources and time to do it. Pair the declining infrastructure with poor tax revenues from industry and the extreme decline of residential property values in Detroit and reducing the physical size of the city makes fiscal and budgetary sense. (Davey) The issue holding everything back is how to make people realize that moving

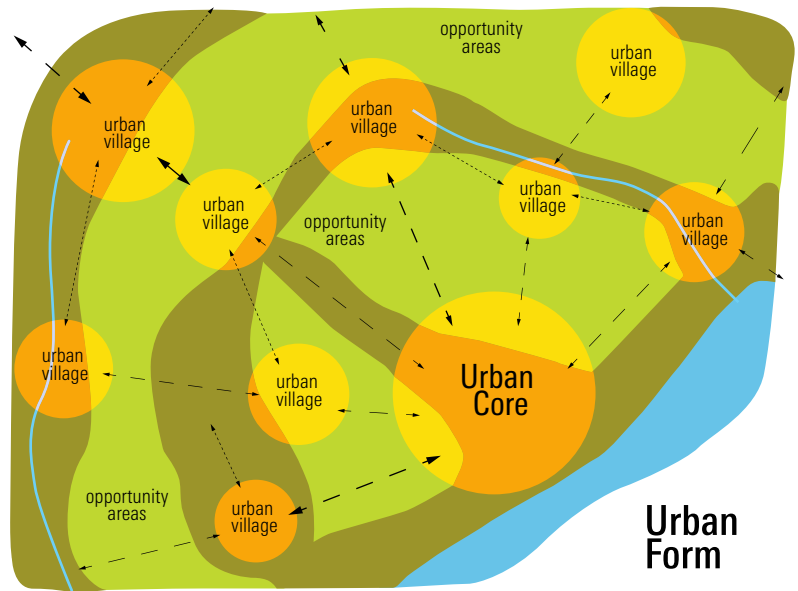


Image 4: A Diagram Explaining the Concept of the Shrinking City.

into urban villages and into other areas of the city makes sense. There are no urban renewal eminent domain powers to force people to move, however Detroit's Black Bottom removal and the eviction of poor black and immigrant residents still lies in the minds of many Detroiters. (Davey)

The future plan of Detroit lies in the shrinking cities movement where Detroit would melt down over time to urban villages with a major economic urban core (image 4). As NewGeography explains it,

"One natural response is the "shrinking cities" movement. While this has gotten traction in Youngstown and Flint, as well as in places like Germany, it is Detroit that provides the most large scale canvas on which to see this play out, as well as the place where some of the most comprehensive and radical thinking is taking place. For example, the American Institute of Architects produced a study that called for Detroit to shrink back to its urban core and a selection of urban villages, surrounded by greenbelts and banked land." (Renn)

Mayor Dave Bing has made it his mission, since elected in 2009, to "rightsize" and shrink Detroit so it is viable for the future. It will be a process that spreads over decades, as Detroit no longer has the urban renewal policies available to them as they had in the past. This requires the city to incentivize living in the urban village areas without leaving the microneighborhoods behind. Proposed incentives such as building new homes and having people "trade" their homes, tax credits and improved services have been mentioned, but nothing thus far has passed. This sets up a challenging predicament because most people in the microzones are averse to leaving and are demographically at a socioeconomic disadvantage compared to their urban village area counterparts. The current deputy director of the city's planning and development department, Marja M. Winters finds that balancing the needs of the community and the needs of individuals is a very fine balance and

declares that, "It's all very hard. There's so much weighing on it, we just can't afford to mess up. We've got to get this right, right now." (Davey 4) Planners in Detroit must tread carefully as to not hurt the current communities of residents by evoking similar policies of urban renewal that affected the poor, black and working class citizens of earlier industrious Detroit.

The implications of urban renewal policies will have on the future development in Detroit have the potential to have outstanding effects. In shrinking Detroit, attention should be paid to the improvement of public areas. "Particularly schools, parks, play grounds, parking facilities", access to food and basic needs. (Levi 356)

"The problem of urban renewal in Detroit has not been that there has been too little, or even too much, but rather there has been too much of the wrong type: large projects which ignores the needs, desires, and skills of the residents they displace. Cities are not simply accumulations of physical infrastructure or concentrations of money, but rather fundamentally organic ecosystems of human life. (Goodspeed 66)"

Planners and administrators must not operate under the assumption that new regulations and programs to improve the city will solve all problems Detroit faces. It is important to take into account the role of social planners in the process of rebuilding by not "ignoring human aspects and people concerned" in the future. (Erneq 19) Too many urban renewal plans in Detroit and elsewhere ignored everything but the built environment and the bottom line of increased tax revenues.


Urban renewal's past in Detroit must be paid attention to when developing plans for urban villages and the central core: not only for the negative consequences on the populations displaced, but also to incorporate the good and lessons learned from the projects as a whole. It was not that redevelopment happened through urban renewal policies; it was how it was enacted and carried out. Through past processes, planners and administrators must incorporate people in the process and be increasingly sensitive to the needs of all of their citizens. 





Photo by Paul Hitz
<http://www.flickr.com/photos/paulhitz/873662102/>

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Minimal Surfaces as Urban Forms

Ramon Hernandez

As the world moves towards a more urban society, cities become a major attraction for the development of new physical structures. It is important that cities continue to investigate new and innovative methods of adaptation, in an effort to mitigate and solve the problems produced by urbanization. Design is fundamental to solving urban problems. Through the exploration of minimal surfaces as urban forms; affordability, potential space, and eloquence in design can be maximized while simultaneously enhancing greener environments, material efficiency, and public safety.

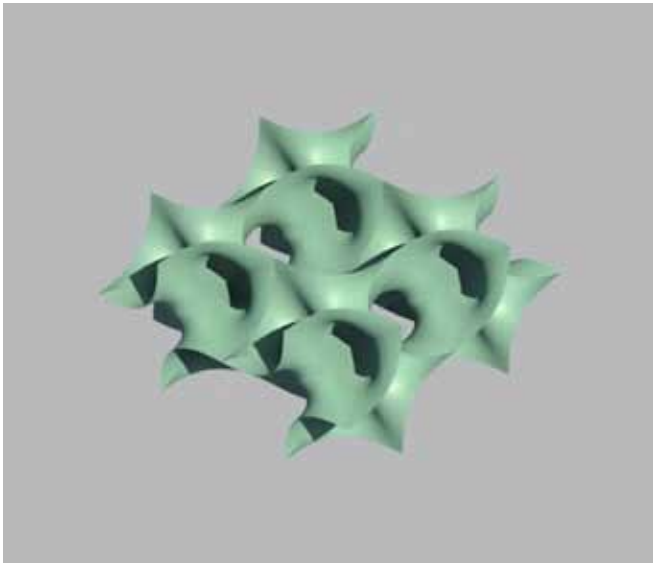
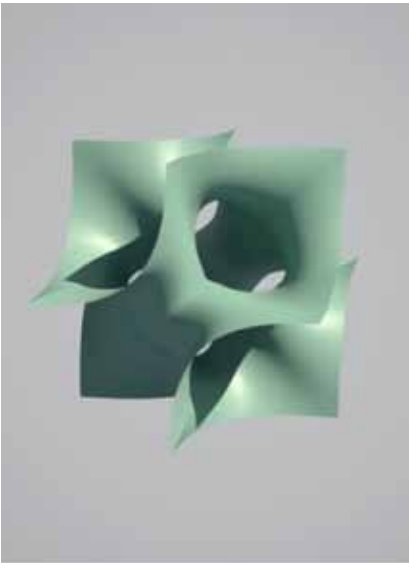


Figure 1: Batwing tile formation. *Complied by author.* Figure 2: Batwing. *Complied by author.*

Triply Periodic Minimal Surfaces, often referred to as minimal surfaces, are three-dimensional modular forms that derive from complex mathematical equations. Just as the circle and its area derive from a specific equation; minimal surfaces also derive from studies of more complex equations. The importance of minimal surfaces lies in their natural qualities to obtain the maximum amount of space through the most minimal amount of surface area. One of the simplest ways to approach the formation of minimal surfaces is to think about the natural formation of soap films. For instance, if we were to “dip a metal wire-closed curve into a soap solution, when we pull out, a soap film forms. A nature solves a mathematical question of finding a surface of the least surface area for a given boundary. Among all possible surfaces soap films find one with the least amount of surface area” (Kostic, D., Stankovic, M., Radivojevic, G., Velimirovic, L, 2008, p. 89). Of course, there is a strong mathematical background behind the natural behavior of soap films that relates to surface formation of minimal surfaces. The pragmatic mathematics behind minimal surface formation establishes the credibility for mathematicians and engineers to practice their real-life applications. Thus, “minimal surfaces are extremely stable as physical objects, and this can be an advantage in many kinds of structures. From architects point of view, computerized illustrations of some minimal surfaces are intrigued by the possibility of adapting them to structures, both interior and exterior” (Kostic, D., Stankovic, M., Radivojevic, G., Velimirovic, L, 2008, p. 90).

There are many minimal surface forms ranging from different “families” and types. The particular focus of this exploration will be solely examining, mathematician Alan Schoen’s, “Batwing minimal surface” as a prime example. One of the natural wonders of these forms is that they begin in the form of standardized tiles. As shown in Figure 1, the fundamental Batwing unit can be derived by a set of simple geometrical pragmatic steps. These steps include the simple creation of cones and planes from lines and parameters within the cube. The manipulations of such tiles also lead to

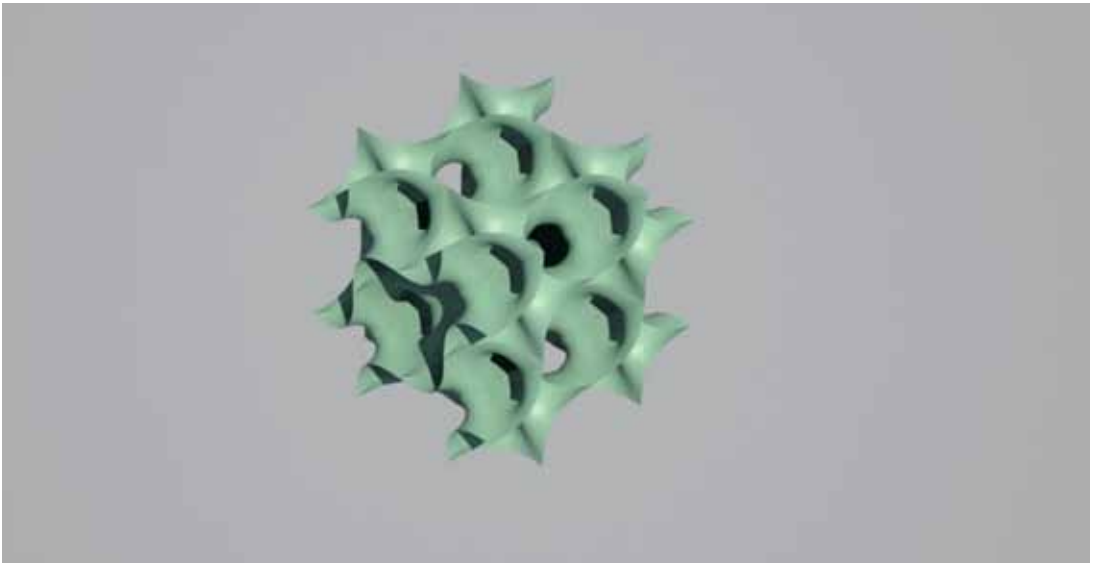
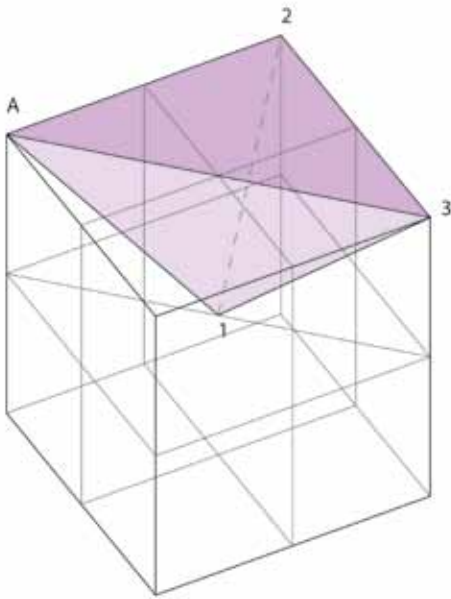


Figure 3. Bating horizontal modular replication. *Compiled by author.*

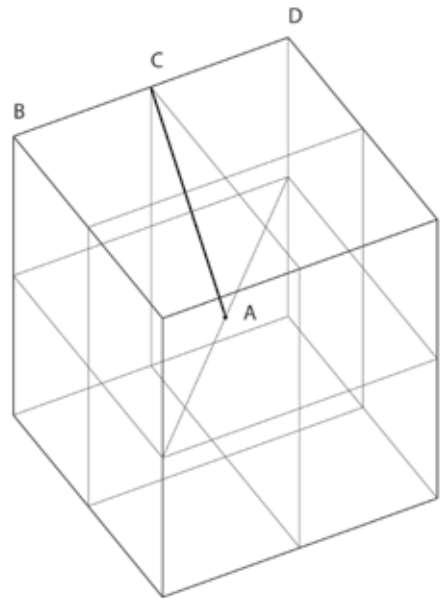
astonishing complex and complete forms. The final batwing form is displayed in Figure 2. Such forms can change in scale or transform in shape. One of the most significant characteristics of minimal surfaces is their abilities to act like cubes that can be stacked and connected in multiple directions. This characteristic can be seen in Figure 3 where a basic batwing unit is replicated in a horizontal direction and then in Figure 4 the modular system is replicated in a vertical direction.

Minimal surface units are infinite in their replication and connectivity. By nature they induce the proximity of unique spaces. The curvature of the Batwing form allows for the creation of maximum amount of spaces from the most minimal amount of surface area occupied. The regressive sections of the Batwing form described in Figure 6a and Figure 6b illustrate the spaces created by the forms curvature in a direct elevated view. From this view, we can also see how minimal surfaces, such as the Batwing, form a perfect cube.

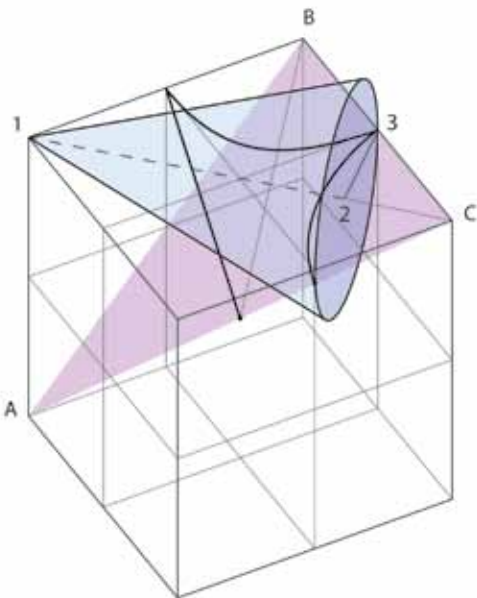
The creation of spaces calls for an extensive look into how minimal surfaces contain the potential to become architectural units. The proximity of these units is a unique characteristic of minimal surfaces that is important when exploring greener urban environments. American journalist and author, David Owens, gives insight into the actual environmental innovations of the city in his book *The Green Metropolis*. Here, David Owens argues that density and proximity of urban environments produces greener cities, and this is due to several factors. Owens strives for “living smaller, living closer, and driving less.” Dense environments encourage people to live smaller and living smaller means less space. Owens describes that “oversized, under occupied dwellings permanently raise the world’s demand for energy, and they encourage careless consumption of all kind” (2009, p.46). The densities of cities require smaller living conditions and therefore encourage the reduction of necessities to produce a more sustainable life. Minimal surfaces can be a method to encourage such an urban lifestyle. As an urban form, the nature of the minimal surfaces, as a modular system, encourages the innovation of strategic architectural living units.



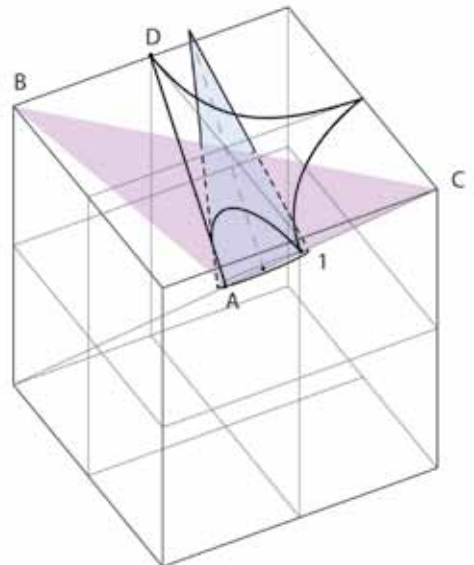
STEP 1: The "Batwing" minimal surface's fundamental tile fits in a tetrahedron with the tip at point A and its base in points 1, 2, and 3. Point 1 is also the center of the cube



STEP 2: The first curve of the minimal surface is drawn from point A to point C. Point A is also the center of the cube. Point C is the midpoint between Points B and D



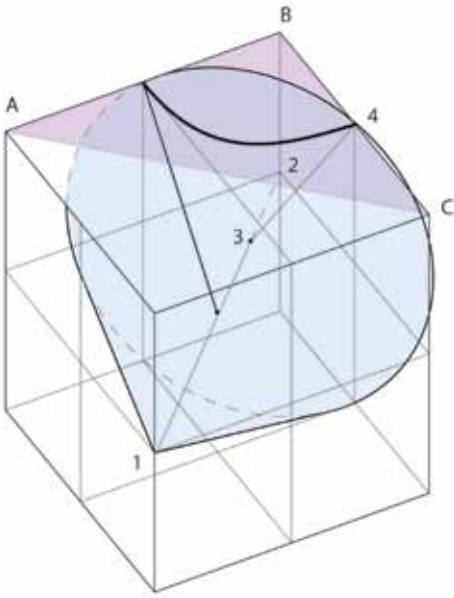
STEP 4: The third curve is drawn from the intersection of a plane point A, B, and C and a cone extending 3/4 of line from point 1 to point C and a radius from point 2 to midpoint 3. Point 3 is the midpoint between point B and C.



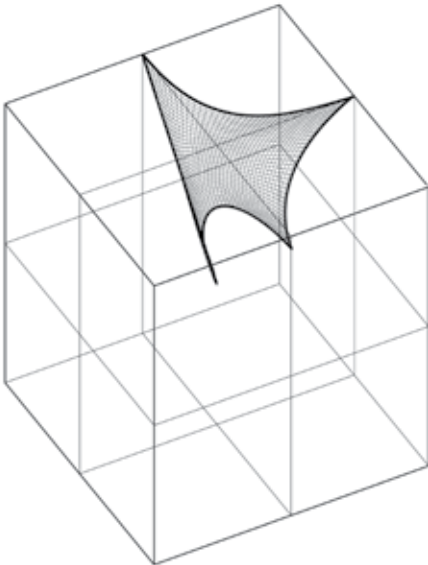
STEP 5: The last curve is drawn from the intersection of a plane, A B and C, where point A is the center of the cube and a cone with a base diameter of the length of the last curve point 1 and point A. The length of the axis of the cone should be the same distance as line A D.

SURFACE AREA REDEFINED

The fundamental unit of Alan Schoen's "Batwing" formation can be derived by a set of simple geometrical steps. These steps include the simple creation of cones and planes from lines within the parameters of a cube. The tiles can be manipulated to complete astonishing forms. The final "Batwing" form is displayed in the following illustrations. Outside of the realms of mathematics and physics, their applications in our urban environment seem fascinating and yet to be explored.



STEP 3: The second curve is drawn from the intersection of a plane created from points A,B, AND C and a cone extending $\frac{3}{4}$ the length of line from point 1 and 2 and a radius from point 3 to 4. Point 4 is also the midpoint between point B to C.



Fundamental unit of minimal surface "Batwing" is complete.

*Images complied by author.

The minimal surface modular design technique can also approach proximity as an opportunity for public safety. Another characteristic of minimal surfaces is their ability to optimize visibility. Minimal surfaces have the potential to extend visibility in multiple directions. Community activist and author, Jane Jacobs, described the importance of visibility in public space as an instigator for public safety. Busy cities mean busy streets, the insecurities of urban life “cannot be solved by spreading people out more thinly, trading the characteristics of cities for the characteristics of suburbs” (LeGates, R.T. & Stout, F., p. 107). Through good design and planning; an effective system of public surveillance through the use of minimal surfaces as urban forms can be explored.

As side from the natural aesthetics and peculiarities of these recent forms, their applications seem endless and yet to be explored. Minimal surfaces also extend light, temperature, and ventilation in new patterns. In this technique, minimal surfaces can also be a new way of approaching “green” building issues. In order for minimal surfaces to successfully fulfill these aspects, they must first prove to contain “green” properties. Professional engineer, Jerry Yudelson, defines a “green” building as a “high performance property that considers and reduces its impact on the environment and human health. A green building is designed to use less energy and water and to reduce the life cycle environmental impacts of the materials used. This is achieved through better siting, design, material selection, construction, operation, maintenance, removal, and possible reuse” (2008, p. 13). In an effort to maximize modular space and reduce surface area, minimal surfaces attempt to save the costs of excess construction material. Nevertheless a question still remains, how much would minimal surfaces actually cost? A minimal surface would require architects, engineers, and designers to justify the benefits of the costs of such a project to building owners, public agencies, private developers, or corporate real estate executives. One of the “biggest obstacle for green buildings is the perception that they cost more” (Yudelson, 2008, p. 13).

The ultimate goal in this case would be to outweigh the cost of a particular project by creating a system that will create greener communities, healthier homes, material efficiency, and architectural eloquence. In an integrated design process, where every characteristic of the minimal surfaces is examined, it is clear that the biggest cost reducer is the significance of careful thought and time, “if time is not taken to bring together all the relevant parties and study alternatives before fixing on a final design, a project may miss opportunities to make single systems carry out multiple tasks” (Yudelson, 2008, p. 50). The characteristics of minimal surfaces can be exploited in an integrated design process, where the minimal surfaces can potentially become the agents of change.

Much is yet to be learned about minimal surfaces and their potentials as urban forms. There are many minimal surface forms yet to be discovered and explored; in this case Alan Schoen’s Batwing form is a prime example of the curvature, characteristics, and potential urban applications that many other minimal surfaces present. Through the careful practice of design and application, minimal surfaces as urban forms can be a step in investigating creative solutions for the urban issues of today, and tomorrow.



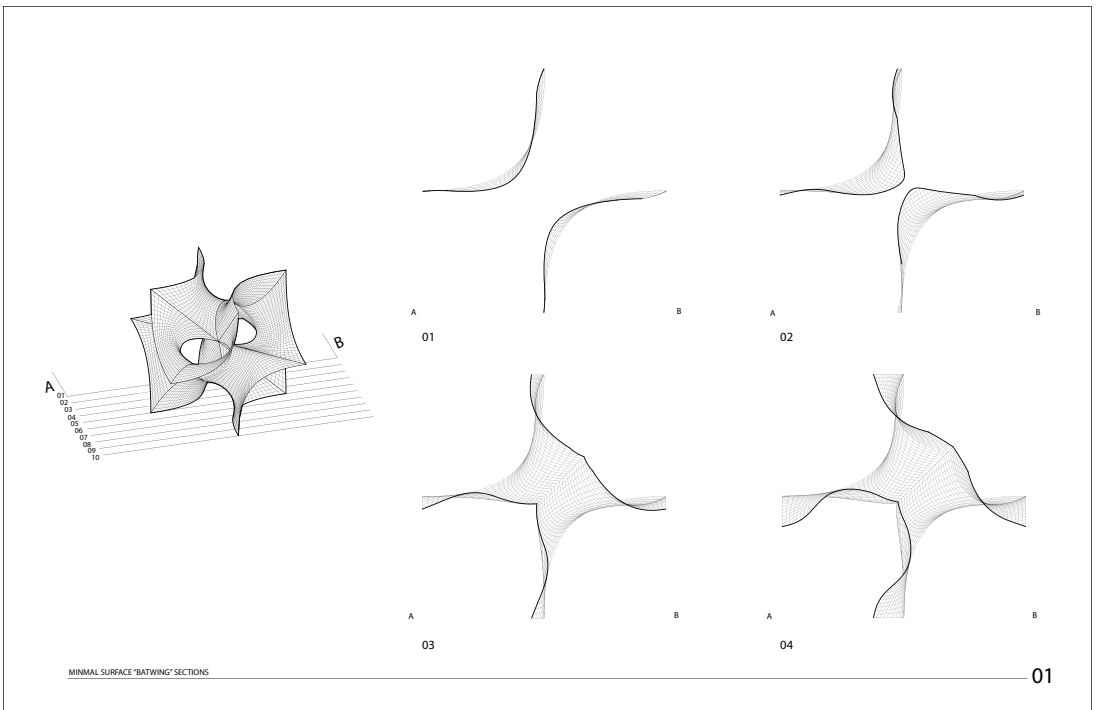


Figure 6A. Regressive sections 1-4. *Complied by author.*

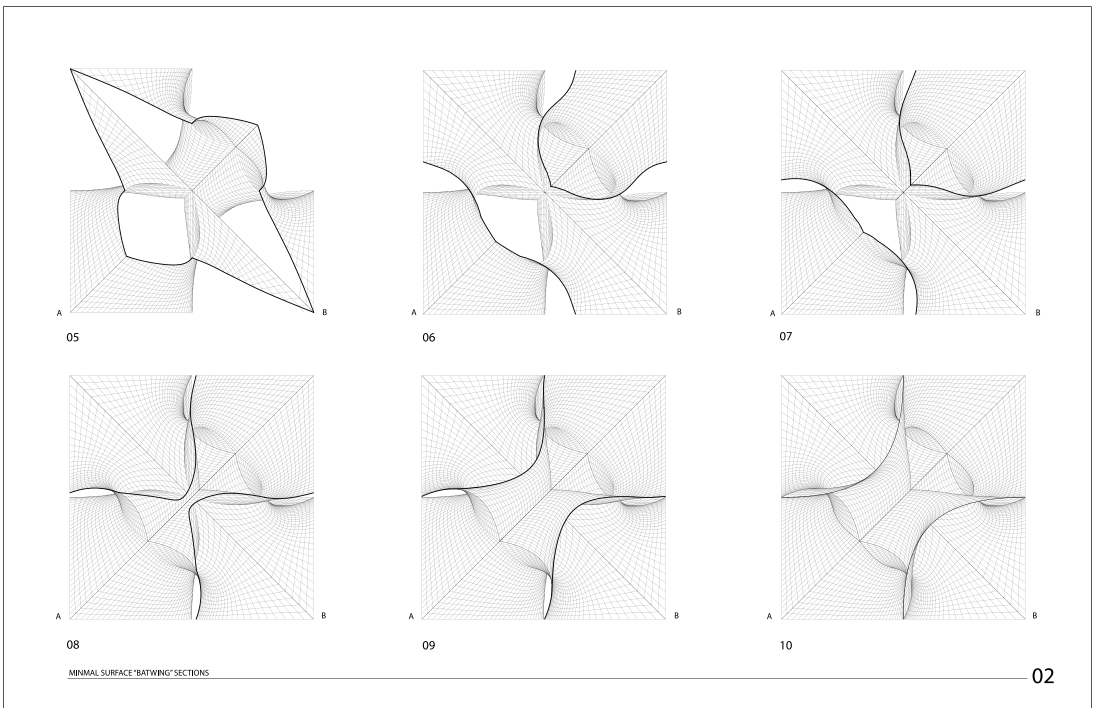
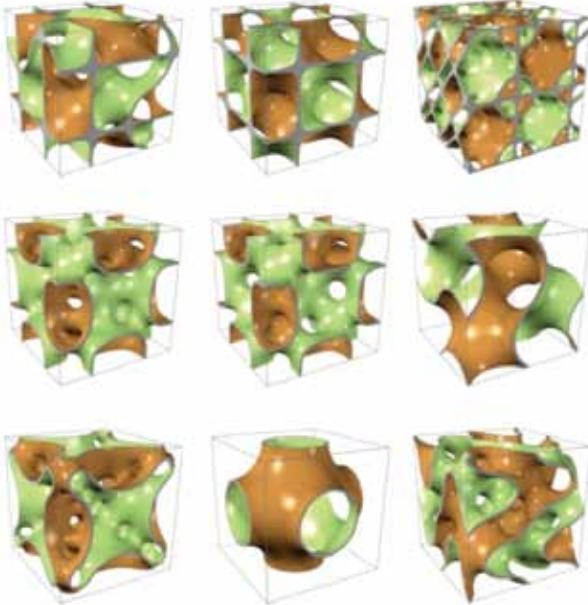


Figure 6B. Regressive sections 5-10. *Complied by author.*

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Parking, Poverty, and Employment

Chris Brodeur

The Effects of Parking Tickets on Employment. Governments use parking as the primary tool in controlling car use inside of cities. By controlling both parking supply and enforcement local governments have been able to regulate the impact of vehicle congestion and pollution. However, the decisions around parking enforcement have produced externalities that scholars and city leaders did not plan for. Vehicles still play a necessary role in a society that was built around the use of automobiles. It has been demonstrated that vehicle ownership is likely to increase an individual's ability to find and maintain employment by as much as 30% (Ong 2002, Baum 2007, Sandovala 2010). With unemployment levels 9% and poverty levels inside San Francisco at 12.5% (Census, 2010) The effect that parking citations and towing has on lower income and unemployed populations in San Francisco can mean the difference in whether an individual is able to find and maintain a job. Therefore, alternative solutions need to be formed to provide a more equitable parking management option that does not disproportionately effect the impoverished and unemployed in San Francisco.



TIMES ARE HARD

San Francisco is an advanced economic hub for the Bay Area region. The science and technology industries constitute 20% of jobs inside the city, and management jobs are over 40% of the entire job field (Census, 2010). The city also has one of the highest rates of individuals with a higher education in America with over 50% having attained a bachelors or masters degree (Census 2010). Unfortunately, the job market in San Francisco is focused primarily on the technology, medical and management services, positions which require a graduate level education that many San Franciscans do not have. 30% of San Franciscans either have dropped out of high school or only have their high school diploma (Census 2010), and are not able to compete for the jobs that are coming to San Francisco. San Francisco's job availability has increased in the professional sector but shrunk in blue-collar sectors, causing unemployment and poverty to rise for the individuals and households who cannot compete for the influx of professional jobs. In an economic depression San Francisco government needs to do more to help those who are impoverished or unemployed by reducing the financial burden of living in the city in order to help these individuals find and maintain employment.

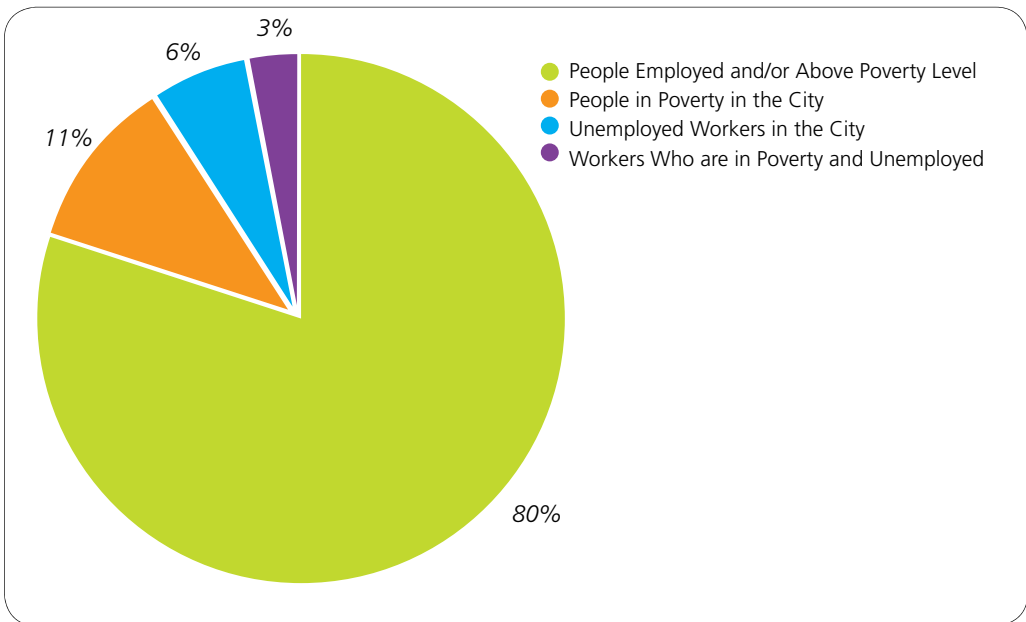


Figure 1: Poverty and Unemployment in San Francisco

Over 12% of the entire population is in poverty, or roughly 99,000 individuals. The rate of unemployment is at 9% in San Francisco, and of those unemployed 25% of them are in poverty. (Census 2010)

POVERTY IN SAN FRANCISCO

The US Census defines poverty as any individual who makes under \$11,139 a year. The formula for calculating unemployment for families is more complex based on things like family size and dependents (Census Website, 2011).

In San Francisco over 12% of the entire population is in poverty, or roughly 99,000 individuals (See Figure 1).

UNEMPLOYMENT

Although San Francisco is experiencing job growth among certain job sectors, jobs available to lower educated individuals is falling. Those individuals without competitive degrees or experience are more likely to be in poverty than San Franciscans who have received a higher education (Census 2010). Over 9% of San Franciscans are unemployed, and of those unemployed 25% of them are in poverty (See Figure 1).

SAN FRANCISCO CAN DO MORE

With unemployment and poverty on the rise San Francisco government needs to consider how they can reduce the financial burden of these challenged individuals. One of the primary ways they can do that is by increasing the amount of blue-collar jobs inside San Francisco. This would eliminate the need for long distance commuting solutions and allow the 30% of the work force without college degrees to compete for local jobs. Another solution would be to provide adequate public transportation that would allow workers in poverty to travel to where there is available blue-collar work. San Francisco government has used public transportation to provide affordable transportation to work, but these solutions do not provide convenient access to jobs outside of the city in times where job availability within San Francisco is low. Motor vehicles provide a necessary function for those people who need to find remote jobs, or have a job outside of the reach of public transportation. Vehicles have been shown to have a significant impact on an individual's ability to find and maintain employment by as much as 30% (Ong 2002, Baum 2007, Sandovala 2010). Until the government is able to encourage job growth in San Francisco, and increase transportation alternatives to those without jobs or who are in poverty, it needs to consider how vehicles play a necessary role in employment access for those who are forced to look for employment outside the city. The local government should also provide for those who are in poverty and without jobs subsidized services and reduced taxes and fines, such as parking citations.

CURRENT CAR ACCESS AND USE IN SAN FRANCISCO

There are 470,481 cars registered in San Francisco (DMV, 2010), which serves 69% of the population. Of these car owners 45% of them use their vehicles to get to work (See Figure 2). This number is low compared to the national average because of the effectiveness of the public transportation system in San Francisco. Not all of San Francisco's jobs are within the reach of public transportation; over 193 thousand people have to commute outside the city limits to work and of those individuals over 52 thousand are in poverty (Census 2009).

VEHICLE OWNERSHIP ENCOURAGES FINDING AND MAINTAINING JOBS

In the study From Welfare to Work Professor Ong explains how car ownership increases the likelihood of a welfare recipient finding a job. His conclusion states car ownership could increase the chance of being employed by 9%. There is a large field of study that shows a car is an important part of

finding employment, and among a study conducted of single mothers a car increased a mother's chance of having or getting a job by 30% (Baum 2007). 52,000 individuals in poverty rely on their vehicles to get them to jobs that public transportation cannot conveniently take them. If they did not have their vehicle it would be likely that they would not be able to maintain their employment. As for those who are currently unemployed, being able to acquire a new vehicle or maintain one already owned gives them an advantage in finding remote jobs.

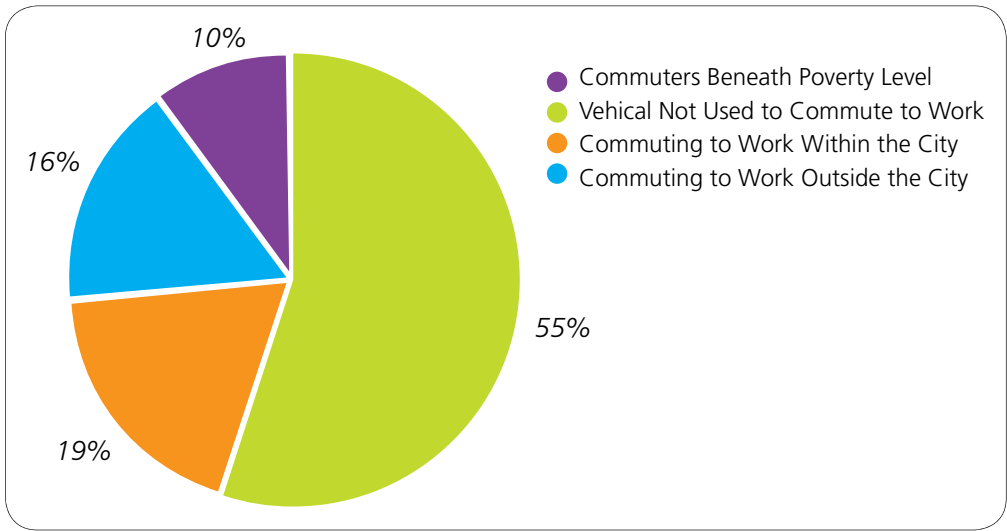


Figure 2: Trends in San Francisco Vehicles

45% of vehicle owners use their car to get to work. 26% of those commute outside the city, and 10% of these commuters are in poverty. (Census 2009, 2010)

THE FINANCIAL DIFFICULTIES IN OWNING A VEHICLE

For those who are impoverished or unemployed the costs of owning and maintaining a vehicle in San Francisco can be egregious. With high insurance premiums and vehicle registration costs on the rise, it is becoming more difficult for these individuals to keep their vehicles. Vehicle ownership helps the 52 thousand people in poverty who commute out of San Francisco to maintain their jobs, and would aid those who are also unemployed in finding employment. Yet the city government has instituted many policies that make it financially difficult for people who are in poverty to own a vehicle.

SAN FRANCISCO MUNICIPAL TRANSPORTATION AGENCY

The San Francisco Municipal Transportation Agency (SFMTA) "is the City's mobility manager and operates the entire surface transportation network that encompasses pedestrians, bicycling, transit, traffic and parking" (SFMTA.com). In regards to parking and traffic the main way that SFMTA regulates is through fines and fees. By instating a parking fine, or having a parking meter, the agency can change the demand for parking by increasing or lowering fees. This mechanism is used to ensure that there will be available parking at any time of the day so that new patrons or residents can have parking avail-

ability, and to reduce the total amount of cars by motivating people to use public transportation rather than drive. This has been a successful tool to control the amount of cars in the city; because the cost is too high for many to park, it causes them to choose public transportation alternatives, like trains or buses. SFMTA has been successful in its goal to reduce the amount of vehicles by enforcing increasingly higher fines, but it has failed to recognize the necessity of vehicle access for the low income San Franciscans who are forced to commute to work outside the city. For these people the SFMTA has become a burden that for many is threatening their ability to get to and from work.

SFMTA's Issues

The decreasing rate of car ownership and increased use of public transportation has made SFMTA a success. Its results are celebrated as revolutionary and its methods are being replicated across the country, and yet San Franciscans question the legitimacy of its policies as the SFMTA's fines and fees become increasingly unmanageable. According to a recent press release from the SFMTA management the agency needs to raise parking fines and rates in order to balance its budget (Chronicle, 2011). The last four times SFMTA has raised fines it has sighted budgetary excuses as to why they were doing it (Chronicle 2011, 2008). Increased parking fines and fees are used to regulate the demand for parking, but increasing prices in order to cover a budgetary gap shows that SFMTA is no longer using parking demand as the primary factor when deciding to raise ticket prices and meter rates. In the last 15 years the revenue from parking tickets has doubled in size from \$49,500,000 to 101,384,000, increasing at a rate that is over 150% above inflation (SFMTA Sunshine, See Figure 3).

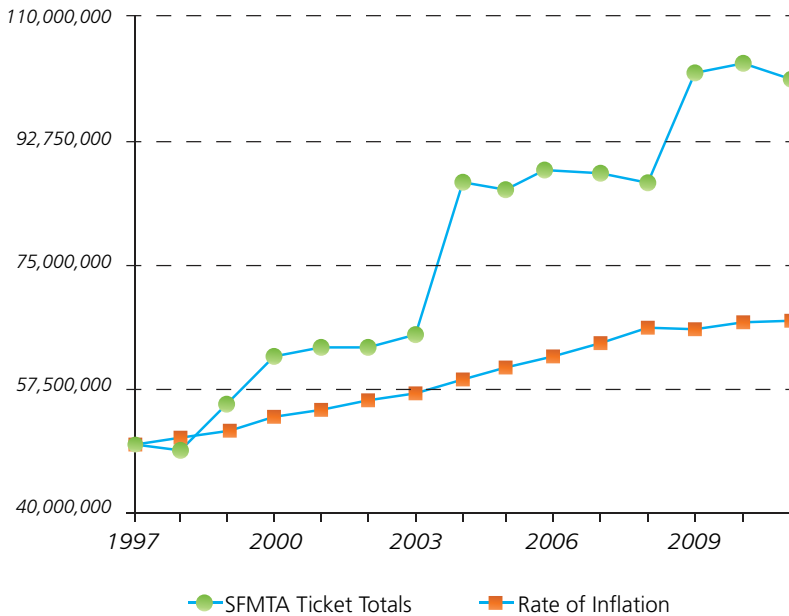


Figure 3: Total SFMTA Parking 1997-2011

In the last 15 years the revenue from parking tickets has doubled in size from \$49,500,000 to 101,384,000 increasing at a rate that is over 150% above inflation. (San Francisco Budget, 1997-2011)

Another delegitimizing behavior is how SFMTA's parking program fees and budget has only continued to grow, even though the number of drivers has decreased (Census 2000-2010). San Francisco's parking rates have become so large that they are the highest in the country. In parking meter violations charged across the country San Francisco's \$65 ticket was the highest, beating even the larger cities of New York and Los Angeles. In parking meter rates it is a close second to Los Angeles at \$3.50 per hour, well above the national median of \$1 per hour. The rates of these meters have quadrupled in the last ten years from fifty cents to two dollars outside the downtown of San Francisco, and parking fines have on average increased \$30-40 dollars per ticket (SFMTA, Sunshine 2011). Despite little to no growth in the population over the last decade, San Francisco has experienced a skyrocketing effect in parking fees. According to the transportation legal charter they may raise fines at their own discretion (San Francisco Transportation Code 2011). With no scientific rationale connected to parking management for raising prices the SFMTA is in an awkward position. The size of the organization has continued to balloon and it has increased parking fees and fines in order to cover its costs. This behavior has made car ownership in San Francisco something that only the wealthy can easily afford, and put the impoverished and unemployed at a disadvantage.

SFMTA ROLE IN UNEMPLOYMENT AND POVERTY

With unemployment and poverty on the rise in San Francisco the city government needs to examine every way they can increase an individual's chance to find and maintain a job. Vehicles are necessary for 52 thousand impoverished commuters to get to their jobs outside the city and could also help many unemployed find work where public transportation cannot easily give

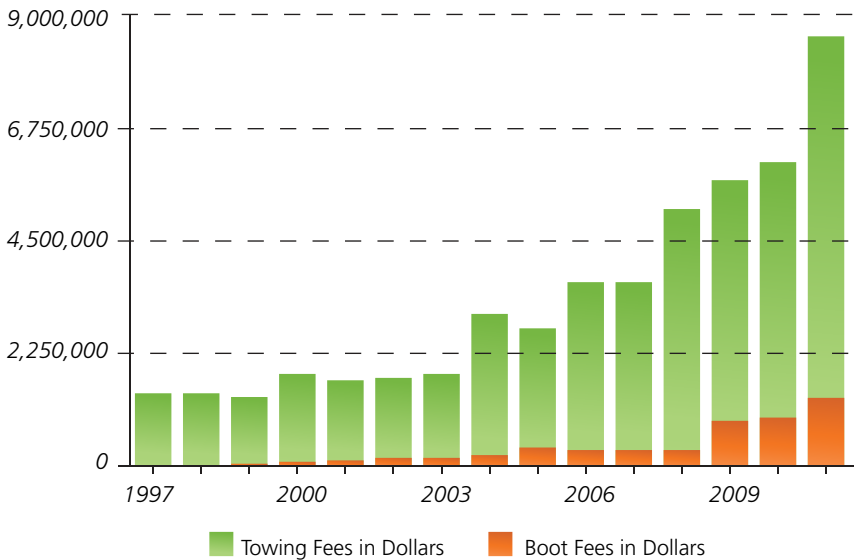


Figure 4: San Francisco Towing and Booting Fees 1997–2011

The costs of towing and booting expresses the amount of vehicles towed and booted. For every car that is towed there is a \$182 fine, and for booting there is a \$298 fee. (San Francisco Government, Annual Budget 1997-2011)

“In the past 15 years the amount of cars that are booted and towed has grown five times”

them access. The government needs to assess the effect the SFMTA has on impoverished and unemployed persons’ ability to keep a car. In examining the outcomes of the parking tickets issued, the vehicles towed and booted, and the amount of auctioned cars in a year it is clear that SFMTA has a major effect on individuals ability to maintain their vehicle.

PARKING TICKETS IN SAN FRANCISCO

One way of observing the effects that the SFMTA has on low-income individuals is by looking at parking fines. SFMTA issued 1,803,612 total tickets in the year 2010 to 708,162 license plates (SFMTA, Sunshine 2011). These tickets could be for anything from a parking meter violation to double parking and have fees that range from \$50 to \$1,000 dollars. The fees brought in \$103,800,000 dollars in 2010 (See Figure 3. SFMTA, Sunshine 2011). Of the total number of tickets issued in the year 2010 407,295 of them only received one ticket and 300,867 people received more than one. Those 300,867 thousand people received on average 4.6 tickets per vehicle, which would mean that they would pay on average \$299 in parking fees in a year. That doesn’t mean that each vehicle received an equal amount of tickets, one vehicle received 398 tickets totaling \$26,363. This could mean that the added cost to keeping a vehicle could be from \$65-\$26,363 a year which could mean the difference in an impoverished or unemployed person keeping their vehicle.

TOWING AND BOOTING IN SAN FRANCISCO

Another way of observing the impact that the SFMTA has on the San Francisco population is in booting and towing. Over 70,000 cars were towed in San Francisco in 2010; these vehicles are towed for many reasons from double-parking to blocking a driveway (See Figure 4). Getting towed is an expensive process that costs over \$500 and takes the better part of a day to resolve, and if a car is stored for longer than a day it is subject to daily fees of \$53. Important subsets of those who are towed are the vehicles that are booted. The “boot” is a metal device that is attached to the tire of a car and administered because the vehicle owner has failed to pay his or her parking fines. In San Francisco in 2010 6,454 vehicles were booted because they had more than 5 unpaid tickets, or owed more than \$500 to SFMTA (Figure 4. SFMTA, Sunshine 2011). Once the boot is administered the individual has 72 hours to pay their fines and the \$298 boot removal fee, but the majority of individuals are unable to pay the fines and their vehicle is towed. This indicates that a lack of financial capital is most likely the reason the 6,454 of these cars are booted and towed. In the past fifteen years the amount of cars that are booted and towed has grown five times from what it was in 1997. Using the boot and towing fees it is possible to see that the fees and number of vehicles affected has dramatically increased (See Figure 4).

VEHICLES AUCTIONED IN SAN FRANCISCO

A final way of observing the externalities of the SFMTA is to observe the number of cars that are auctioned every year. The SFMTA tows vehicles, and if the vehicle is not reclaimed and the tickets paid the SFMTA is allowed to auction off the vehicle in order to pay the money owed to the agency. SFMTA auctioned 5,838 vehicles in 2010 (SFMTA, Sunshine 2011) because the owner



of the vehicle failed to reclaim the vehicle and pay the fines. Whatever the retail value of the towed vehicle it is never financially solvent to let the SFMTA auction a vehicle. In the auction environment cars will usually sell far under their fair market value, and whatever balance is still owed after the car sale is sent as a bill to the owner. If the vehicle sells for more then the ticket price SFMTA keeps the remainder. It would stand to reason that most of the 5,838 cars that are auctioned every year because the owner is financially unable to reclaim the vehicle.

HITTING THEM WHILE THEY'RE DOWN

The high cost of tickets in San Francisco make it difficult to own a vehicle, and for some the inability to own a vehicle could mean not being able to find or maintain a job. Those who are unemployed or in poverty in San Francisco are the people that need the help of the government and yet they are being disproportionately affected by SFMTA's parking fines and fees. As a percentage of their total income, people who are in poverty spend a higher portion of their income on tickets than those who make a larger salary. In examining one of the 99,000 people in the city who makes less than \$11,139 a year who receives \$299 in tickets, that would mean that they were spending 3% of their income on parking tickets, whereas someone who made 50,000 would be only spending .5%. In considering the cost of tickets in addition to the total cost of owning a vehicle ticketing is likely to be a major deterrent to someone who is impoverished or unemployed in owning a vehicle. The costs of tickets in the city are high and could be the reason why the 9% of unemployed San Franciscans are unable to find or maintain employment

FINDING A MORE EQUITABLE ALTERNATIVE

The government needs to evaluate a more equitable solution in providing parking regulation that does not disproportionately affect those in poverty, and give those without employment a better chance of finding jobs by reducing the cost of owning a vehicle. The way they can do that is by creating more local jobs, providing reliable public transportation to remote jobs or making it possible for individuals to maintain a private vehicle to commute to remote

jobs. While the region faces an economic recession and jobs are decreasing for the lower class, public transportation might not make it feasible to travel the distances required for some individuals to find work. By decreasing the financial impact of the parking fines and fees of the SFMTA on San Franciscans who are impoverished or unemployed, and creating a more analytical approach to raising fines, the city will improve those individuals' opportunities to find and maintain employment.


ANALYTICAL APPROACH IN DETERMINING TICKET PRICES

In order for San Francisco to justify the increase in parking tickets it needs to establish a rationale for raising the cost of tickets. If San Francisco government only wanted to regulate the availability of spaces then it would need to find the dollar amount that would keep an individual driver from staying over a certain amount of time in a parking spot, and what parking fine would ensure that they followed those laws. In order to find that amount a study needs to take place to determine the elasticity for parking rates and fines in order to find what cost is appropriate to effectively manage vehicle use.

A PROGRESSIVE FEE STRUCTURE FOR TICKET COSTS

Price elasticity for parking would need to be then determined separately for each economic group because the cost of fines and fees impact drivers differently based on their income. For the individuals who qualify based on income and employment status the SFMTA should create a tiered payment schedule that would ask less from those who are in poverty or those who are unemployed. What would be required is for a proof of income from the prior year, based on tax filings, which would put a vehicle owner into a ticket bracket that would discount their final ticket price depending on their income. This would still regulate the demand for parking because it would determine the elasticity for each margin of income.

CONCLUSION

By reducing the cost of owning a vehicle for people who are impoverished or unemployed the city government could increase the chances of those individuals being able to find and maintain work by as much as 30%. One way the city could do this is by bringing a rational approach to the SFMTA's parking regulations, and reducing the financial burden on those without adequate money to pay the fees and fines. In doing this the San Francisco Government would give the 9% of workers without jobs an ability to commute out of the city to remote job opportunities, and allow the 52,000 impoverished individuals who already commute out of the city using their cars to reach their jobs by reducing the cost of maintaining their vehicle. In a time where San Francisco is unable to provide an adequate number of blue collar jobs within easy public transportation commute it needs to find other ways of insuring that people can maintain their vehicles so they can find and keep a job. 

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The N Judah:

Deficiencies and Alternatives

Brett Thomas

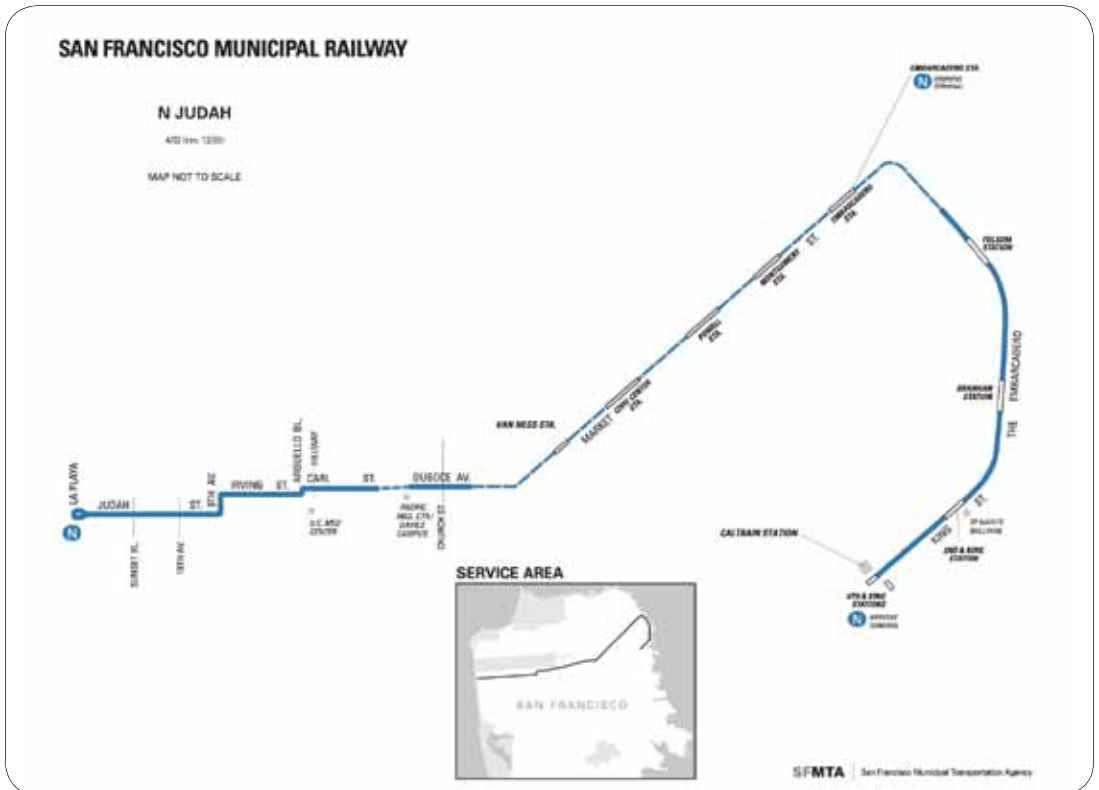
Celebrating its 100th anniversary this year, Muni is a controversial issue in the city with its shortcomings and struggles to improve itself. As San Francisco puts itself forward as a transit first city, we struggle to provide efficient and reliable transit service. The following piece will explore these implications on one of San Francisco's busiest transit lines, the N-Judah and provide possible solutions for improving transit service. The author will explore the history and current situation. Providing the reality San Franciscans know all too well about Muni with background as to why we struggle to have an efficient transit system.

SITE AND SCENE

The N-Judah is a Light Rail Vehicle (LRV) transit line located in the city of San Francisco, CA. The line is operated by the San Francisco Municipal Railway (Muni). It connects the Ocean Beach, Outer Sunset, Inner Sunset and Cole Valley neighborhoods to the Market Street Subway. The line has its Out-bound, or western terminus, at La Playa Street and Judah Street, just east of the Pacific Ocean. On weekdays inbound service terminates at the San Francisco Cal Train Depot. On weekends inbound service terminates at the Embarcadero Station of the Market Street Subway

The N-Judah is the most diverse line in the Muni Metro light rail system. It runs on three surface portions and in three subway tunnels. The three subway tunnels are from West to East: The Sunset Tunnel, the Duboce Tunnel, and the Market Street Tunnel. The three surface portions are: Ocean Beach to Cole Valley on the west, Duboce Avenue in the middle, and The Embarcadero to King Street on the East. Seventy percent of the line runs on surface streets (SFMTA, 2011, p. 2).

The N-Judah is the busiest line in both the Muni Metro rail system and the entire Muni transit network including all modes. There are 45,252 daily boardings on the N-Judah. The line accounts for almost a third of the daily trips made on the entire Muni Metro rail system (SFMTA, 2007, p. 1). The N-Judah line has higher ridership than many cities' entire light rail networks such as San Jose, CA, with fourteen thousand less daily boardings than the N-Judah.



*Source: San Francisco Municipal Transit Authority

Map 2:

Highlights the high level of development in 1920 of the area served by the N-Judah (red) vs the low level of development of the area served by the K, L, M (Blue)



Source: <http://www.zpub.com/sf/stpop1.jpg>, accessed December 8, 2011

The majority of Inbound trips are generated, and the majority of Outbound trips are terminated West of the Duboce Tunnel (SFMTA, 2007, N-Judah Graphs). 24 of the line's 33 stops are in these neighborhoods. Early residents of these areas had their transportation needs met by omnibuses. In 1912 the Market Street Railway began the first rail service to the neighborhoods. In 1917 Muni began bus service to the area.

In 1919 the Twin Peaks Tunnel opened and streetcar service began to the neighborhoods of Ingleside, Lakeside and Parkside which were less developed than those along Judah Street. This highlighted for the first time the underrepresentation by Muni of the neighborhoods served by the N Judah, which continues to this day. The residents took matters into their own hands. In 1921 they proposed a tunnel under the Buena Vista Ridge to allow for streetcar service into their neighborhoods. To pay for the project the Board of Supervisors formed an Assessment District. In 1926 construction began on the Sunset Tunnel. In 1927 the N-Judah streetcar began service through the tunnel and into the neighborhoods (Perles et al, 1981, p. 91). By 1956 the N-Judah was the busiest line in the city (Perles et al, 1981, p. 133).

In 1962 San Francisco Bay Area voters approved a bond measure to finance a rapid transit network for the region called BART. The measure would not have received the sixty percent of region wide yes-votes necessary without San Francisco voter participation. San Francisco decided to hold out unless modernization of their Muni streetcar network was tied to the development of BART, who agreed to build an additional subway tunnel to lease to Muni for future uses with its planned modernization (Perles et al, 1981, p. 214).

Calls were made for replacement of the N-Judah with a bus or a surface-subway or rapid transit rail line. The 1966 Simpson Curtain Plan proposed a rapid transit line called the Market-Judah-Sunset, to replace the N-Judah. The proposal was defeated by voters in a landslide. Preparation for revisions of the San Francisco Comprehensive Plan in 1967 lead to two possible plans for the N Judah: surface to subway streetcar or bus. In 1968 Mayor Alioto announced that modern articulated streetcars were most suitable

for Muni use. BART was notified and Muni became obligated, for the first time, to develop a vehicle capable of conventional streetcar operation on the surface and also able to mimic rapid transit trains in the subway (Perles et al, 1981, p. 216).

In July of 1968, the San Francisco Municipal Railway Improvement Corporation (SFMRIC) was organized to pay for the modernization of the street cars. The first bids came back to high in 1971 and were rejected. Boston, Ma was developing a new street car system at the same time. In 1972 the SFMRIC teamed up with the Urban Mass Transportation Administration (UMTA) in order to secure funding to replace the old street cars with LRVs. A condition was put forth by the UMTA that San Francisco and Boston make a joint order to lower cost (Perles et al, 1981, p. 230). In 1973 Boeing came in as the low bidder. The first LRV was completed in 1974, but because of the need for continuous redesign the subway would not open for several more years. At a Muni staff meeting in February of 1976 it was decided that Muni Metro subway operations would commence on the N-Judah because it had the highest ridership in the city. Four years later on February 18, 1980 at 5:00 am the N-Judah began operation on the subway and on the surface (McKane et al, 1982, p. 201).

PROBLEM IDENTIFICATION

There currently exists a need to rethink the N-Judah. The line is the busiest in the city and is already well over capacity. The N-Line moves the bulk of its passengers on light rail vehicles operating in mixed traffic on city streets. As San Francisco's population continues to grow the city's general congestion and traffic will increase (San Francisco Municipal Railway, 2002, p. 2). An increase in congestion and traffic will have severe effects on the performance of the N-Judah. The N-Line bisects the city roughly in half running from East to West. As the city continues to experience densification, the N-Judah will become ever more important as a central transit line. This will greatly increase ridership on the transit line. As the city continues to grow the N-Judah's existing problems will be magnified. Confronting these problems now will save the city time and money.

The N-Judah's problems can be broken down into one of three categories. The line's first problem is capacity issues. There is not enough room for passengers to wait on the sidewalk at many of the busiest stops on the surface portion of the line. The trains are predominately standing room only during AM and PM peak travel hours. The problem is so bad that conductors often have to skip stops because there is not enough room for any more passengers on the train (SFMTA, 2011, p. 10). The problem of skipped stops is most pronounced from Cole Valley to the Duboce tunnel. The capacity shortfall is discouraging new ridership on the light rail line.

The second problem is increasing travel times. The N-Judah has slower travel speeds today than when it began service in 1927. It currently takes one hour to travel from the western terminus of the N-Judah line in Ocean Beach to Embarcadero Station in the Financial District. This same trip took only 44 minutes in 1998 (Balitactac, 1998, p. 25), and just 41 minutes in 1945 (Perles et al, 1981, p. 246). It takes the same amount of time to travel from the Financial District to the suburban BART station in Dublin/Pleasanton, and to San Jose by CalTrain.



Photo 1: Long headways on the N-Judah.



“The N-Judah has slower travel speeds today than when it began service in 1927.”

The third problem is poor schedule adherence and reliability. The trains often run ten minutes or more behind schedule. Thirty minute headways, or the time between consecutive trains arriving at key stops, are common.

The problems observed on the N-Judah are having effects on the entire Muni Metro network. Due to some of the problem causes discussed in the next section of this paper the line often gets backed up on the surface segment of its run. This backup occurs in the form of two or more trains arriving at the same stop with no headway between them. When the backed-up trains reach the subway tunnel they arrive at the subway stops in consecutive order. This decreases the platform berthing room for other Muni Metro lines. Muni does not allow for double berthing of trains on subway platforms. This leads to a decrease in schedule adherence for the other trains in the system.

PROBLEM CAUSES

At capacity the Market Street Tunnel can accommodate sixty trains per hour through any given station. In order for system-wide schedule adherence, only forty to forty-five trains can be accommodated per hour through any given station. The tunnel currently runs at capacity during AM and PM peak travel times (EMASC, 2011). The Muni Metro system uses two car trains. Therefore there is no way to increase capacity on the line without decreasing headways. There is no room in the tunnel to accommodate the added trains that are necessary to decrease N-Judah headways. There are no additional LRV trains available for Muni to add to the N-Line. Sidewalk capacity problems

are the result of key line stops accommodating a high amount of boarding and offloading of passengers on sidewalks that are too narrow to handle the volume. Expansion of the sidewalk results in loss of automobile parking space and throughput.

Dwell time is defined as the amount of time a transit vehicle sits idle at a transit stop. Slow boarding and offloading at transit stops increases dwell time. N-Judah trains are designed for subway use so their boarding is designed to occur on above grade raised platforms such as those found in a subway tunnel. This allows passengers to make an easy transition from the platform to the interior of the train because they are at the same grade. On the N-Judah boarding occurs at grade on the surface portions that exist west of the Duboce Tunnel. Therefore at each stop that the train makes, passengers must climb up stairs to board the train or down stairs to exit the train. This slows down the boarding and offloading at each transit stop. With twenty-four surface transit stops having this design the increase in total dwell



Photo 2: The N-Judah gets backed up on the surface (circled in red) Source, Author, November 16, 2011.

time on each run is substantial. Furthermore, lowering and raising the steps to conform to subway operation upon entering and exiting the tunnel adds to the overall travel time of each run.

Outside of peak hours passengers must push a button in order for the door to open on rear trains. This adds a few more seconds of dwell time at each surface transit stop as passengers wait for the door to open before boarding. Increases in dwell time are pegged to increases in ridership. As the N-Judah increases its daily boardings the increase in riders will lead to an increase in the amount of time spent boarding and offloading. The increase in dwell time leads to increased travel times.

The majority of N-Judah surface operation occurs in a shared right-of-way with other modes of transportation such as pedestrians, cyclists, and automobiles. The train must yield to pedestrians and cyclists at crosswalks. The train mixes with automobiles on the length of the streets it is traveling on, and deals with problems of automobility such as congestion, aggressive drivers, and waiting at stop lights. The N-Judah runs through highly automo-

“The N-Judah serves a neighborhood with a lower intensity of uses than most of the city.”

ble congested nodes such as: Ninth and Irving, Cole Valley, and the Duboce Triangle. The N-Line crosses two of the most heavily traveled automobile paths in the city: 19th Avenue and Sunset Boulevard. At these intersections the N-Judah waits at traffic signals for a significant amount of time. Traveling in a shared right-of-way greatly decreases travel speed, and leads to increased travel time on the N-Line.

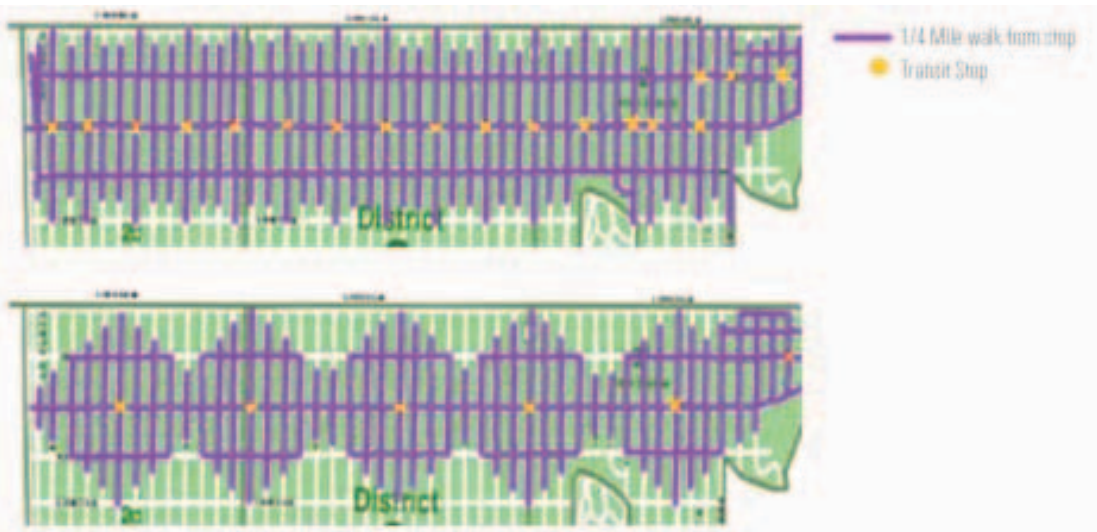
The N-Judah spends much of its surface operation on narrow neighborhood streets. Carl street, where the train travels for half a mile is “the narrowest residential street with rail in San Francisco” (EMASC, 2008). On these narrow streets the conductor must be more cautious than on wider streets because of the greater difficulty to accommodate all users on the street at any given time in comparison to wider streets. This caution results in slower travel speeds. Furthermore, the N-Judah politically competes with automobile level of service. The needs of the N-Judah often take a back seat to automobiles.

There are too many stops on the surface portion of the N-Line. The N-Judah makes thirty-three stops on a full run from Ocean Beach to the Cal Train Depot. Twenty-four of the transit stops are located over 3.4 miles of surface rail west of the Duboce Tunnel. This equates to a transit stop located every .14 miles over this surface portion of the line. These stops are often redundant and located every block. The dwell time of twenty-four combined stops accounts for a significant portion of the overall time spent on each run. The excessive number of transit stops is attributed to two key factors. First, the placement of transit stops is often politically motivated. This politicization of transit stop placement is accompanied by short-sightedness. An example is when handicapped access was expanded to the line; a handicapped accessible stop was placed at Funston Avenue and Judah Street a mere seven houses from the transit stop located one block away at 12th Avenue and Judah Street. Due to the high volume of passengers served, the train stops at both stops on most runs.

Secondly, the N-Judah serves a neighborhood with a lower intensity of uses than most of the city. This low intensity of uses is the result of height and zoning regulations that were implemented shortly after development of the neighborhood began. This led to a relatively low population density in the surface neighborhoods served by the transit line. Typically people have a comfort threshold of a half-mile walk to reach their destination from their origin. This means that people are willing to walk a quarter of a mile to the transit stop nearest their origin and a quarter of a mile from the transit stop nearest their destination. The current configuration of transit stops along the surface portion of the N-Line allows for a much larger area to exist within a quarter of a mile walk from each stop. Therefore because of the low population density in the surface neighborhoods served by the N-Judah, a larger number of riders are served with more frequent stops.

PROBLEM SOLUTIONS PROPOSED OR IMPLEMENTED

Due to its small land area, San Francisco has a finite number of streets and is unable to expand its road network and spread traffic congestion over a larger area. Since San Francisco has no room to expand its current street system or build new roads, the city must expand transit capacity in order to accommodate growth. A proposed solution to expand capacity on the N-Judah



Map 4A: N-Judah current transit stops La Playa & Judah to Irving & 4th

Map 4B: N-Judah reimagined transit stops on the same route

is converting the J-Church Muni Metro line into a Historic Street Car line. The J-Line has the lowest ridership of all of the LRV lines in San Francisco at 16,695 daily boardings (SFMTA, 2007). The level of ridership on the J-Line could be accommodated by a Historic Street Car. The J-Church has almost 2,000 less daily riders than the existing F-Market & Wharves Historic Street Car (SFMTA, 2007). The low level of ridership is most likely a result of the J line's close proximity to the Mission Street Tunnel of the BART subway system and the Muni Metro Market Street Tunnel. For half of its surface operation, the line runs within a half of a mile from the BART subway, and within one third of a mile from the Market Street Subway. For the other half of its surface operation, the J-Church runs directly adjacent to the BART subway line from 30th Street until the J-Church's terminus at the Balboa Park BART Station.

The portion of the J-Church line that runs in the Market Street Tunnel could be rerouted onto the surface of Market Street. Inbound on Church Street the train could make a right turn on to Market Street instead of continuing north on Church Street and entering the Duboce Tunnel. The J-Church not entering the subway would free up capacity in the tunnel. The increased tunnel capacity could be used by the N-Line. The J-Line could use the tracks used by the F-Line on Market Street. Since it would no longer need to use vehicles capable of subway operation, the J-Church could use refurbished historic street cars that already exist within Muni rolling stock. The LRVs that the J-Church is currently using could be used by the N-Judah in order to increase trip frequency. Though this solution has the most potential effect in increasing the capacity of the N-Judah, its implementation would be highly politically contested because adding sixteen thousand daily transit trips to Market Street would greatly decrease its Level of Service (LOS) for all modes. The decrease in automobile LOS would most likely be the most political. This option is low cost as it would only require adding track to allow the J-Church to turn on and off of Market Street, and reassigning existing rolling stock.

Bulb-outs have been implemented by the city to expand capacity on sidewalks where a large number of passengers waiting for the N-Judah have greatly decreased sidewalk capacity. A bulb-out is a curb extension that has historically been used as a traffic calming measure in which narrowing the street encourages automobile traffic to slow down. The San Francisco Planning Department began using bulb-outs in order to eliminate the need for buses to pull up to the curb and fight their way back in to the flow of traffic after picking up passengers. Recently San Francisco has begun using bulb-outs to create a larger side walk space for N-Judah passengers at the lines busiest stops. On January 18, 2011 the SFMTA approved bulb-outs at Carl and Stanyan, and Carl and Cole. A bulb-out has also been implemented at 9th and Irving (SFMTA Board Agenda, 2011). Bulb-outs have replaced a previously used model to alleviate sidewalk capacity issues called a boarding island.



Map 5: Rerouting the J-Church onto Market Street

At boarding islands passengers wait on an above grade median designed to accommodate passenger queuing. Bulb outs do not disrupt the flow of traffic, but decrease shoulder area used for parking spaces.

Signal Prioritization is another solution to alleviate the N-Judah's problems. "On-board and wayside signals detect transit vehicles approaching an intersection and give them signal preference by preempting the normal signal cycle to extend the green light" (San Francisco Municipal Railway, 2002, p. 11). Furthermore, when the train approaches a red-light the signal is tripped in order to give the train priority to clear the intersection, while other modes of travel wait. This decreases travel time because the train is not spending time waiting for a green light at signalized intersections. This is cur-

rently implemented at four intersections on the surface portion of the N-Line: Duboce & Church, Irving & 7th, Irving & 9th, and 9th and Judah.

A process referred to as Switch-Backing reduces the incidents of several N-Judah trains entering the subway tunnel or arriving at transit stops in immediate succession. Switch-Backing occurs when two or more outbound trains become backed up on the surface. The least full train will unload its passengers who will then board one of the other trains in the group that is backed up. The train that unloaded its passengers will then switch back to an inbound track and head back Downtown. There are currently five locations along the N-Line that allow the trains to Switch-Back. The procedure is mostly implemented at 19th Avenue and Sunset Boulevard. Muni post instructors will occasionally preemptively switch back a train that is not in a group of backed up trains if it sees a problem developing. This often leaves passengers stranded on the sidewalk waiting for the next outbound train.

Supplemental Service is another solution to the problems faced by the N-Judah. Supplemental Service is defined as adding an additional mode to an existing transit line to reduce capacity pressures or increase run time. In June of 2011 Muni added a Supplemental Service to the N-Line called the N-Judah Express (NX) (SFMTA, 2011, p. 2). The NX is a bus that makes regular inbound stops from the N-Line's origin at Ocean Beach to 19th Avenue. After passing 19th Avenue the bus makes no additional stops and heads directly to the financial district where it terminates in close proximity to the Montgomery Station of the Market Street Tunnel. There are additional NX buses proposed for the Inner Sunset and Cole Valley neighborhoods (CAC, 2011). Multiple studies show that the NX is a longer commute option than the N-Judah train (Reset SF, 2011). The NX has a weekday ridership of 1,372 which amounts to only a small portion of the 45,252 daily boardings on the N-Judah line (SFMTA, 2011, p. 5). The NX only accommodates commuters headed to one section of downtown. The NX has had minimal effect on the commute time and capacity of the N-Judah. Ultimately the NX is a step backward that negates the purpose of having a light rail system in that it is designed to discourage use of the light rail train in favor of bus transit.

POSSIBLE FUTURE PROBLEM SOLUTIONS

Undergrounding the N-Line between the Sunset Tunnel and the Duboce Tunnel is a possible solution that should be explored for the future. Inbound the train currently exits the Sunset Tunnel, runs along Duboce Avenue for .2 miles and then enters the Duboce Tunnel. "Not only does the train mix with traffic in this segment, the train must slow down to emerge from one portal and re-enter the next one" (San Francisco Municipal Railway, 2002, p. 32). The neighborhoods in this area are already served by the Church Street Station of the Market Street Subway. The N-Judah makes two stops on the .2 mile stretch of Duboce Avenue it runs along. The Duboce and Noe stop is located less than one third of a mile from Church Street Station and the Church and Duboce stop is located one tenth of a mile from Church Street Station. It is projected that undergrounding the Duboce portion of the N line would only cost 182.7 million dollars to implement (San Francisco Municipal Railway, 2002, p. 32). "Building a subway for this stretch would greatly improve its reliability and shorten its travel time noticeably" (San Francisco Municipal Railway, 2002, P. 32).

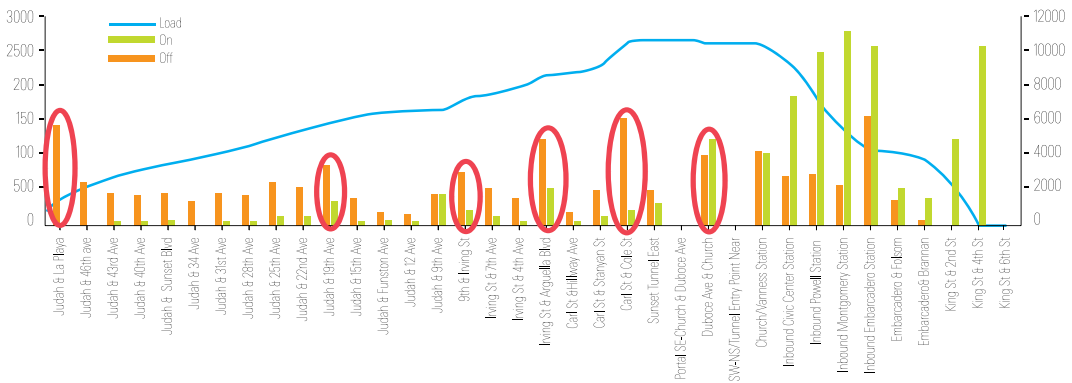
“A physically separated right-of-way is... effective at protecting transit vehicles from congestion and allowing them to stay on schedule” (San Francisco Municipal Railway, 2002, p. 9). Currently along Judah Street the N-Line is separated from traffic via a solid white line, diamond lane markings, and signage indicating that diamond lane use is reserved for Muni vehicles. The diamond lane does allow for legal left hand turns. Due to the lack of visual and physical separation the diamond lane is typically not observed by automobile drivers. Automobile use of the diamond lane, coupled with legal left hand turns makes the diamond lane ineffective. The best way to effectively physically separate the N-Judah from traffic is a raised right-of-way that would put the N-Judah’s surface portion tracks on a raised median, separated from the normal flow of automobile traffic. This would minimize conflict between the N-Judah and automobiles. A raised right-of-way would also minimize the time the N-Judah spends in congestion. A raised right-of-way prevents cross traffic at low volume intersections. The N-Judah would still have at grade crossings with major streets. The decrease in cross traffic would safely allow for the train to travel at increased speeds. These increased speeds would allow for timely arrival of street cars at transit stops. There are currently two segments of the N-Judah operating on a raised right-of-way. The N-Line segment that runs from the Embarcadero Station to the CalTrain Depot operates on an exclusive right-of-way that is separated from traffic, and has above grade boarding islands that allow for boarding and offloading without the use of steps.

*“The N-Judah currently makes
twenty-four stops over 3.4 miles
of surface track.”*

In 1975 in preparation for the new Muni Metro subway and new streetcars, Muni began to develop physically separated and reserved rights-of-way for the surface portion of the N-Judah (Perles et al, 1981, p. 226). Many of the same activists who were involved in the Freeway Revolts a few decades earlier spear-headed support for the development of the rights-of-way (Perles et al, 1981, p. 226). The first segment was built between 19th Avenue and 9th Avenue along Judah Street and was dubbed the Super Track. New tracks were laid on a four-inch raised median that blocks cross traffic at most intersections. The Super Track has colored concrete treatments which visually separated it from asphalt. The visual-separation coupled with the raised-separation highlight the prevention of automobile use on the rail right-of-way. Initial support for the Super Track was drowned out by local residents protesting that they could not turn in and out of their driveways. Worried that customers would not be able to access their businesses, the business community joined in the protest (Perles et al, 1982, p. 227). The Super Track along Judah Street between 19th Avenue and 9th Avenue was the only segment ever built. The raised right-of-way between 19th Avenue and 9th Avenue has a faster travel speed than other portions of the line. The distance between these two stops is the same distance between the Sunset Boulevard and Ocean Beach stops, but the travel time between 19th Avenue and 9th Avenue

takes almost half as long as the travel time between Ocean Beach and Sunset Boulevard (Balitactac, 1998, p. 16).

Stop Optimization will decrease total travel time on the N-Judah line. Stop Optimization is defined as wider stop spacing which allows transit vehicles to make fewer stops on a route, reducing overall travel time (San Francisco Municipal Railway, 2002, p. 11). The N-Judah currently makes twenty-four stops over 3.4 miles of surface track. This equates to a stop every .14 miles. Intelligently dispersing stops over the surface portion of the line, focusing on retaining the most heavily used stops, would greatly reduce travel time and gross dwell time over the line. Stop optimization would have the greatest benefit for commuters and passengers headed Downtown. Local traffic could be accommodated by converting the existing NX buses into Local Buses that run the length of the surface portion of the line, making stops every block.



Graph 1: The majority of N-Judah surface portion boarding and off-boarding occurs at six key stops (circled in red).

The majority of surface-portion passenger boarding and unloading takes place at six key stops: Judah & La Playa, Judah & 19th, 9th & Irving, Irving & Arguello, Carl & Cole, and Church & Duboce (Plate VIII). These stops would be the ideal stops to retain if stop optimization is pursued. Additional stops could be added between Judah & La Playa and Judah & 19th to accommodate the large distance between the two stops.

FUNDING SOURCES

Implementation of the solutions proposed to alleviate the problems on the N-Judah would require a large amount of funding. There are several revenue sources that could be utilized. An Assessment District could be formed in the neighborhoods that would benefit from a faster and more reliable N-Judah. An Assessment District allows the government to assess a tax on property owners within a specified district. The cost of the tax to property owners would presumably be offset by an increase in property values that would result in the effected neighborhood's ease of access to Downtown employment and recreation opportunities. The Assessment District formed in the 1920s to pay for the Sunset Tunnel consisted of the length of Judah Street

bounded by Kirkham Street to the South and Lincoln Way to the North, in addition to the entire Inner Sunset (Perles et al, 1981, p. 91). An Assessment District to pay for proposed improvements should also include the Cole Valley and the Duboce Triangle neighborhoods as they would also receive a high amount of benefit from the improvements. Implementation of an Assessment District would most likely be politically difficult because of the higher proportion of automobile ownership among owner occupied housing.

Another possible source of revenue to pay for proposed projects is an increase in parking fees both at parking meters and fines for parking illegally or in undesignated areas. The number of parking meters within a quarter of a mile from the surface portion of the N-Line is negligible. There is a minimal amount of parking restricted zones within close proximity of the line. Paying for proposed projects with parking fees would most likely only be effective if it was initiated city wide.

Upgrades to the N-Judah would allow for Sunset District residents to travel Downtown easier and would encourage Downtown residents and tourist to frequent Irving Street and Cole Valley shops. This would result in benefits for the city's business community. Therefore increasing the city wide commercial property tax is an option to pay for improvements.

Improvements to the N-Judah would have positive effects on residents of San Francisco who own automobiles. The increase in capacity on the N-Line would encourage new transit ridership and decrease vehicle traffic and congestion on city streets. A decrease in traffic and congestion would increase automobile LOS and allow for increased automobile travel speeds. Benefits to city automobile users could possibly warrant the implementation of funding measures that affect all city automobile owners such as a Gas Tax, or an increase in vehicle licensing fees. Automobile users bearing the cost of improvements that have the largest benefit to transit riders using N-Judah would most likely result in making the issue more political.

CONCLUSION

The N-Judah has been the busiest transit line in the city of San Francisco since 1956. N-Judah trains are almost always crowded far beyond capacity during AM and PM peak travel times, and often at other times throughout the day and evening. Passengers experience delays and service is unreliable. The N-Judah's "travel time and reliability are impacted by a congested operating environment and long dwell times on crowded vehicles" (SFMTA, 2011, p. 2). Even though the problems of the N-Judah are well known within the transit community, implementation of change on the line has been slow coming. This is the result of a politically polarized city. The residents and leaders of San Francisco need to find the political will to effect change on the N-Judah line. This is more important than ever as the city has reached its highest population in its history and continues to grow. Population growth has led to an increase in traffic and congestion that will only worsen as the city grows. The N-Judah, which bisects the city roughly in half, will continue to experience problems with overcapacity, decreasing travel speeds, and poor schedule adherence and reliability as the city continues to grow.

The measures that have previously been implemented to increase capacity, reliability, and travel speed, as well as decrease travel time and dwell

time on the N-Judah Muni Metro line amount to a bandage. Further implementations within the same paradigm will only mildly alleviate the N-Judah's problems in the short-run.

The most effective short-run solution for Muni to pursue in order to "fix" the N-Judah is to reroute the J-Church on to Market Street, convert J-Church operation to a Historic Streetcar, and use the J-Church's LRV cars to increase trip frequency on the N-Judah line. This still only amounts to a short-term solution. As population and ridership increase, the increase in cars on the N-Line will eventually hit the same capacity issues that the line is facing today. As the population of San Francisco continues to grow, long term solutions for the N-Judah must be explored.

The most effective long term solution to alleviate the reliability and capacity issues faced by the N-Judah is to expand the lines below surface operation by converting the Duboce portion of the line in to a Subway, increase speed and travel time on the surface by decreasing the number of stops that the train makes on the surface, and give the train exclusive right-of-way via raised track on the surface. The raised track should be an extension of existing Super Track and be accompanied by above grade boarding islands that decrease loading and unloading times by eliminating the use of stairs. UA



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Occupy:

The Backlash to Voter Disenfranchisement

Chris Morris

In the past few years we saw the collapse of the housing market and the failure of many of our top financial institutions. It was a recession which was hard felt across the country. In 2011, we saw one of those tipping points begin in the world. In the middle east you saw the Arab Spring disposing many long standing dictators. In west it was a bit different, we had the occupy movement. Characterized by the popular phrase “we are the 99%,” a movement of people who had had enough of the “1%” holding the majority of the wealth and the everyday people losing out. In the following piece the author will take you to the situation of voter disenfranchisement which lead to people saying “that’s enough” and building a movement against the wealth inequalities.



Across the nation a unanimous voice has arisen to ensure an equal opportunity to "...life, liberty and the pursuit of happiness (U.S. Declaration of Independence)." The Occupy movement represents a contingent of America that does not believe they have the opportunity or representation to attain that which Thomas Jefferson proclaimed to be unalienable rights. The lack of representation in the governmental process is at the heart of the Occupy protests message. Citizens of the Occupy movement see a political structure that increasingly caters to slim percentage of affluent and well-connected individuals over the majority of Americans. Potential voters are not prohibited by any single law from voting, but handicapped by the lack of resources needed to actually vote. Potential voters are further marginalized due to implemented policy decisions that characterize the values of those that vote. Actual voters possess the resources that meet the necessary criteria to fully take advantage of the "equal" opportunity to vote. As the resources of actual voters accumulate, the capital of potential voters is neglected and a positive feedback loop of voting trends and wealth develops. Potential voters are further aggravated by the idea that everyone has the same voting mechanism, without acknowledging that everyone may not have the means to operate that mechanism.

"We have assumed that voting is a costless act, but this assumption is self-contradictory because every act takes time. In fact, time is the principal cost of voting: time to register, to discover what parties are running, to deliberate, to go to the polls, and to mark the ballot. Since time is a scarce resource, voting is inherently costly." (Downs 1957, 265)

Those goaded by the recognition that "equal" voting opportunity does not equate to equal representation have taken to the street and coalesced to form Occupy. The Occupy participants and sympathizers contend that the current administrative structure has failed to include and represent the bulk of society and their values. Elected officials need to implement policy reform that will equip the majority to participate in the political arena and restore confidence in the representative system. Every citizen of the United States should be given an equal voice, not just a quasi-equal voting option.

VOTING IN AMERICA

The government of the United States is founded and purposed to unify the collective power of citizens. Checks and balances woven into the founding constitution ensure that America is less likely to become an autocratic government led by a single person, or an oligarchy of affluent elites who command the interests of the citizens. The government's role of enabling individuals the right to "life, liberty and the pursuit of happiness" is reliant on its ability to represent the interests of the citizenry. Interests of every entity are to be balanced without giving undue advantage over another. The foremost apparatus used to ensure equal representation is voting. Voting is the basic method that citizens can employ to shape a government that represents them. It is also necessary for the government to receive the input of voters to ensure that it is fulfilling its mission to ensure equal opportunities and representation.

VOTER DEMOGRAPHICS

It is important to consider the characteristics of individuals who do and do not vote. Voters tend to benefit from governmental representation, and share comparable education and economic traits. In examining the education and economic traits that are consistent among voters, the government can evaluate what necessary action should be taken in order to address and enable unrepresented non-voters to increase the likelihood of voting.

From a national outlook, those who vote and do not vote are determined by educational and economic criteria. Those individuals who do not vote tend to be low income, less educated or both. (Haspel, Knotts 2005, 560-573; Hillygus 2005, 25-47)

Due to lack of voting, the economic and educationally disadvantaged continue to be under-represented if not completely unrepresented in the political system.

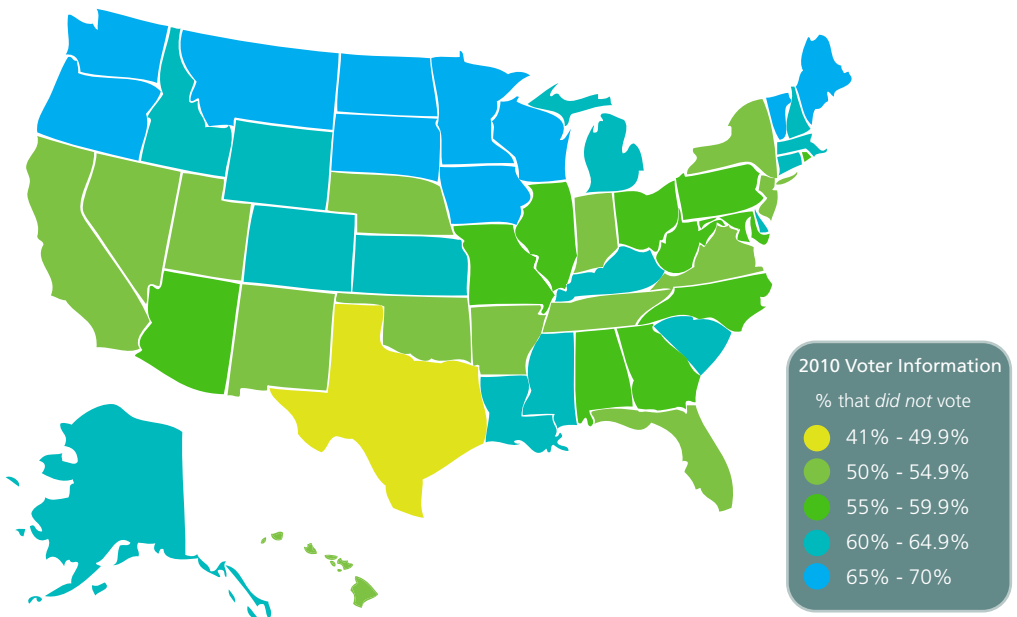


Image 1: Voter Participation by State.

Source: 2012 U.S. Census Bureau.

EDUCATION

One common characteristic in the likelihood of voting is whether one has received higher education. Education is a dominant characteristic in determining whether someone is likely to vote in the future. One potential reason is because most college degrees include some form of American history and governmental education. Knowledge of the general inner workings of government procedure could possibly give the necessary direction individuals need in order to participate in politics, ultimately increasing the likelihood that they will vote. (Larcinese 2007, 387-411) Associate professor of political science at Duke University, D. Sunshine Hillygus states

<u>Level of Education</u>	Total Citizen Population	Number Voted	Percent Voted	Number Did Not Vote	Percent Did Not Vote
Less Than 9th Grade	6,655	1,753	26.3%	3,706	55.69%
9th to 12th Grade, (No diploma)	15,931	3,911	24.5%	9,395	58.97%
High School Graduate	65,951	25,015	37.9%	29,523	44.77%
Some College or Associate degree	62,655	29,015	46.3%	23,786	37.96%
Bachelor's degree	39,272	22,646	57.7%	10,634	27.08%
Advanced degree	20,336	13,646	67.1%	4,062	19.97%
Total	210800	95987	45.5%	81105	38.47%

Table 1: Voting Participation by Education Level Source: U.S. Census Bureau, Current Population Survey, November 2010.

in her article, *The Missing Link: Exploring the Relationship Between Higher Education and Political Engagement*, that "... SAT scores and a social science curriculum are related to future political engagement, suggesting that the content of higher education, especially a curriculum that develops language and civic skills, is influential in shaping participation in American democracy." (Hillygus 2005, 25)

Containing 30.2% of the U.S. population, and being the largest portion, are those that have received a high school diploma. Of the largest portion of the U.S. population, only 37.9% voted. (Refer to Table 1). Graph 1 indicates that without further education, those who have a high school diploma are less likely to participate in the voting process in comparison to those with a higher education. Graph 1 also depicts the drastic correlation between voting percentages and education, with the line of those who vote increasing as education increases, and those who don't vote decreasing as education decreases.

It is clear that education, or lack thereof affects individuals, but it has also been documented that parent education affect the lives of their children. The article, *Family Matters: Impacts of Family Background on Educational Attainments* written by John Ermisch and Marco Francesconi states that "Parent's education attainments are found to be very strongly associated with their children's educational attainments, and for an important part of the population these associations can be given a causal interpretation." Not only does the lack of education affect voting trends in the current populace but of future generations.

INCOME

Another common characteristic in voting habits strongly correlates with the amount of income for a household. These characteristics can be studied in examining the income of individuals and how that affects their probability of voting. For families that made under \$10,000 annually, 62% did not vote. In

Family Income	Total Citizen Poulation	Number Voted	Voted Percent	Number Did Not Vote	Did Not Vote Percent
Under \$10,000	5,496	1,465	26.7%	3,406	62.0%
\$10,000 to \$14,999	5,069	1,512	29.8%	3,013	59.4%
\$15,000 to \$19,999	4,549	1,518	33.4%	2,552	56.1%
\$20,000 to \$29,999	12,632	5,103	40.4%	6,237	49.4%
\$30,000 to \$39,999	13,182	5,845	44.3%	5,979	45.4%
\$40,000 to \$49,999	10,807	5,300	49.0%	4,576	42.3%
\$50,000 to \$74,999	25,516	13,252	51.9%	9,680	37.9%
\$75,000 to \$99,999	17,597	10,164	57.8%	5,756	32.7%
\$100,000 to \$149,999	16,586	10,121	61.0%	4,777	28.8%
\$150,000 and Over	12,102	7,454	61.6%	3,353	28.8%
Total	154,410	73,628	47.7%	56,462	36.6%

Table 2: Voting Participation by Family Income

Source: U.S. Census Bureau, Current Population Survey, November 2010.

contrast to the families that made under \$10,000; the families that made over \$150,000 had a 27.7% faction that did not vote. Table 2 displays the trend that the higher an individual's income is the more likely that individual is to vote. There are many potential impacts that increased finances might play on voting habits. One reason could be that having more money would ensure a greater stability in lifestyle due to the ability to afford adequate housing, transportation and food. It is logical to conclude that an individual who has the basic needs in their life met, are better suited to devote the time and attention needed to research candidates, issues, and have the time to get down to polls. (Haspel, Knotts 2005, 560-573).

AMERICAN GOVERNMENTS CAN DO MORE

With voter turnout at 47.7% for the nation, both citizens and government need to work harder at making a government that represents the majority. The fact that the majority of citizens are not represented by the lack of voting depicts a systemic failure that cannot be completely blamed on the individual that chooses not to vote. It is also legitimate and necessary to ask the question why the individual chooses not to vote. Large swaths of lower income and less educated populations continue to be under-represented in the government. These populations become increasingly marginalized because of their lack of representation. Under-representation causes there to be a lack of aid and attention given to fix the issues plaguing these communities. The American government has a responsibility to examine the barriers that are causing these populations not to vote, and try to remove them in order to fulfill its goal of equal representation and promote genuine democracy.

CONCLUSION

The Occupy movement is a portion of American society whom has been united by their inability to engage in the political system and receive needed representation through voting. Frustration has mounted from Occupy supporters as the political arena has catered to a minority of the American populace with policy reform that has largely ignored the disadvantaged. Inequality is further provoked as those with less education and income are less likely to vote and are therefore unable to substantially impact policy reform. Assistance is needed to improve education attainment and income within struggling communities to assist the likelihood of voting. Confidence of representation in the government and the political system has eroded to a point where nation-wide protests have been implemented as a viable alternative to voicing inequity and achieving some sense of democracy. Critics of the Occupy movement state that the movement has failed to declare any clear agenda but this couldn't be further from the truth. The movement proclaims deafeningly, that regardless of voter disenfranchisement, those that have less will not be ignored. [UA](#)



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Visions from India

A Photo Essay by SFSU Alumna Jobelle Gacuya

After graduating with Urban studies and planning from San Francisco State University, I was given an opportunity from Professor Ashok Das to intern at a social enterprise for a year in North East India, (most unexplored region of India) in a state called Assam with a company called Cleanopolis. Cleanopolis is a first of its kind project using renewable energy for empowerment. My job is to design a research and training institute utilizing all recyclable and local materials. The area is also in a flood prone area due to monsoons, so another task at hand is to have it floating to demonstrate that with smart design it is possible to live anywhere in the world.



My interest in developing countries has always been there with me. I would always research and take classes dealing with planning in an international perspective. Learning about rapid urbanization and what it does to a developing country and the social issues that arise did not really hit me until I experienced it here in India with my own eyes. Living in India for about five months I have been traveling and observing everything I learned in class through my own eyes. How everyone from rural areas of the country move towards the bigger cities and how rapid urbanization is causing all these social issues that the country cannot even keep track of anymore. There are 1.2 billion people in India and almost half of the populations live in poverty. The gap between the rich and the poor is very extreme; I see it everyday in how the city and slums are formed all over Mumbai.


Living my whole life in America and seeing how the system runs there and then going to a developing country has its extreme differences. I have been to Mumbai and New Delhi and it's the most "City" life cities here in India. The same pattern is being made the tall buildings, parks, restaurants, night life, But if you drive 2 hours away from these cities or even go to another state you will see drastic changes and extreme poverty shack-houses with people who just want to make a living.





You see the same elements of cities in the world even in developing countries. With this rapid urbanization it is causing a great distinction for most of the population. The affect that the western world is providing for the rest of world is an enormous one. There is a growing trend of cities becoming more uniform, and we're seeing culture disappear within these bigger cities. More people are intrigued with the western activities that companies emulate and provide in these bigger communities.

One memory that I will forever take with me is visiting Dharavi, one of the largest slums in Asia. I came into Dharavi thinking that the energy there would be a morose one, but I was completely wrong. Dharavi had everything; it is a small city within itself. There were markets, bars, little shops to eat, recycling hub, a gym, leather goods shop, and etc. Anything you want you can get it in Dharavi. People were always on the move and very hard working. There were children playing in community garden parks. The energy level was strong and vibrant it was an amazing experience. Everyone welcomed us, the only thing that they needed was better sanitation. All the other aspects of life were met.

Overall, this experience has been a humbling one. To be able to see the lives of people with an entirely different culture and become empathetic to other people is an amazing feeling. Everyday I observe the innovative and entrepreneurial actions of the working people from India and how they create things with what they have, it's beautiful thing to see. It's been a journey and I am excited to see where the next adventure will lead me. 

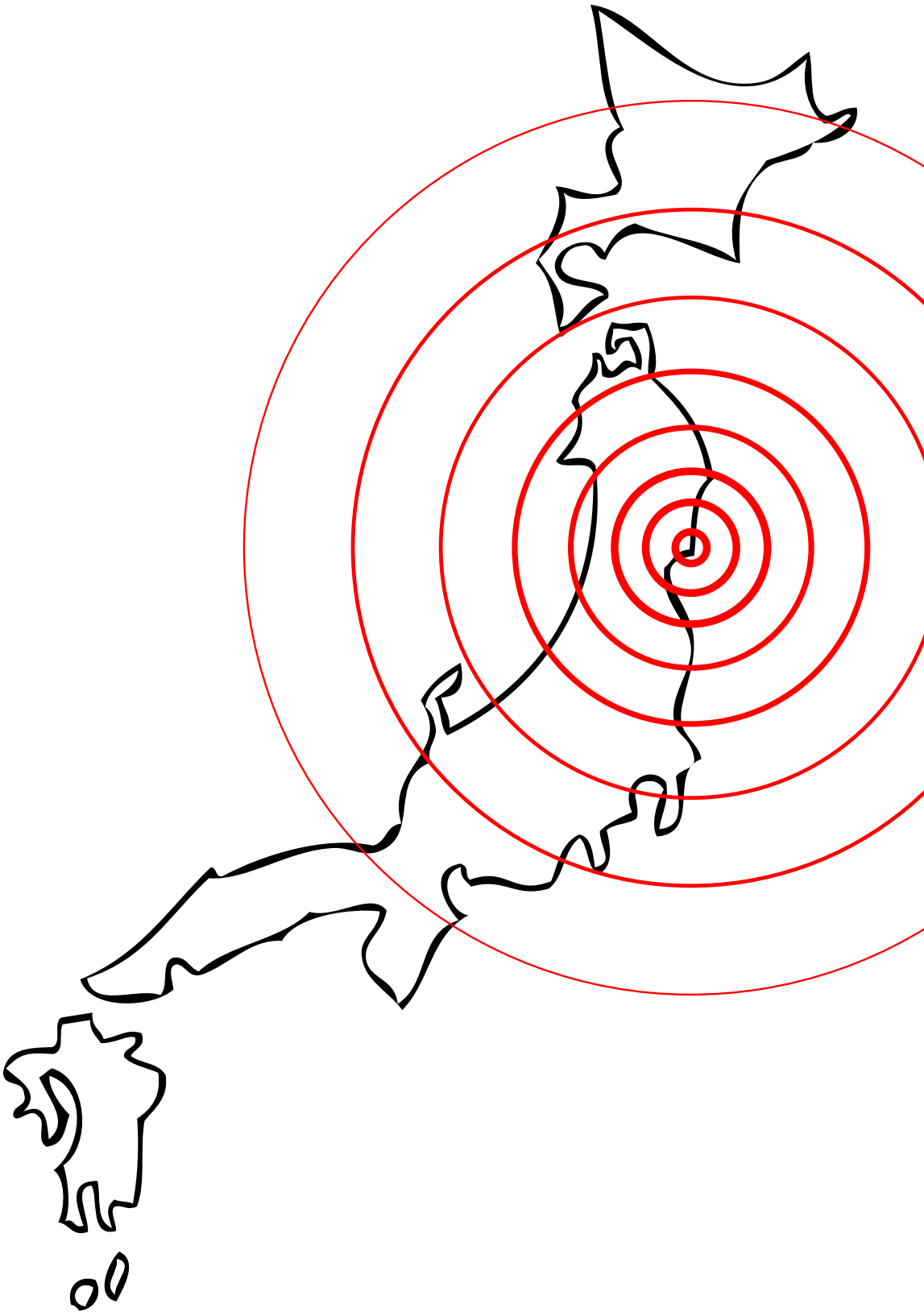




“There is a growing trend of cities becoming more uniform, and we’re seeing culture disappear within these bigger communities.”









Japanese Disaster

A One-Year Retrospective

T. Michael Liles

We can all remember March 11, 2011. The Friday we awoke to news of an earthquake which devastated Japan. A little over a year later we look back and are still dealing with the implications. In a time where it seems once a year the world is rocked by major natural disasters, the world opened its eyes to this the most. The developed nations of the world bore witness to other developed nation feeling the force of nature and it's impacts on modern infrastructure and the damages that impact can have. In the following piece T. Michael Lies will examine the consequences our modern infrastructure can have on the environment when everything does not go according to plan.

"In an age when man has forgotten his origins and is blind to his most essential needs for survival, water along with other resources has become the victim of his indifference."

~Rachel Carson~

INTRODUCTION

On March 11, 2011 at 14:46 local time (05:46 GMT) an earthquake registering a magnitude of 9.0 on the Richter scale shook Japan. The epicenter of the earthquake occurred in the Pacific Ocean, approximately 80 miles east of Sendai, Honshu, Japan (USGS, 2011). The earthquake resulted from thrust faulting on or near the subduction zone between the Pacific and North American plates (USGS, 2011). This thrust faulting caused a major tsunami to form with walls of water estimated to be as high as 10 meters (BBC, 2011). (See Figure 1.) The earthquake and tsunami caused severe damage to the Fukushima Dai-ichi nuclear power plant located 155 miles northeast of Tokyo. This paper will examine the environmental effects of the earthquake, tsunami, and Fukushima Dai-ichi nuclear power plant located in the Fukushima region of Japan. Recommendations are given regarding renewable energy sources as well as recommendations concerning geographic and schematic challenges surrounding the Fukushima nuclear power facility.

PROBLEM ANALYSIS

The underlying problem is the amount of energy consumption industrialized nations, such as Japan, use and the methods they select to provide this energy. Current methods of producing energy range from hydroelectric, nuclear power, renewable energy sources, such as solar, wind, and wave (water) power, and fossil fuel burning plants such as coal and natural gas (Spurr et al, 1986). Japan is unique in that it has very few natural resources to develop and must rely on extensive imports of oil, coal, and natural gas to meet the energy demands of the country.

BACKGROUND

The country of Japan consists of an assemblage of 2000 islands that extend across the eastern coast of Asia in the Pacific Ocean (U.S. Department of State, 2011). However, four primary islands Hokkaido, Honshu, Shikoku, and Kyushu support the majority of the population. The main island, Honshu, is the seventh largest island in the world with a total land mass consisting of 227,962 sq. km. Honshu is home to 60% of the total population with 25% of the population residing in Tokyo. Current population estimates for Japan are approximately 127,475,664 people and population estimates for Tokyo are 13.16 million people (Statistics Bureau MIC, 2010). The land mass of Japan consists of 364,485 sq. km with water adding an additional 13,413 sq. km for a total area of 377,915 sq. km (CIA World Factbook, 2011). In comparison, Japan is slightly smaller in total area than the State of California. California's total land mass is approximately 433,465 sq. km and has a total population of 37,691,912 (U.S. Census Bureau, 2010). This fact is important

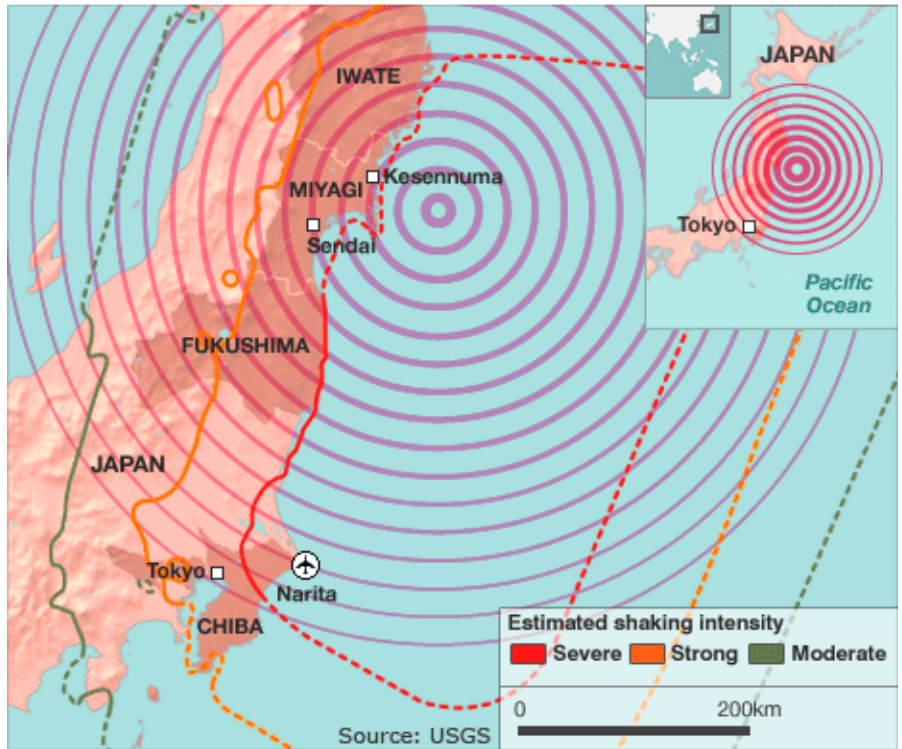


Figure 1: Areas Affected by the Earthquake 2011.

when considering alternative energy sources. Japan has a large urban population with a relatively small land mass that contains few natural resources. This presents a challenge when identifying alternative energy sources that meet the needs of the population without increasing imports of fossil fuels and utilizing large tracts of land.

One of the primary challenges that Japan has to address is the lack of fossil fuel resources available for energy production. There are approximately 60 conventional fossil fuel plants in operation. Primary energy generation for Japan stems from fossil fuel plants such as liquid natural gas (LNG) and coal. Currently, there are no active coalmines in Japan, yet 28% of electricity is generated using coal fired plants (Energy Information Administration, 2011). In fact, "Japan is the world's largest importer of LNG and coal and the third largest importer of oil" (Energy Information Administration, 2011). See Figures 2 and 3.

Nuclear power plants produce 24% of Japan's electricity with 54 plants in operation. With limited domestic fossil fuels available for consumption, it is easy to see why nuclear power has played such a pivotal role in energy production for the country. Economically speaking, costs associated with using nuclear power to generate electricity would appear appealing. Nuclear power could reduce cost by reducing the costs associated with conventional thermal electricity generation such as importing oil, natural gas, and coal. Primary costs associated with nuclear power plants would consist of importing uranium and other chemicals that are necessary for production.

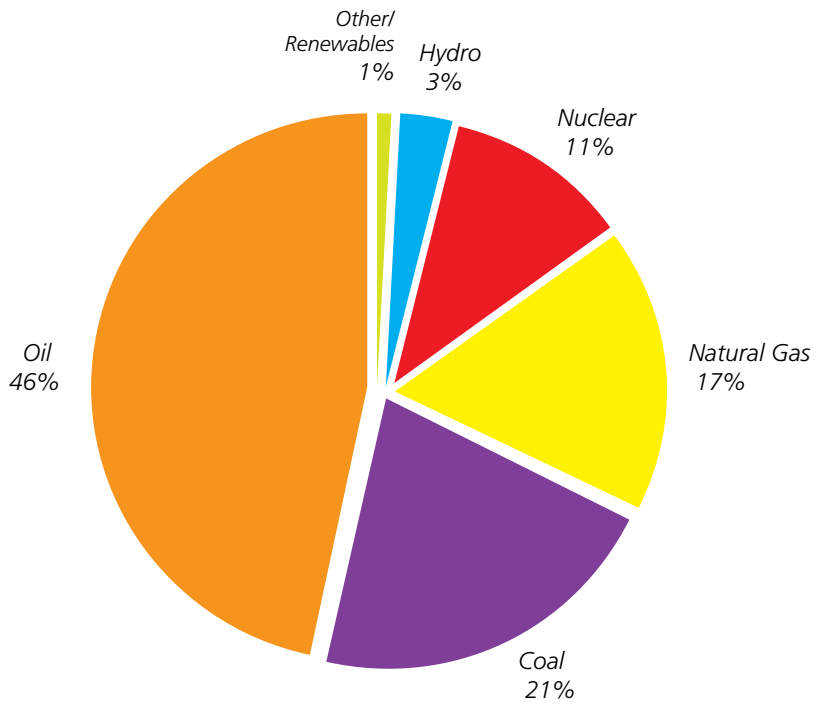


Figure 2: Total Energy Consumption for Japan, 2008.

Source: Energy Information Administration.

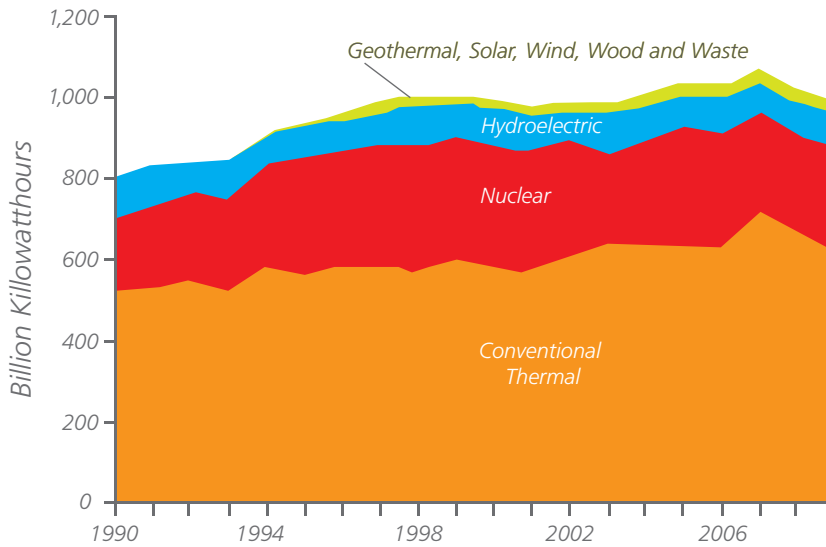


Figure 3: Japan's Electricity Generation by Source, 1990-2009.

Source: Energy Information Administration.

Other costs incurred would be plant construction and maintenance costs. Waste disposal is often a problem with nuclear power plants. However, waste disposal problems have been minimal because Japan reprocesses and recycles their spent fuel rods. Nuclear power plants would also reduce the amount of carbon dioxide (CO₂) emitted into the atmosphere. Although the costs of nuclear power might be appealing on a profit and loss sheet, the true costs associated with nuclear power plants are anything but economical. These costs do not include costs of decontaminating land and water, long-term storage of radioactive materials, loss of wildlife and sensitive ecological zone.

ASSOCIATED IMPACTS

Those immediately affected by the earthquake, tsunami and nuclear disaster are the people of Japan. Not only did they suffer immediate loss of family, friends and home but also thousands of acres of agricultural land contaminated with radiation. Samples of air, food, soil, tap and seawater are monitored daily for the levels of radioactive chemicals caesium (cs-134), (cs-137) and iodine (i-131). Since the disaster, food products such as spinach, beef, tea leaves, bamboo shoots, and shitake mushrooms have all shown high levels of cs-134/cs-137 and i-131 contamination (Ministry of Health, Labour, and Welfare, 2011). Five hundred and fifty four cows are known to have been fed contaminated rice straw and there is a lack of hay for grazing animals due to radiations exposure (BBS July 19, 2011). Foods such as raw dairy and turnips have also been banned for consumption and export (Guardian, 2011).

The total amount of farmland affected by the disaster has yet to be release. However, to gain a better understanding of the impact upon the region, we can look at the Northeastern regions agricultural and fishery outputs from 2008-2009. The Northeastern region plays an important role in rice, soy, marine aquatics, pig and poultry for the country. See Table 1.

Although the United States is located on the opposite side of the great Pacific Ocean, waves of destruction crashed against our shoreline. See figure 4. Others affected from nuclear fallout by this disaster also include marine life in the greater Pacific Ocean and other species, including humans.

The U.S. Environmental Protection Agency (EPA) has increased the number of air, drinking water, and pasteurized milk samples collected by Radnet between the dates of March 11, 2011 through June 30, 2011. Radnet is the United States of Americas radiation detection-monitoring network. According to their statics, trace amounts of radiation have been detected in air cartridges, precipitation, and pasteurized milk.

We can look at history to gain a sense of possible outcomes that might affect the wildlife of Japan and the greater Pacific Ocean. In 2004, Sumatra experienced a magnitude 9.15 earthquake and tsunami. Long-term effects from this natural disaster show relatively little damage to mainland wildlife, with more damage found on surrounding islands. Areas that were hardest hit in this situation were coral reefs and atolls (Goldman, 2011). Several small pacific islands were also affected by the tsunami. According to Pete Leary, a wildlife biologist from the U.S. Fish and Wildlife Service, the Midway Atoll and Wildlife Refuge has been hit particularly hard. "The U.S. Fish and Wildlife Service is estimating that the Midway Atoll Wildlife Refuge sustained losses of that more than 100,000 Laysan albatross chicks-repre-

senting 22% of chicks born this year-along with an estimated two thousand adults”(Goldman, 2011). Thousand of Bonin Petrels were lost as well as thousands of fish that washed ashore and died.

Unfortunately, the situation with the earthquake and tsunami in Japan will also have mainland effects due to radiation exposure from the Fukushima nuclear power plant meltdown. One of these effects is the use of toxic chemicals such as Boron, which is used to contain the fires that erupted in units 1, 2, 3, and 4. These chemicals will eventually make their way into parts of the Pacific Ocean and into ground water aquifers. Rivers such as the Abukuma River in the Fukushima region as well as Lake Inawahiro are located in the nuclear fallout zone and could contain high levels of nuclear contamination.

	All Japan	Aomori	Iwate	Miyagi	Fukushima	Ibaraki	Sum coastal prefectures	Share of total (%)
Marine fishery catch, metric tons (2007)	4,396,826	157,844	150,434	265,619	98,716	196,566	869,179	19.8
Marine aquaculture, metric tons (2007)	1,242,112	102,019	61,501	127,338	1,532	N/A	292,462	23.5
Agricultural output, 100 million yen (2007)	82,585	2,858	2,460	1,832	2,441	4,082	13,673	16.6
Crops output, 100 million yen (2007)	57,196	2,143	1,196	1,178	1,909	2,955	9,381	16.4
Vegetables, 100 million yen (2007)	20,893	680	276	273	551	1,538	3,318	15.9
Rice, metric tons (2008)	8,823,000	3,000,600	3,045,000	377,900	438,200	421,600	1,842,800	20.9
Soybeans, metric tons (2008)	261,700	6,720	6,130	16,800	4,860	7,190	41,700	15.9
Livestock & products, 100 million yen (2007)	24,787	714	1,265	651	525	1,058	4,213	17.0
Dairy cattle, head (2008)	1,533,000	15,100	50,700	26,100	19,500	32,200	143,600	9.4
Beef cattle, head (2008)	2,890,000	60,200	112,400	96,900	83,400	57,700	410,600	14.2
Pigs, head (2008)	9,745,000	402,800	425,400	221,800	200,400	631,700	1,882,100	19.3
Layers, 1,000 chickens (2008)	184,773	5,884	5,026	5,236	5,779	12,259	34,184	18.5
Broiler shipments, 1,000 chickens (2008)	629,776	38,228	98,668	11,074	6,120	6,540	160,630	25.5

Table 1: Agricultural and Fishery Output of Japans Northeast Region

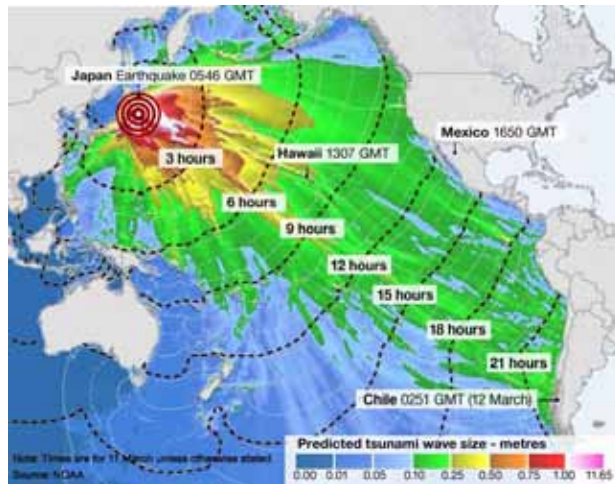


Figure 4: Radioactive Fallout Areas Affected by the Tsunami

The Ministry of Education, Culture, Sports, Science and Technology (MEXT) along with Tokyo Electric Power Company (TEPCO) are responsible for monitoring the marine environment. High levels of radiation have been found in samples taken from the seabed some 30 kilometers outside of Sendai. “Radioactive contamination of the marine environment had occurred by aerial deposition and by continuing discharges and outflow of water with various levels of radioactivity from the four damaged reactors at Fukushima Daiichii” (MEXT, 2011). This area happens to coincide with the habitat of the Mehikari fish. How will this affect the fish and the local marine biome?

Long-term effects from Fukushima are still too early to predict. Nevertheless, if we look at history again we can compare it to the 1986 Chernobyl disaster. How many human lives were lost? How many acres of soil contaminated? How many towns destroyed? What was the impact on wildlife? The current number of loss of human lives from the earthquake and tsunami hover around 15,000, and only one person has died from radiation poisoning. It is difficult to comprehend that only one person has died from radiation poisoning in the second worst nuclear disaster in the world’s history. However, there is no statistical evidence to prove otherwise.

It is difficult to assess responsibility for damage that occurs due to natural phenomenon. However, when one looks at the design details of the Fukushima power plant, several problems are apparent. Recall the basic geography of Japan as discussed earlier, such as the country’s location next to the Pacific subduction zone; also look at the history with respect to the number and the severity of earthquakes that Japan has per year. These geographic factors make the Japanese shoreline incredibly vulnerable to tsunamis and earthquakes. In addition, manmade breakers constructed around the Fukushima plant at a height of only 3 meters proved to be insufficient against the waves from the tsunami. See figure 6. In addition, improper placement of emergency equipment reduced efficiencies and increased the chances of a full meltdown. Backup generators located in the basement of the facility were easily flooded when breached by the tsunami waves. See figure 7. Ineffective human thought process is to blame; poor placement of a nuclear facility but more importantly poor engineering design.

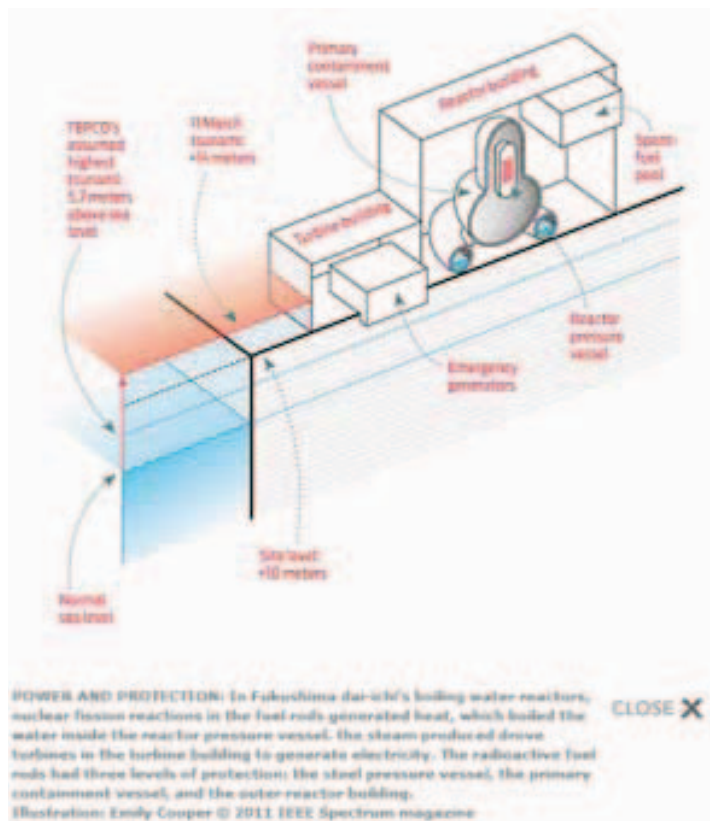


Figure 6: Design Problems with Fukushima Dai-ichi Nuclear Power Plant.

SOLUTION

Two primary renewable energy sources, solar and wind power could replace old and outdated conventional power facilities. Working with Japan's lack of domestic fossil fuel resources as well as respecting geographic restrictions allows for an excellent match. Replacing outdated conventional power facilities with solar and wind would greatly reduce import costs of fossil fuels. Not only would it reduce import costs, it would reduce the amount of CO₂ emissions.


FEASIBILITY

Challenges that arise from this are the amount of land available for large solar installation projects. Moreover, the amount of electricity that is necessary to power such a large population would still have some environmental drawbacks. Challenges surrounding wind installations would be flight patterns of waterfowl and other migratory birds. Additional information regarding water availability for human consumption and agricultural needs is necessary before recommending expanding hydroelectric power plants. In addition, examining possible implications for the utilization of wave power should be evaluated. Things to consider would be damage to the system by earthquakes, tsunamis and hurricanes, habitat of fish, fishery operations, and essential maritime activities.



Figure :7 Flooded Emergency Generators Located in the Basement of Turbine Building Unit 3

Opposition to these solutions would come from independent corporate power providers. Japan's electric industry is comprised of 10 privately owned companies such as TEPCO and Japan Atomic Power Company. These companies have regional monopolies over power generation and distribution (EIA, 2011). Moreover, costs associated with dismantling of conventional thermal and nuclear power plants would need to be calculated. If these corporations decide to change energy production methods dynamics of political and regional instability could occur. Other factors to consider would be social and cultural structures and beliefs found in Japan.

There is hope for the future of renewable energy sources in Japan. The Fukushima disaster has presented an opportunity for the Japanese people and other countries around the world that depend on nuclear power to learn from this disaster. Engineers, geographers, economists and politicians have an opportunity to work together to rebuild and alter the landscape of Japan by incorporating renewable energy sources. 

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Figure 6-7 Source: TEPCO courtesy of IEEE Spectrum Magazine Volume 48 number 11 November 2011

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San Francisco's Emergency Water Supply

Chris Brodeur

The threat of earthquakes is ever apparent in San Francisco with the city having witnessed two destructive quakes in the last century. One that destroyed most of the city and one that brought the freeways of San Francisco down. One of the major effects of the first was not the earthquake it's self, but the fire it caused after which burnt the city. With fire being such a threat the water supply on hand to combat the flames is a pressing issue. The following piece will explore the current situation of the emergency water supply in San Francisco and make policy recommendations about what can be done to improve the situation.



An in-depth analysis into San Francisco's emergency water supply system, known as the Auxiliary Water Supply System (AWSS), will be discussed in this report. Historical evidence will be presented to provide background to the creation of the AWSS. Evaluation of how time has taken its toll on its capability to supply enough water to suppress emergency fires will be explained. Also, exploration into potential alternatives to resolve the debilitated and run-down system is discussed in this report and the criteria to evaluate the costs and benefits of these alternatives.

The United States Geological Society (USGS) anticipates that an earthquake with the destructive force of the 1906 earthquake has a 63% chance of taking place before the year 2030 (USGS 2008). There would be an estimated loss of 150,000 Bay Area buildings as a result (USGS 2011). It is reported that 20-80% of these buildings would be destroyed due to conflagration, which is destruction by fire, caused by thousands of fires that would erupt in the wake of a major seismic event (ESER Bond Report 2010).

In the 1906 earthquake conflagration destroyed nearly half of San Francisco's structures (NY Times, 1906). Studies suggest that the massive destruction could have been averted if the government had responded to the recommendations of the Fire Chief Dennis Sullivan to create an emergency water system to put out fires.

The next major earthquake in the region exposed the disrepair and flaws of the AWSS. In 1989 the Loma Prieta earthquake caused liquefaction and conflagration that demonstrated how the AWSS is not capable of handling the amount of fires that result from a major seismic event. The destruction of the Loma Prieta earthquake in the Marina District of San Francisco provoked in depth analysis of the AWSS (Scawthorn 2005) and the reasons why it was insufficient in stopping the resulting fires. These studies found major disrepair in the system and made it apparent that a majority of the system would have to be replaced in order for it to properly function.

Problem Statement and Objective

There have been many governmental charters and provisions made to repair the AWSS since then, and yet 70% of the system still uses the original 1913 piping (ESER Bond Report 2010). The governmental failure to create a working Auxiliary Water Supply System threatens to cost the city \$60 Billion dollars in damages and could result in thousands of avoidable deaths (USGS 2011) in the event of a major earthquake.

The objective of this report is to determine an alternative that will create an efficient auxiliary water supply system for the city of San Francisco that is prepared to withstand seismic activity of high magnitudes. It is also an opportunity to evaluate alternatives that can develop a more structurally sound AWSS.

Methods

Gathering evidence for this report required looking into the structural damages of the AWSS and the factors that affected these damages such as previous earthquakes and liquefaction. Also, the US Geological Survey

“Fires had burned for three days straight making it the largest conflagration in United States history.”

(USGS) was a reliable and main source of the data collected. Maps of high hazard areas support the immediate need for San Francisco to act quickly in upgrading its water pipelines, especially in the event of a major earthquake. A conducted interview from a key insider offered insight to complement collected evidence. Information was also gathered from the different departments (stakeholders) within the City of San Francisco and their plans to incorporate system upgrades into the city’s general plan.

BACKGROUND

Construction of the San Francisco Auxiliary Water Supply System (AWSS, see Figure 1) came to completion in 1913 in response to the 1906 Earthquake of San Francisco. With a magnitude of 7.7, its force was felt from southern Oregon to Los Angeles and as inland as central Nevada. It caused an estimated damage of 3,000 deaths and \$524 million dollars in property loss using 1906 dollars (<http://www.sfmuseum.net/hist10/06timeline.html>). Furthermore, twenty-eight thousand buildings were destroyed in San Francisco after the earthquake. Despite the size of the earthquake, most of the damage created was due to the extensive fire that ensued afterwards and not from the earthquake itself (Scawthorn et. al, 2005). Fires had burned for three days straight making it the largest conflagration in United States history. The main cause for the inability to control the many fires that ignited throughout the city was due to the lack of an emergency water supply system water supply.

History

On April 18, 1906, when the earthquake hit, San Francisco had no high-pressure water supply network. The year before in 1905, Chief Dennis Sullivan of the San Francisco Fire Department (SFFD) had proposed for the city to purchase a fireboat but his request was denied. Not having a fireboat that could pump volumes of water from the San Francisco Bay was another deficiency that inhibited the SFFD from stopping the fires (Scawthorn et. al, 2005). The document published by the Board of Supervisors in 1907 (SFEFA 1906) described the issue in detail:

Several of the fires thus caused could not be subdued in their early stages, and soon passed beyond means of control. Had not the water supply been destroyed, it is probable that no serious loss by fire would have resulted. As it was, the City’s Fire Department was rendered practically useless.

(San Francisco Earthquake and Fire of April 1906)

In the aftermath of the disaster, the insurance industry pressured the city of San Francisco to develop a plan for a high-pressure water system like the one Dennis Sullivan had proposed. As a result engineer, Marsden Manson, proposed the Auxiliary Water Supply System (AWSS) in 1908 (Scawthorn et. al, 2005). The AWSS consists of a ten-million gallon reservoir; two pump stations supplying salt water from the San Francisco Bay; a pipe network connected to dedicated street hydrants; two steam fireboats; and underground cisterns that today totals 172. Owned and operated by the SFFD, the AWSS also supplements the municipal water supply system in both non-earthquake and earthquake scenarios.



Figure 1: Map of the Auxiliary Water Supply System in San Francisco.

On October 14, 1989, the Loma Prieta earthquake (7.1 magnitude) was the largest earthquake to hit San Francisco since the 1906 earthquake. It would test the AWSS's capability and fortitude and eventually show that structural improvements needed to be done. Sparking more than two-dozen fires citywide, Loma Prieta created the most severe damage in the Marina District. Many of the buildings collapsed due to liquefaction causing fires to increase. Liquefaction occurs when the soil in the ground is loose and saturated with water causing ground failure or displacement. It is triggered when the ground is shaken long and hard enough. Hydrants connected to the AWSS lost pressure due to many pipeline breaks, and were unable to contain the blaze. Five breaks along the pipeline system in the South of Market Area contributed to failure of the AWSS to produce high-pressure (Postel 1990). Fires were eventually put out with the help of the Portable Water Supply System (PWSS) and the Phoenix that pumped seawater consistently for fifteen hours (FEMA 2003). Nearly one hundred-years in age, the integrity of the AWSS demonstrated numerous vulnerabilities in the network that needed to be fixed.

The Applied Technology Council, an organization created by the Structural Engineers Association of California that engineers resources to mitigate the effects of natural hazards on the built environment, supplied a report in 2005 on the potential damage due to a future earthquake in San Francisco with the use of a well running AWSS. Their findings were that fire alone created by an earthquake will bring roughly \$8 billion in additional damage. Approximately 20%-50% of the damage will be due to fires. In 1906 without the AWSS the damage from fire destroyed 80% of San Francisco's Structures.

There is a 70% probability of a major earthquake with a magnitude of 6.7 or higher occurring within the next twenty years in the San Francisco Bay Area (See Figure 2). Those odds are highly increased in the city of San Francisco because of its location on the San Andreas fault line. The potential dangers that may occur if the city's emergency responders, specifically the fire department, is unprepared paints a disastrous future.

In 1987 Proposition A was passed with 89% of the vote appropriating \$46 million to extend and rehabilitate the AWSS, although this money was also split up to aid in retrofitting other fire facilities. Currently, the voter approved 2010 Earthquake Safety and Emergency Response Bond is the major source of funding for repairs to crucial parts of the AWSS. Though of the \$412.3 million in bonds appropriated by the city of San Francisco only \$35 million is allocated for capital construction and planning costs for projects involving the AWSS facilities and an additional \$32.6 million in pipe and tunnel replacement and retrofitting. The replacement cost is near \$20 million dollars per mile for the original pipes, which becomes financially unviable in terms of bonds already approved by voters or annual funding from the city. With this being the actual cost of repair, the \$46 million dollar bond is not sufficient funding for what appears to be a megaproject in the making.

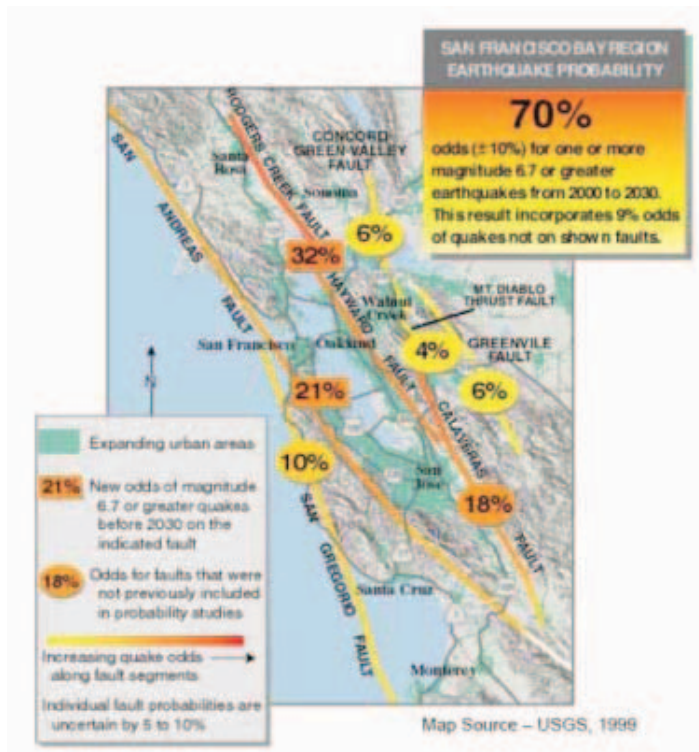


Figure 2: Faults – Potential Areas for Earthquakes.

ALTERNATIVES

Increase Government Oversight

The AWSS is maintained through yearly appropriations from San Francisco's Capital Plan and various bond measures passed by voters. With the AWSS falling further into disrepair every day that passes, it is imperative for the safety of San Franciscans that the repairs that San Francisco has paid for are performed efficiently and quickly. The issue of financial oversight and governmental responsibility is a major reason why the system is still dilapidated today. Either through the diverting of public funds to other purposes or governmental officials negligence, the repairs promised in the past have still not taken place. "In 2010 a financial boondoggle was passed under the guise of Proposition B" (Personal Interview, 2011) Says former District 7 Supervisor Tony Hall. He has served for over 35 years as a city administrator and for five years as a publically elected individual at city hall. His experience seeing "governmental corruption" has been first hand. "What the government machine has been about is extracting money from its citizens. San Franciscans are some of the most generous people in America, with our city budget being larger then twenty-two states in America. Let me ask you; is our safety infrastructure in any better shape then it was five years ago? No its not."

The bond measure that Hall was referring to was a measure passed in 2010 that let the city borrow \$412.3 million in order to "pay for repairs and improvements that will allow San Francisco to more quickly respond to a major earthquake or other disaster" (ESERB 2010). Why Hall referred to it as a boondoggle is because of how the city is going to spend the money. In the campaign to have to bond passed voters were showed images of burning buildings and told of the imminent threat of a massive earthquake, but what was not clearly expressed to voters was that only 6% of the bond would actually address the issues of the AWSS system. Hall points out how the purpose of the measure was to build a \$243 million dollar "Public Safety Building" in Mission Bay, where it only spent 67 million on repairing the safety infrastructure of the AWSS (ESERB 2010). "This is just another example of how the city uses voters to fund pet projects and sweetheart deals. The Mission Bay Public Safety Building uses \$243 million dollars of tax payers money to build an unnecessary building while the AWSS is no longer able to put out a fire." Hall explains that government officials diverting funds or passing unnecessary bonds is nothing new, it has been happening since a similar 1989 earthquake bond was passed to respond to the infrastructure failures demonstrated in the Loma Pieta earthquake where only the problems in the Marina district were addressed.

The negligence of San Francisco's government to properly maintain the AWS System will affect the city's ability to respond to the next major seismic event in San Francisco. In order to spend the money on appropriate improvements in the system, city government needs to change the priority level and money they spend repairing the infrastructure. The first step in doing this is to institute in the Capital Plan a progressive improvement agenda that would deal with the highest level of priorities first, and then systematically rebuild the entire system. What this would mean is a massive investment in the AWSS that could cost as much as \$20 million dollars for each one of the 135 miles of pipeline that runs underneath San Francisco, totaling \$2.7 billion dollars. According to Tony Hall this would require a reorganization of govern

“Is our safety infrastructure in any better shape then it was five years ago? No its not.”

ment taking away the ability of the mayor to control the money released from voter approved ballots like Proposition B. This would mean that monies would be earmarked for the AWSS and would not be allowed to be diverted to the general funds category of the city budget. The City needs to invest the money required to begin improvements on the AWSS, along with these investments need to come accountability, to ensure that the money is spent on essential facilities.

Portable Water Supply System

Since the creation of San Francisco’s Auxiliary Water Supply System (AWSS) other cities in similar seismic and geographical circumstances have looked into and introduced systems based on the AWSS. Two systems that have been used by West Coast cities include a saltwater pump system and secondly a Portable Water Supply System (PWSS). A saltwater pump system in Vancouver, called a dedicated fire protection system, uses two saltwater pumps to carry water throughout the downtown Vancouver peninsula and densely built areas south of the downtown in large pipe system. The idea of the system was to install an auxiliary water supply system in the densest areas to supplement the domestic system. This system relies on saltwater that the city of San Francisco tries to stay away from due to corrosion the pipes, which are used fairly regularly to fight fires during each year. If San Francisco’s AWSS was solely meant for emergency purposes, then this focus on water adjacent pumps could be more useful, but this would also fail to include fire protection in the middle of the city that increases in elevation to the point that pumping Bay water that far uphill would become difficult and unreliable.

The second system that is widely used outside of San Francisco is the Portable Water Supply System (PWSS). An example of this method is in use across the Bay in Oakland in lieu of a water pump system Oakland no longer uses. A PWSS is meant to pump water along the same routes that an AWSS would, only it would use fire hose and vehicles as pumping stations to tap into high-pressure pipes. These hoses and vehicles are by far cheaper than digging up and laying down specialized and more expensive piping, as a fire vehicle generally costs hundreds of thousands of dollars as opposed to official estimates of twenty million dollars per mile to replace underground AWSS pipes. Oakland’s PWSS vehicles also contain portable fire hydrants to connect the hoses along with valves to tap into pipes. One mile of large diameter hoses is also carried on the vehicles to handle the high pressure water. This system is practical because a system of pumps can be more easily deployed and maintained as it is above ground, flexible and more easily maintained.

The two systems described above could lead to a hybrid system that takes into account the high cost of replacing the current AWSS system and the political feasibility of funding and re-constructing the AWSS. This

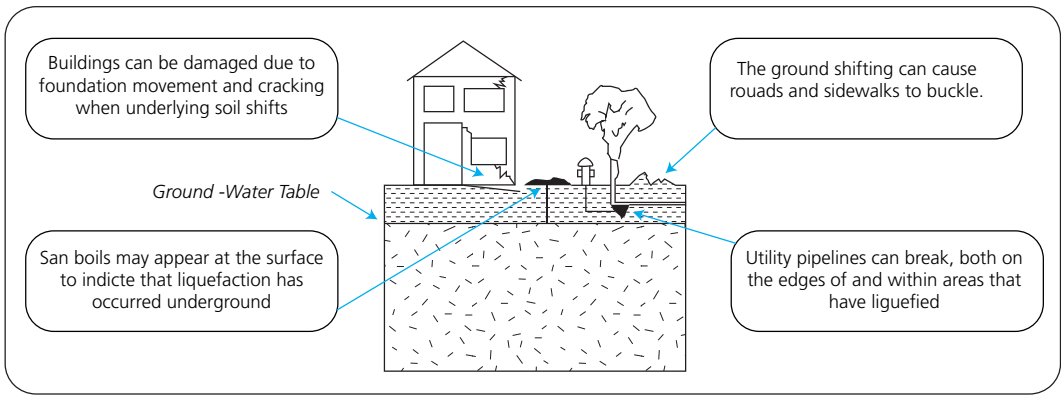


Figure 3: Potential Effects of Liquefaction.

hybrid system, mentioned in an official report, would still use a freshwater storage system and gravitational force to pump water downhill, but would consolidate the pipes into larger trunk lines that a potential PWSS could tap into. This would especially be useful in the northeastern section of the city where the density of piping is the highest in the city and piping could easily be consolidated into one of these “trunk” lines. These trunk lines would not even have to carry the full burden of the existing system’s capacity as a PWSS could tap into the pump stations, cisterns and ferries located on the Bay in case of an emergency. It is with these savings and logistical ease that a hybrid Pipe and PWSS could provide comparable service and reliability in regard to an alternative to full replacement of the AWSS.

Liquefaction Hazard Mitigation

In the event of an earthquake, utility pipelines are susceptible to leaks and breaks. Particularly vulnerable are water pipelines. Breaks are more likely in areas that have ground failures such as liquefaction (See Figure 3). Pipeline breakage statistics from the 1989 Loma Prieta Earthquake indicate that significant damage occurred in the areas highly susceptible to liquefaction (ABAG 2001). The number of water pipeline leaks per mile was four to six times greater than areas without liquefaction. And in the 1906 earthquake, liquefaction-related damage to the water pipelines prevented fires from being put out. It can be indirectly-blamed for 85% of the total damage to the city in 1906 (ABAG 2001).

Alongside the alternative to upgrade the AWSS, a plan must be made to mitigate a liquefaction hazard in result of a major earthquake. Currently, there are no known plans by the city in place to respond in such a circumstance. Figure 4 shows that San Francisco as a whole city has many areas, especially along its waterfronts, of high liquefaction hazard.

Continue with the Current AWSS Plan

A fourth alternative available is to continue the current course of action regarding the maintenance of our Auxiliary Water Supply System (AWSS). Reports in 1999-2001 testing the other domestic water system (the daily use system for San Francisco) showed the lack of ability to withstand a future

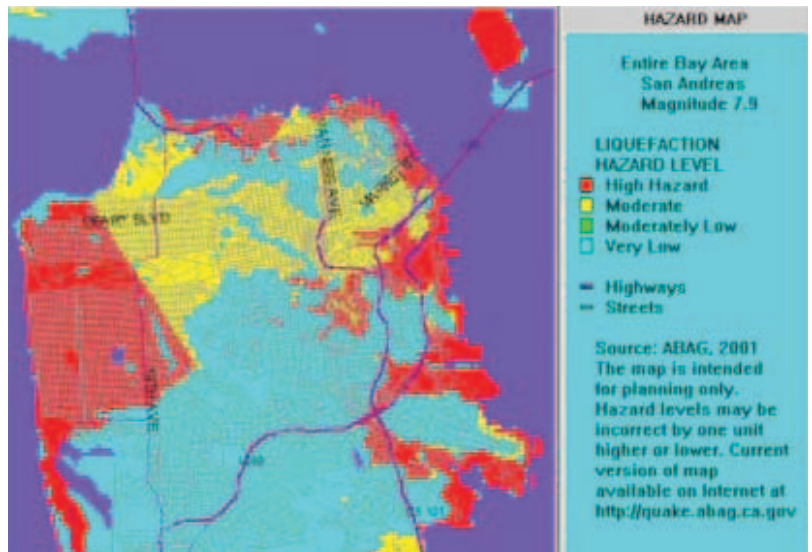


Figure 4: Liquefaction Hazard Map for San Francisco

earthquake without major failures. Therefore the importance of the stronger AWSS back up water supply system is critical in times of several simultaneous fires. The AWSS system is one of a kind in severe fire defense that has the ability to withstand earthquakes. Several cities in the western states have taken certain portions of the system as a model for their defense. Cities like Seattle, Oakland, San Jose and Los Angeles. The system does not need redesign but does need some maintenance due to ageing and some expansion due to urban development over the past 100 years from its inception.

EVALUATION

Alternative 1

This alternative will be difficult to assess because of the complexity of city governments. However, evaluation of increased government oversight will need to include a restructuring of those who are currently in office. In San Francisco, which is a strong-mayor government, the power held by this office needs to have limitations in place so that whoever is mayor does not have the power to divert funds as they please. Bonds issued must use the funding it generates for the specific purpose of that bond. Consequences should be set in place that if this is not ensured, it will be addressed immediately and seriously. Using this alternative may be the most cost-efficient because if government is regulated and are doing what they are supposed to by investing funds into infrastructure that is in necessary repair such as the AWSS, it will most certainly save the city money in the long-run and prevent it from a potential disastrous debt.

Alternative 2 –Saltwater Pumps

This alternative is similar to the replacement of the existing AWSS in that there would be the construction and placement of a pipe network. The cost would not be as staggering because the pipes in the original AWSS would

not be dug up, which would bring down some of the costs associated with the AWSS replacement. In terms of emergency preparedness this alternative would have some drawbacks compared to the original system as the pumps would be located by the water, which would force water to be pumped uphill and thus add another possible breaking point or loss of pressure in the supply line of water. This option would certainly work if it were a smaller coverage area such as the Financial district, but it would only be used in major emergencies because of the wear and tear that results from using saltwater in metal pipes unlike the existing AWSS which is used several times a year to aid in routine firefighting. Finally, the environmental impact of this alternative would be noticeable, as new pipes and pumps would have to be constructed and placed underground and at above ground access points. This would be less intrusive than replacing the existing AWSS, but would still prove to have noticeable impacts on the environment both during and after construction.

Portable Water Supply System (PWSS)

The PWSS system is a cheaper and more manageable alternative to fully replacing the existing AWSS or using saltwater pumps and will provide much better protection than a “no build” alternative. In terms of cost and financial feasibility this option fares better than fully replacing the system or installing new saltwater pumps. It accomplishes this by relying on regular mile long firehouses and water pump vehicles to move the water above ground. There is much less construction by relying on a few major pipe corridors that the PWSS would tap into. The other major financial advantage is that when these major underground pipes begin to get older, the replacement costs are much lower and maintenance costs would remain low for the life of the project due to the majority of the system being above ground as hoses that can easily be replaced. In terms of emergency preparedness this alternative does not fare better than the existing AWSS as the system is above ground and implemented by firefighters, so it would take time to not only coordinate where the pumps and pump personnel must go but also if the main underground pumps are still working and if the streets are clear. Physical obstructions in the roadway or at the fire stations housing these pumping vehicles and hoses would be potential hazards that take away time from implementing this PWSS in the event of an emergency. Finally, in terms of environmental impact this option would have the second smallest impact with the no build option having the least impact. There would be some piping that would need to be replaced or installed in the old AWSS, but aside from that the majority of the new PWSS would be located above ground and stored like any other firefighting equipment, causing very little disruption to the environment when the new pipes are placed.

Alternative 3

At the very least, this alternative should be set in place if nothing else is to be done. Currently, there are no current plans that formally address how to mitigate liquefaction hazards. The SF Planning Department may take an integral role in setting this in place as a part of their environmental safety measures. Implemented into their actual goals will ensure that there are efforts made to making it happen. It also will provide accountability for carrying it through.

“At the very least, this alternative should be set in place if nothing else is to be done.”



Alternative 4

The cost-benefit of this alternative is evaluated here. Most recently a proposal for a bond, 2009 Fire Protection System G.O. Bond, to fund the replacement, expansion and repairing of the ageing and corroded pipes in the AWSS system was put to the voters. The bond listed under Proposition B passed with 79% of the voters support on June of 2010 and repairs to the system are underway. The first Bond in the program for Earthquake Safety and Emergency Response Bond (ESER) Phase 1 provides \$104.2 million to improve two pump stations, two storage tanks, the primary reservoir, as well as associated cisterns, and a portion of the pipe network and tunnels. Currently the DPW submitted their September 2011 update on the ESER project. The first phase of assessments and planning for the AWSS are coming to a completion and construction will start shortly. However the budget has already shown estimates of exceeding limits by \$80,195 before any repairs have been made. The next phase will focus on upgrading and the fixing of the AWSS core. This core includes rehabilitation and upgrade of the critical portions of the system

that make the AWSS functional; two pump stations, two storage tanks, and the primary reservoir. In 1906 the earthquake did very little damage however, it was the inability to quickly respond to several fires that devoured over half of San Francisco's buildings. The loss due to fire was 80% of the total structural loss of the city. If we were to lose over half of our city now with a population of 805,235 we could expect to see over 400,000 people homeless. In 1906 the San Francisco population was 417,000 and 200,000 people were homeless after the quake. The cost of the overhaul project is far less than the cost of 400,000 refugees and the financial loss to structures and businesses.

One very possible outcome of this high cost project is that the funds will run out as they have in the past. The fire and emergency system already faces a \$42 million backlog of deferred maintenance due to lack of funds that needs to be addressed. This catch up on repairs will slow the process of completing the AWSS overhaul and consume a portion of the bond money. The Department of Public Works (DPW) will be watching over the budget allotted for this extensive ESER upgrade program. DPW will make monthly budget assessments available to the general public on their website. Other consequences will be traffic delays on roads that need to be closed due to the replacement of buried pipes. The majority of the piping is in the financial district that already has a congestion problem. The environment will be impacted with the additional noise of road construction and the turning up of dirt. Businesses will expect to see a loss in customers while access to their business is impeded.

RECOMMENDATION AND CONCLUSION

Analysis and research into the AWSS has proven that it could possibly be a megaproject if actual estimates of repairing it fully are to be acknowledged. Therefore, it is with great importance that proper planning of repairs is done before any work is to be implemented. Because of the enormous costs that repairs will incur, selecting an alternative that garners the most cost-benefit is integral as well as an alternative that has political feasibility. Otherwise, the AWSS repairs will continue to sit in limbo. Based on our criteria - cost and financial feasibility, emergency preparedness, and environmental impact minimized, our recommendation is a combination of Alternative 1 and Alternative 3. Increased government oversight is the key link in addressing the instability of the AWSS. The city's land as a whole is a liquefaction hazard. Having a plan to mitigate liquefaction when it occurs makes logical sense. Doing nothing would only add to the probability of increased debt and harm the city will face resulting from being unprepared. JA

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Poop, Sludge

Clean Water, Toxic Lands and Simple Solutions

Chantal Uto

The first time that biosolids came to my attention was about two years ago. My friend and I found out about the Big Blue Bucket Eco-Fair, a meet and greet of city services and partnering organizations. The event had a focus on water so it was only natural that it took place at the San Francisco Southeast Water Treatment Facility. Prior to the event attendees could go to the website and obtain a coupon for a complimentary bag of organic biosolids fertilizer. There I met representatives for San Francisco Public Utilities Commission, Literacy for Environmental Justice, Friends of the Urban Forest and other groups. It had a festival atmosphere with a sustainable slant. Although it was the highlight of the event for me, it was a fatal mistake for the sponsors. It was during that tour that I got my first dose of reality on our insanely inefficient wastewater treatment industry. The tour did not serve the intended purpose of quelling any concerns, which up until that point were largely absent. On the contrary, it roused suspicion. What was in those bags of free fertilizer... In this essay I will examine the origins of our sewage system to provide deeper understanding of the environmental and social implications that have manifested from the creation of sewage sludge.

Our sewage system has not always been like this. Even now, there are people in America who have never had a flushing toilet in their home. So why is it so ingrained in our culture that it is normal to do our business in drinking water? Industrialization. As cities grew and disease followed, waste became an urgent concern. In the 1800's there was an emphasis on cleanliness that propelled the radical shift from localized waste management (outhouses, bed pans, washbasins, etc.) to municipal sewage systems. This shift did not occur over night, "...the first water closets patented in America in the 1830's were not connected to a plumbing system, and environmentally they were little different from the hole-in-the-ground outhouse" (Lupton 28). We allowed our sanitary needs to be co-opted by a newly emerging industry focused on the aesthetics of the bathroom, the industrial sector's need for chemical waste disposal and the American obsession with growth and "modernization". John Stauber explains in his book, *Toxic Sludge Is Good for You: Lies, Damn Lies, and the Public Relations Industry*, that the most sustainable approach to urban sewage would have been to separate industrial waste from household waste. "Biological waste should have been recycled through a system that returned their nutrients to the soil, and businesses should have been required to separately treat their chemical wastes on-site so that they could be contained and re-used within the industries from which they came." As manufacturing techniques improved and clean water became more accessible, techniques in waste management did not similarly improve. There was a push to get households and industry alike hooked up to municipal water and sewage lines without a thorough examination of the consequences.

A hundred years ago, less than half of all American households were hooked up to municipal sewers, however, today the average American would scoff at the idea of living in a house disconnected from the sewage system and without a septic tank. Watching everything from food, tampons, household chemicals, expired pets not to mention the "usual" natural suspects, has come to symbolized modernity, civility and convenience. What once stemmed from a legitimate need for a sanitary means of biological waste disposal in growing cities transformed into a desire and then a right for all Americans regardless of necessity. Rural households as well as urban have municipal hookups because there is a perception that as Americans we are too civilized, too developed to personally handle our own waste. As other nations have developed, they emulate our government, our culture and our infrastructure, perpetuating our inefficient, unsustainable system globally.

Not surprisingly, our mad dash to emerge as the worlds most civilized country has had severe consequences. While city planners and officials knew that raw sewage was being diverted directly into open bodies of water, people were less aware or at least trusted that there was no harm in doing so. By the sixties and seventies the environmental movement was underway and people were starting to demand a solution to their polluted waters. In 1972 the Clean Water Act (CWA) was established, requiring "...communities to make sure that by 1977 their sewage plants could remove at least 85 percent of the pollutants passing through them, and allocated funding to pay for the additional treatment and filtering technologies needed to achieve this goal" (Stauber 103). In subsequent years funding decreased until it was almost nonexistent. As a result, we are left with the legacy of an unfunded mandate. We are required to extract pollutants from municipal sewage in order to have

cleaner water but have few resources to deal with the toxic byproduct, also known as sludge. Unfortunately, the cleaner we want our water, the more sludge we produce.

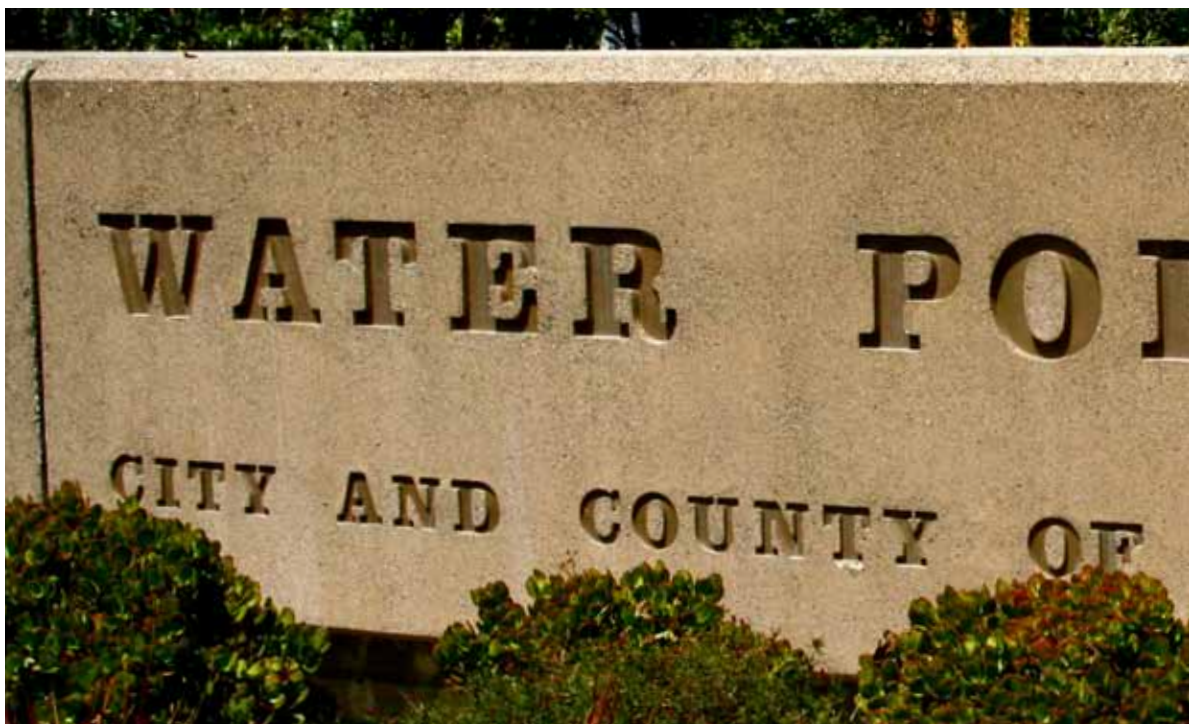
PROBLEM

While the CWA seemed like a huge success for environmentalists and concerned citizens, the real problem of pollution was swept under the carpet. Even in the Declaration of Goals and Policy, the problem is clear, the focus was too narrow; Sec. 101. (a) states, "The objective of this Act is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (Federal Water Pollution Control Act). By specifically protecting our nation's waters we allowed our pollution to be displaced to the land. The responsibility of administering and overseeing this law was granted to the Environmental Protection Agency (EPA), who should have been able to ensure the protection of our lands as well as our waters. However, that has not been the case because written into the law is an explicit statement that the EPA shall "encourage waste treatment management which results in the construction of revenue producing facilities..." (Sec. 201 (d)). As a result, what was formerly known as sewage sludge has been rebranded by the EPA as "biosolids." The EPA defines biosolids as "the nutrient-rich organic materials resulting from the treatment of sewage sludge." However it uses the words interchangeably, causing confusion. Under Title 40 part 503 of the EPA Standards for the Use or Disposal of Sewage Sludge, where it formerly read "Sewage Sludge" now reads "Biosolids" in brackets. Are they the same thing or not?

"With the population expected to grow to twelve million by 2050, we desperately need a sewage system reform."

The problem here is not a question of whether sewage sludge and biosolids are the same thing, but the system as a whole. A system that creates millions of tons of toxic waste that pollutes our lands in order to prevent pollution of our water and subsidizes industrial waste management is inherently flawed, not to mention the fact that a profit is made from this. In accordance with EPA regulations, there are three options that municipalities can choose from to dispose of sludge: incineration, landfill, and sale of sludge as fertilizer. Of these three options, none are viable for the preservation of our environment. This system has never been a viable option, but there are even more pressing factors in the 21st century that make this such an urgent issue, yet one that is rarely discussed.

On October 31st, 2011, the United Nations announced that the world population had reached seven billion. While they celebrated the new milestone, they also used it as a "call to action to world-leaders to meet the challenges that a growing population poses, from ensuring adequate food



and clean water to guaranteeing equal access to security and justice." The article, published at the UN News Centre website, with no discernable author, offered little attention to the environmental challenges that await, short of mentioning that they exist "with varying degrees of severity." With over half of the world population living in urban areas, another recent milestone, the US alone produces "7 million dry tons per year" (Twigg) of sewage sludge. Although it is difficult to estimate the total world production of sludge, one can speculate that most developed countries produce the same amount in proportion to their population. With the population expected to grow to twelve million by 2050, we desperately need a sewage system reform.

While anyone with a calculator can figure out that the numbers are stacked against the system, scientists are discovering the environmental implications. With the three limited options for sludge disposal, and none being particularly environmentally friendly, the most common is land application. According to the EPA website's Frequently Asked Questions page on "sewage sludge (biosolids)... about 50% of all biosolids are being recycled to the land." Recycling is defined as the "process of beneficially using treated residuals from wastewater treatment to promote the growth of agricultural crops, fertilize gardens and parks and reclaim mining sites". As a result of this wide spread "recycling" program, toxic chemicals are being found in unusual places at alarming rates. This epidemic is reminiscent of the DDT era and Rachel Carson's *Silent Spring*, which compiled extensive research on the negative effects of pesticides and their bioaccumulation in nature. Similar to benzene hexachloride, aldrin, endrin and pentachlorophenol, heavy metals, chemicals and pathogens found in sludge can bioaccumulate in plants, animals, and humans.



Numerous studies have been conducted on the practice of using sludge as fertilizers finding it to be a good solution to the problem. Further examination of these studies shows otherwise. One study concluded that sewage sludge was a good “organic” fertilizer because grass grew higher and yielded more dry matter. Despite elevation in pH and electrical conductivity it was assessed as an “environmentally sustainable option” (Ernesto). Another study concluded that heavy metal “concentrations were far below their permissible limits in edible fruits,” yet results indicated that Zinc and Cu concentrations were “extremely high compared to other metals” (Antonious). The study went on to say that the “marketable” yield was much higher compared to untreated soil, indicating that yield, not heavy metal content was of primary concern. Yet another study determined “that there was no heavy metal accumulation in the biosolids-amended soil even after 10 years” but also observed “nitrate-nitrogen contamination of the groundwater. (Surampalli)” These studies only look for the outcomes they are looking for and downplay other effects. They willfully forget that naturally, something comprised of mostly feces would be a good fertilizer and also willfully forget the toxic traits.

In San Francisco’s “organic” biosolids fertilizer triclosan, an antibiotic and endocrine disruptor was found along with polybrominated diphenyl ether (PBDE) (“Independent Scientific Testing Finds Toxic Contaminants in San Francisco’s Free ‘Organic Biosolids Compost’”). In his book, *What We Leave Behind*, Derrick Jensen, reminds us that unlike animals, plants do not have a digestive system and therefore nutrients are not immediately available to them. “The process of reducing the body of a plant or animal or animal’s droppings into mineral form can involve many creatures, from coyotes and vultures to earth-

worms and slugs to bacteria and fungi.” This became apparent to him when he noticed that after taking antibiotics, plants ceased to grow around his droppings. As more and more antibiotics are found in our bodies and nature, bacteria composition is bound to change, or even diminish. This could be a new kind of Dust Bowl.

Even more of a problem than the far-reaching environmental consequences of sludge is what it represents in our society. Sewage sludge or “biosolids” are a perfect example of how business interests have permeated almost every aspect of our lives. They do not do this on their own, they have a whole army of PR professionals and lobbyists working diligently to get what they want. They are intimately entwined in our government with a revolving door system. Even our locally made “organic” biosolids compost can be traced back to dubious sources. The bags of “compost” given away by the SF Utilities Commission was processed at a Synagro Central Valley Composting Facility (CVC). Synagro CVC is one of many subsidiaries of Synagro Technologies Inc., which is a holding of the Carlyle Group. Since the early 2000s, the Carlyle Group has been in and out of the media for its corruption, political connections, defense-contracting and human rights violations. Five percent ownership belongs to California Public Employees Retirement System, or CalPERS. In 2009, Monica Conyers, a Detroit City Council member and the wife of more famous Michigan democratic politician John Conyers, was convicted of conspiracy to commit bribery. “Conyers, 44, admitted accepting bribes in exchange for her vote to sway the City Council to approve Synagro Technologies Inc.’s \$1.2 billion contract in 2007” (DeMarche). Also in Michigan, James Rosendall, the vice president of the Michigan subsidiary of Synagro Technologies Inc., was also convicted of conspiring to commit bribery. The list goes on. This is the reason that despite overwhelming opposition to the use of sludge as fertilizer and a wealth of evidence on its toxicity, the practice persists. In a world where money talks, sewage sludge will always exist no matter the consequences.


SOLUTION

The first step in dealing with sewage sludge would be to stop polluting our biological waste. This would mean separating industrial waste from municipal sewage, which would quickly reduce the pollution of our water and land. Minimal changes to infrastructure would be needed to implement this solution. Industry would simply be cut off from the municipal sewage system and be forced to deal with their own waste, as they should. The system as it is, acts as a huge tax break to industry. This would put the financial burden back on them and not the citizens’ tax base. There is also the added benefit that chemicals could more easily be recycled within industries. As this transition occurs, existing sludge treatment facilities could eventually be converted into chemical recycling plants. While industrial waste is still being phased out of the system, higher standards of toxin screening need to be upheld. A truly sustainable system has no waste.

Once industrial waste is phased out of the sewage system completely and adequate chemical recycling plants exist, we can begin to shift towards more localized waste management. This could begin immediately in areas with adequate land availability, while in more urban areas, services could be developed to service composting toilets or other non-flush alternative toilets.

“A truly sustainable system has no waste.”

In addition to changing the way we deal with our biological waste, we need to begin to manage our wastewater in a way that maximizes the return of fresh water to the ground. Fresh water, which we rely on for survival is rapidly diminishing as a result of human induced climate change. We can stop water from being directed to the ocean by implementing greywater systems and simply replacing concrete sidewalks and parking lots with permeable alternatives. Permeable sidewalks are just what they sound like, sidewalks that allow rain to seep through to the ground beneath. They usually take on the form of movable tiles, pavers or bricks. Greywater systems take all the used water from a household that does not come in contact with biological waste and filters it on site through a process that mimics natural water purification processes, the purified water can then be used again in the house or used to irrigate plants. These alternative systems should be subsidized by the government and at the very least laws should be changed to facilitate their implementation, i.e., changing building codes to require greywater, permeable sidewalks and composting toilets.

In our current political climate, solutions will not be easy to carry out. With government and industry holding hands in solidarity against everything that stands in the way of growth, sewage sludge and many other environmental atrocities will persist. That is precisely why we so desperately need to displace our current system. It is not enough to just pass a law that “ensures” screening for safe levels of toxins. This practice of mixing industrial waste, clean water, and valuable biological waste must stop. Like many other environmental issues, in order to achieve this we must first have a social and political revolution that changes the fundamental way our government, our country, our culture and our world function. Capitalism is not a viable option anymore and some would argue, it never was. A system that funnels financial resources to an extreme minority is unacceptable. A system that takes two of our most precious resources, fresh water and excrement, infuses them with toxins and makes a profit is unacceptable. 

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Urban Sustainability:

Constructing a Foundation For a Strong Future

Sonja Gajic

The following piece addresses the components of sustainability and how it plays a role in our modern world. Sustainability, the capacity to endure, is becoming more and more prevalent in our society as concerns over the worsening environmental conditions worldwide continue. While the environment faces major peril at the expense of human activity, our social systems also face major issues because the hierarchy of racial and class systems continues to leave millions of people without jobs—perpetuating inequities that already exist. This piece intends to make connections about the concept of sustainability and the economy, proposing an idea originally promoted by environmentalist Van Jones, that we can grow our economy by providing dignified, environmentally-friendly jobs to lower-class communities. These communities are often people of color as well, who have difficulty finding work and thus improving their social status. By embracing the need for more sustainable methods, we as a society have the capacity to bridge the gap between racial and class inequities by providing underprivileged communities with dignified careers and thus promoting social justice within our society.



The evolution of the field of urban planning is important for understanding the built environment and how it functions. With rising concerns about environmental degradation and debate over the extent to which humans impact the natural world, urban sustainability has become a focal point in the field of urban studies. Sustainability, the process of promoting endurance in respect to environmental, economic, and social choices, has become increasingly necessary to achieve within cities for a healthier future. Urban sustainability involves applying such values as urban planning, transport, access to jobs, community building, etc., to reduce consumption and protect the natural environment. Urban sustainability plays a pivotal role in not only strengthening community development but also fueling local economies. Sustainable practices achieve this by decreasing dependence for communities on the global economy to provide resources at the expense of the natural environment.

Douglas Farr's text *Sustainable Urbanism* analyzes a case study to highlight this theory. Farr examines the BedZED ecovillage in South London, which is fighting to reduce carbon emissions and unite the community through every outlet possible—food production, vehicle usage, water systems, etc. Farr also discusses Holiday Neighborhood Boulder in Colorado, a project that fuses sustainable urbanism with affordability, and High Point, Seattle, dedicated to improving areas of low-income housing. Another prime example of the fusing of community strength and local economy is the Evergreen Cooperatives in Cleveland, a collection of companies dedicated to bridging the gap between sustainability and social justice by providing access to dignified jobs to community members and independently maintaining control on local financial resources. Author and famous environmental activist Van Jones presents in his book *The Green Collar Economy* another important case study, where a low-income mother pioneered the movement for urban farming in her community by renovating her own backyard into an urban "micro-farm." Such examples effectively target the three main issues that sustainability pertains to—environment, economics, and equity. The practice of urban sustainability not only effectively combats environmental degradation but also promotes local economic and community growth by uniting individuals on universal problems and encouraging awareness of city endurance through sustainable methods

Historical Background

Awareness and collective consciousness of the impact human activity has upon the natural environment emerged only recently as a problematic issue. The concept of sustainability arose after a series of environmental disasters across the globe—radioactive explosion in Chernobyl, Ukraine, toxic chemical dumps like Love Canal, the ever growing hole in the Antarctic ozone layer—that compelled many nations to question the consequences of human activity on the environment. These unintended shifts in the natural environment elicited concern that nature is fragile and maintains a threshold that, if crossed, could cause severe damage to human life. The Sustainability Report explains the history of the sustainability movement. A partnership with the institute for Research and Innovation in Sustainability, The Sustainability Report is Canada's first program dedicated to assessing sustainable progress on a long-term scale. The report argues that sustainability, as it is understood today, "emerged as a series of meetings and reports during the 1970's and

1980's," and the "UN Stockholm Conference on the Human Environment marked the first great international meeting on how human activities were harming the environment" (The Sustainability Report, 2000). This meeting marked the beginning of sustainability as a controversial concept that questioned the impact of human behavior upon the natural environment.

In 1987, The Brundtland Commission, sponsored by the United Nations, "released Our Common Future, a report that captured widespread concerns about the environment and poverty in many parts of the world" (World Commission on Environment and Development, 1987). This report was significant because it initially addressed concerning links between environmental degradation and the continuance of poverty on a global scale. The

"Communities are the backbone for individual prosperity as they support the needs that individuals"

report acknowledged that economic progression is unavoidable, but it must be altered to fit the boundaries of the planet's ecological constraints. The report therefore recognized "an increasing number of threats to the planet itself" (World Commission on Environment and Development, 1987), including increasing carbon dioxide levels that could lead to drastic natural disasters, like ocean acidification and wildfires. Sustainable development was also explained in the report, defined as further development that achieves present needs without endangering the capacity for future generations to do the same. Focus on sustainability reached its current peak in 1992 with the United Nations Conference on Environment and Development, where the officials of nearly 180 governments met with the Earth Summit to discuss this global problem. This meeting was based largely on sustainable goals established in 1987, and "produced two international agreements, two statements of principles and a major action agenda on worldwide and sustainable development" (The Sustainability Report, 2000). After new policies were established, the movement towards a more sustainable future became popularized, and today both individuals, communities and entire nations are working to produce fairer living standards and policies that encourage people to live in consideration of the environment and promote preservation of it for future generations, especially within urban areas.

FROM LOCAL TO GLOBAL

Achieving and maintaining sustainability in urban environments is crucial to the survival of planet earth. To continue at the pace that we are now—exploiting the natural world—leaves human beings without capacity to endure because all necessary resources will be exhausted. In order to reverse this process societies must completely transform the way they function, especially within the built environment. To do so, as Hallsmith argues, it is crucial to start at the community level—examining the ways in which different communities behave, acknowledging unsustainable practices, and beginning the process of change locally. Community redevelopment is crucial because

throughout time, “we have created community systems to meet our needs as human beings. Our cumulative needs are the drivers of unsustainable activities that are moving us at an accelerating rate towards global destruction” (Hallsmith, 7). Community systems are necessary as “we depend on communities to meet our needs that we cannot meet as individuals” (Hallsmith, 7). Communities are the backbone for individual prosperity as they support the needs that individuals “cannot meet” on their own. Thus, creating healthy and strong communities is vital to human existence, but such communities must also promote environmental sustainability, not degradation. Many various case studies taken from across the world prove that community redevelopment through sustainable efforts is effective in restructuring social, economic, and environmental ramifications to improve individuals’ lives while minimizing impacts on the natural world.

One fundamental example of sustainable community development is Beddington Zero Energy Development, or BedZED. Within the deep south of London lies an ecovillage dedicated to maintaining a status of zero carbon emissions with an entirely sustainable lifestyle in its community. According to BioRegional, a charity group committed to promoting practical sustainable solutions, BedZED “is the United Kingdom’s largest mixed-use sustainable community” (BioRegional, 2011). BedZED was initially built on the site of a sewage works system by a development team interested in capitalizing on its low prices to create this highly experimental village. Farr explains that true sustainability is dependent on lifestyle factors as well as efficient infrastructure, and “BedZED incorporates several elements designed to foster a community with a sustainable conscience, reinforcing green buildings with green behavior” (Farr, 214). BedZED meets various key sustainable urban thresholds, like car sharing and minimizing commute. Units from which one can both live and work have entirely eliminated the work commute for many of its residents. For those still needing access to a car, BedZED provides access to electric cars powered by solar panels through a car-share program. The village also maintains sustainability through efficient building mechanisms. The structures “are designed to combine a highly efficient building envelope with usage of 100 percent renewable energy” (Farr, 214), and are made from recycled resources. Inside, efficient “fixtures and appliances have also reduced usage of potable water and electricity” (Farr, 214), allowing energy consumption to drop drastically. Home efficiency is “augmented by green infrastructure that provides renewable energy” (Farr, 215), like the usage of a biomass system to supply heat and power. Overall, these energy effective strategies “have produced savings of 30 percent in water usage, 90 percent in space heating, and 25 percent in electricity in general” (Farr, 217), proving that energy-saving techniques are highly efficient. Social sustainability also plays an important role in BedZED development. The issue is addressed through social housing—affordable units that are rented to citizens. The success of BedZED is “due largely to the tight-knit community that has formed there through shared facilities and an interest in sustainability” (Farr, 217). Neighbors support each other in their sustainable endeavors while creating an inviting and welcoming place to live. BioRegional interviews



Above: BedZED units combined with work spaces to minimize need for commute.

several BedZED residents, who comment by saying that they “wake up every morning thinking we are on holiday” (BioRegional, 2011). The efforts to produce an effective sustainable community in BedZED have, in fact, proven to be successful because the citizens collectively work together to promote community equity and enduring life choices. BedZED thus symbolizes the capacity for communities to change for the better, creating strong local bonds while valuing sustainability in every aspect of their lives.

The Holiday Neighborhood Project in Boulder, Colorado, United States is another example of a community working to combat both environmental destruction and social inequities. Holiday Neighborhood’s online source illustrates the ramifications of the project, stating the project could only be successful if it “provides affordable housing, economic opportunities for residents, community strength, and is multi-generational” (David Wann, Sustainable Futures Society). Fusing sustainable urbanism with affordability, the city was thoughtfully planned using an EPA grant won by the Sustainable Futures Society—dedicated to greening Holiday Neighborhood. Sustainable technologies were applied to the development of the site to “prevent Holiday from adding to the city’s traffic congestion, and its retail spaces would provide job opportunities to residents” (Farr, 222). To increase affordability, houses were built smaller than previously planned, where the city “approved a zoning change to allow twenty units per acre to be built in Holiday, up from the site’s original ten acres” (Farr, 222). The housing increase dropped prices and allowed lower-income residents to achieve better housing. Mass transit became the primary source for commutes, eliminating car expenses for most and making it feasible for everyone to reach their jobs without high gas prices. The city also utilizes solar panels to take advantage of Colorado’s yearlong sunny climate to provide the residents with energy-efficient homes, who can expect “to pay 50 percent less in utility bills, and use 40 percent less water” (Farr, 224). The water salvation system is the storm water management plan, where retention areas cleanse the water before allowing it to retreat back into the ground. Ultimately, the project “is a world-class model of a sustainable, affordable neighborhood,” a “resource-saver” that supplies “favorite foods that don’t have to be shipped 1500 miles to residents’ tables” (Wann, Sustainable Futures Society). Most Americans consume massive amounts of energy in their daily activities, but Holiday Neighborhood residents are expected to consume a full 40% less annually with full access to these sustainable alternatives. Overall, the city’s plans effectively target individuals who earn all levels of income in order to assure equality to all who are interested in moving to Holiday Neighborhood, and provide fair access to sustainable activities to all of its residents. Holiday Neighborhood was “able to create a truly affordable sustainable community” (Farr, 224) that requires enduring living standards and encourages social equity within the city.

HIGH POINT, SEATTLE

Another prominent example of sustainability working to transform a city is in High Point, Seattle, Washington, United States. Project managers in High Point work to transform an area previously afflicted by low-income housing into a neighborhood that exceeds Seattle’s goals for reshaping public housing demands. According to the High Point Neighborhood website, the community “was designed to be a model of green development and sustainable living,”



High Point, Seattle WA

and the projects' efforts have demonstrated "that Green Living is Good Living" (High Point Neighborhood, 2010). The city is thus another role-model example for sustainable urbanism strengthening communities and promoting equal living standards. High Point will contain 1,600 units of housing within a twenty-five city-block area to accommodate 4,000 Seattle residents. Two major bus routes will circle within the area to minimize automobile congestion as well as a car-share program for those who require a car to reach their destination. Conveniently located only a short drive from downtown Seattle means access to various types of jobs is possible for High Point residents. Within the project area services like a clinic, public library and neighborhood center also provide opportunities for employment as well as important services to the community. The greatest strength of the project is the "priority given to integrating low-income housing into a mixture of housing types, incomes, and designs" (Farr, 237). The site also is "designed to encourage a strong sense of community" (High Point Neighborhood, 2010), which establishes strong backbone that will ensure the success of the project overall. The city design features—like narrow streets with inviting porches to encourage socialization among neighbors—promote safety and well-being by fostering interactions between residents. These factors fused together create an inviting environment for individuals of all social classes to feel welcome in High Point. Promoting class integration in one location slowly erodes class boundaries and promotes social equity by fostering solidarity among its wide range of residents. The diversity of High Point allows the community to achieve this

goal, serving as a role model for future city development in other locations. High Point supplies important community spaces with a variety of activities along with new homes to neglected city residents while improving sustainable standards and augmenting neighborhood unity.

One of the most important components of establishing sustainable communities is their capacity to improve the local economy by promoting green jobs that are safe for the environment. Strong local economies are vital to sustainable urbanism because they encourage community independence while minimizing energy costs by eliminating the need to bring outside resources from far-away facilities. Although the previous case studies reflect important links between strong community ties and sustainable methods of living, Author Van Jones more adamantly proposes the idea of a “green-collar economy,” whereby subordinate communities are provided with jobs that service the sustainable sector of the economy and encourage it to grow while keeping environmental costs at a minimum. Jones supports his proposition with a case study examining the efforts of mother LaDonna Redmond to improve her neighborhood in Chicago. Redmond, after making great effort to find healthy food, realized it was virtually impossible in her poor neighborhood. She then decided to renovate her backyard into an “urban micro-farm” to provide her with fresh, local and organic produce she could not find anywhere else. In doing so, Redmond attracted so much attention from residents that she spurred a movement towards local farming in her community—bringing together individuals united on a common cause that affected them all. Jones argues that “LaDonna’s projects go beyond mere gardening because the intent is to look at the comprehensive approach to the issue of developing local economies—hiring locally and selling locally” (Jones, 477). By cultivating previously unused land, Redmond’s Chicago town estimates a potential total of forty-two thousand new full-time jobs. In doing so, Chicago neighborhoods not only provide sustainably-friendly jobs to their people but also encourage economic independence by providing access to local resources. Jones proposes that the most efficient method by which products and services are manufactured and cultivated is to target underserved communities—like Redmond’s Chicago neighborhood—and provide access to sustainable jobs in a similar manner. The local economy would then not only grow from new jobs without polluting the environment but also would work to reverse racial and social disparities that plague many inner city communities.

CLEVELAND TO OAKLAND

The Cleveland Evergreen Cooperatives is another optimal example where coupling community strength with local job and financial growth is very successful. The concept of cooperatives implies that the company’s employees all own a portion of the company, and therefore are entitled to make democratic decisions about the company as they see fit. Their network of these cooperative businesses has fueled the movement for social change by promoting stronger ties to equity and community involvement. Author Penn Loh for the CoLab Radio Blog published an article reviewing the strengths of the cooperatives, questioning how they were initiated. He explains that the web of cooperatives started with a “unique convergence of leadership in Cleveland about five years ago, centered by the Cleveland Foundation” (Loh, 2010), a group focused on economic regrowth and revitalization in Cleveland


and the surrounding area. The neighborhoods in Cleveland included groups such as the Case Western Reserve and Cleveland Clinic—both local organizations with public health services—that emerged as the best institutions in their sector, which “got institutions who had previously been competing with each other to start sharing their master plans and to start considering their role in the future of the distressed neighborhoods that surrounded them” (Loh, 2010). This conscious understanding allowed Cleveland groups to begin a process of working together to encompass a large spectrum of community growth, instead of segregation. The organization grew, and with financial support from the Mayor of Cleveland was able to gain momentum and emerge as a solid foundation for other local companies to join. Medrick Addison, one of the founding worker-owners of the cooperative, explains the process for newcomers. He says he asserts that the “cooperative model is about worker ownership,” more than just “local hiring and better wages” (Loh, 2010). After workers has surpassed their initial six-month period, they are invited to become worker-owners, whereby they “receive full health insurance coverage, a vote in the governance of the business, and a share of the profits” (Loh, 2010). The Cleveland Evergreen Cooperatives have thus effectively began to erode social inequities by inviting all community members to join in the system, where they have access to dignified jobs and equality in their workmanship as owners of the company.

The success of promoting local economic growth through community leadership and sustainable practices can also be seen through the efforts of Oakland citizens. Jones presents a case study that analyzes the impact of People’s Grocer on West Oakland, an area plagued with many problems. Oakland is “a place facing multiple challenges, where residents’ economic as well as mental, emotional, and physical health issues compound one another” (482). Devastating issues like police brutality, environmental toxins, and disease epidemics have compounded to create a brutal struggle for many Oakland families and individuals. Jones displays environmental activist’s Brahm Ahmadi’s efforts to redevelop Oakland. Ahmadi, realizing that “food is our medium for achieving broader outcomes in community development and addressing disparities in opportunities and quality of life,” (Jones, 483) cultivated the first urban garden in Oakland. Named the People’s Grocery, the gardens have grown to multiple locations throughout Oakland since its inception. Ahmadi, now the Executive Director of People’s Grocery, argues that efforts to grow local, healthy food and employ community members in doing so is the most effective way to reboot the community because food is a fundamental human necessity. Every human must eat, and being able to work for the local economy by producing one’s own food is a source of empowerment unlike any other. This empowerment thus encourages community members to join together in working for a common cause while maintaining their local economy and minimizing impacts on the environment. Ahmadi is now seeing “a revolution in terms of environmental stewardship and reducing the carbon footprint in the food system,” as well as “dignified job and wealth creation rooted in social justice and environmental sustainability” (Jones, 487). Urban sustainability proves to be an effective method to simultaneously fueling local economies, minimizing dependence on global markets that pollute the environment, and promoting social equity that offers employment to local residents—thereby empowering them both as individuals and members of a larger community.

“Being able to work for the local economy by producing one’s own food is a source of empowerment unlike any other.”



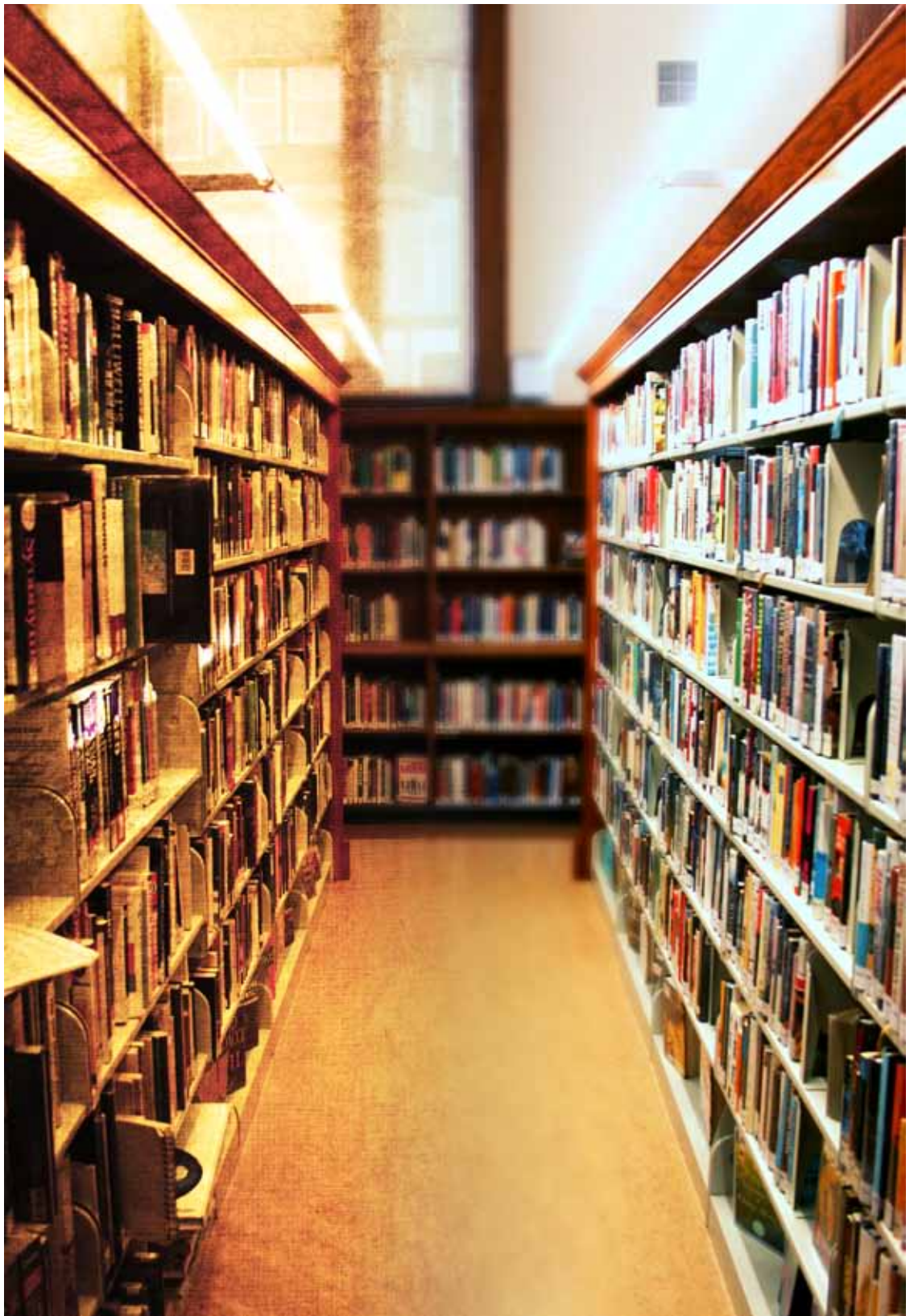
COMMUNITIES BUILT TO LAST

In the new era of sustainable urbanism radically different cities are emerging across the world and serve as indicators that change can, in fact, happen. Cities are being renovated starting at the community level, where strong bonds between individuals foster solidarity and strength that maintain the efficiency of the city overall. New developments in sustainable methods create new jobs for residents and boost local economies, helping to minimize dependence upon the larger economy and destructive environmental habits that are of consequence to it. Ultimately, all important changes will occur within cities. Author Richard Register asserts the need to build new ecocities, arguing that “building the ecocity will create a new cultural and economic life in which we can tackle the problems of healthy evolution rather than fighting a rearguard action aimed at repairing the damage” (Register, 5). The capacity to have a sustainable future—with communities within cities being central to social, economic and environmental progress—is entirely possible by revolutionizing the way cities function today. In doing so, Register argues that the new “ecocities” will not only be favorable to the natural environment but also promote the growth of local economies that empower residents and create a culture dedicated to the importance of community solidarity. Many cities across the world have already made massive leaps towards sustainable futures by entirely redeveloping their communities to meet environmentally-friendly standards and in doing so have fostered the growth of community leadership and strength by uniting people on a common cause. Many, too, originally began as underserved, poor areas that had been neglected for many years and are now revamped to serve as role-model cities for many others. These examples—BedZED, Holiday Neighborhood, High Point, Cleveland, West Oakland—prove that it is possible for many others to take initiative and do the same. The growth of local economies proves to be possible as well as vital to supplementing the needs of community residents without consuming energy to achieve outside resources. Sustainable urbanism is not only important but also is urgently needed as we continue to over-use resources and degrade the planet through our lifestyles. Individual efforts are important but they are not enough. Entire communities must make the dedication to change their inner system and foster positive change within their larger cities in order to ensure a safer, healthier, and more just future for both humans and the planet. 

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Conserving the Future, Preserving the Past

A San Francisco Public Library case study review and systems approach to heritage building eco-renovations

Andey Nunes

Green building is a popular topic in the realm of urban studies and planning, with the U.S. Green Building Council and their LEED certification, to whole neighborhoods built to promote green sustainable lifestyles. One critique that is sometimes made about the green building fever is, wouldn't it be greener to not build a new building at all? This question ties in to historical preservation, a controversial topic on itself. The following piece will explore how historical preservation can be done while still giving the benefits of building a new green building through the process of eco-renovations. The author will look at how The San Francisco Public Library applied this idea to their Presidio and Park branches.

“As preservation teaches us all to better value the past, it is my hope and prayer that it also helps us to fully awaken to our responsibilities to the future.”

~Carl Elefante

According to the California Environmental Quality Act (CEQA), all buildings constructed over 50 years ago and possessing architectural or historical significance may be considered potential historic resources. As communities, we connect to the past through heritage buildings. Increasingly, historic preservation plays an important role in sustainable community development by allowing the community to identify its values through the places that embody those values (Jonker 2011). In San Francisco there are presently over 3300 parcels determined eligible for listing in the California register and many more that would warrant consideration under CEQA when undergoing renovation. It has been said that the greenest building is the one already built (Elefante 2007). When combining the character of San Francisco's built environment with our nationally acclaimed green building ordinance, eco-renovation represents significant opportunity for continuing use of historic buildings and heritage assets while reducing environmental impact and protecting their heritage value (Jonker 2011, SF Planning 2011). I served as the sustainable building advisor for the construction team and wrote a case study on construction processes utilized during the renovation of the two oldest existing San Francisco Public Libraries, the Presidio and Park Branch. This article reviews the case study and offers an exploration in the pursuit of preserving heritage buildings that not only serve and represent the community but also meet the demands of our resource-constrained future.

The case study, *Conserving the Future While Preserving the Past*, investigates the construction process at Park & Presidio Branch Library renovations. While offering a unique opportunity to examine the application of LEED® for Commercial Interiors™ in the context of historic renovation, the case study compares two projects with same specifications, schedule and design and construction teams but with different LEED certification outcomes. Though many library renovations in San Francisco's Branch Library Improvement Program were designed to LEED standards, these were the first library projects in San Francisco to complete U.S. Green Building Council's (USGBC) third party reviewing process and attain certification, Park Branch achieving LEED Gold and Presidio Branch LEED Silver certification. My work on the project involved guiding the construction team, which had no prior LEED project experience, to achieve the environmental goals of the projects by focusing on mentoring and performance coaching to develop cross-team green building leadership. The case study covers methods and concepts of LEED project delivery, lessons learned, and best practices to guide contractors on their first LEED projects. It highlights a systems approach focused on the interactions between construction processes, materials, and LEED credits while emphasizing learning and language tools to nurture a shift in the conventional construction methods towards more sustainable practices.

INTRODUCTION

In San Francisco, Chapter 7 of the Environment Code requires all municipal projects to be built to green building standards according to U.S. Green Building Council's (USGBC) Leadership in Energy and Environmental Design (LEED) rating system. LEED is an independent, third-party verification process that uses specific rating systems based on the type of building or project—such as new construction, commercial interior renovation, or operation & maintenance for existing buildings. Projects earn credits through the design and construction processes in categories such as sustainable sites, environmental quality, materials & resources, water and energy efficiency, and innovation. Projects must earn a minimum number of specified credits to qualify for LEED certification and the award is based on the number of credits achieved with levels ranking from basic certification to silver, gold, and ultimately platinum. Professionals trained in LEED design and construction processes with experience in the LEED certification process can apply to become a designated accredited professional (LEED AP). For municipal projects in San Francisco, contractors who bid on projects meeting these standards must either have a LEED AP on staff to direct the construction process and document the credits for third party verification, or they must hire consultants to help with that process. In March of 2010, I began working with Roebuck Construction to guide them through what would be their first LEED projects, the Park Branch and Presidio Branch San Francisco Public Library renovations. My case study was written the summer after the libraries opened in 2011 and highlights the successes and challenges of these historic renovation projects while offering insights gained through the process.



CASE STUDY OVERVIEW

In November 2000 San Francisco voters passed a bond measure which enabled the partnership between the San Francisco Public Library (SFPL) and Department of Public Works (DPW) to improve San Francisco's branch library system. By July 2011, the Branch Library Improvement Program had completed 20 renovation projects. The Park Branch Library, a Neo-classical building, was built in 1909 and is 8,825 square feet. Park Branch is located at 1833 Page Street and serves the following neighborhoods: Upper and Lower Haight, Cole Valley, North of Panhandle, and part of Parnassus Park. Park Branch library reopened February 26, 2011 and earned LEED Gold certification. The Presidio Branch Library, a Carnegie building in Italian Renaissance style, was built in 1921 and is 10,205 square feet. Presidio Branch is located at 3150 Sacramento Street and serves all or part of the following neighborhoods: Pacific Heights, Presidio Heights, and Laurel Heights. Presidio Branch reopened March 26, 2011 and earned LEED Silver certification.



San Francisco Park & Presidio Branch
Public Libraries, Circa 1916.

CONCEPTS & METHODS OF LEED PROJECT DELIVERY

The case study begins by looking at the concepts and methods of LEED project delivery, by focusing first on how the project was managed. As the LEED AP consultant I worked with Roebuck in a mentoring capacity to coach their project management team in adopting LEED construction methods and documentation. We established systems for documenting the LEED credit compliance and training subcontractors. Day to day documentation was del-

egated to a Roebuck assistant project manager allowing the LEED AP services to focus on training, coaching & mentoring, auditing documentation, and uploading LEED Online templates. This approach resulted in substantial consultant fee savings for the general contractor while providing on-the-job LEED project leadership training. Additionally, these projects were the first municipal projects to employ this approach in the construction phase of a project.

Before any subcontractor's scope of work started, we held LEED orientation trainings for the supervisors of subcontractor crews. The orientations were developed in a way that instructed the general contractor project management team on how to train their subcontractors. Pre-task subcontractor orientations provided crew supervisors with training in LEED construction methods. Immediately following the orientation, supervisors were instructed to gather their crews into huddles to deliver the orientation training they had just received. This way, the message of how LEED construction processes were different from conventional practices came from within the subcontractor teams instead of from the consultant. This method of training the trainers worked to develop green building leadership at the subcontractor level from day one and continued throughout the project.

Sustainable design philosopher Jason McLennan said, "if we want to change a result, we must first change the process that led to the result." (McLennan 2004, p. 86). As the project's sustainable building advisor I understood that in order to implement McLennan's idea and change the conventional processes, we had to start by changing the thinking that led to the process. To change the thinking imbedded in conventional construction methods and nurture the adoption of more sustainable practices, language tools were developed and used consistently throughout the LEED credit compliance plans, and training & coaching sessions. Examples of language tools included referring to waste management as materials reclamation and referring to indoor air quality in terms of occupant and worker safety. If construction debris is not referred to as waste but rather as materials to be sorted and prepared for another industrial input (recycling), then wasteful habits transform into mindful material handling processes. If indoor air quality is referred to as occupant and worker safety, then IAQ measures can be perceived as a human health issue in addition to an environmental issue.

The plan for construction waste management was called the Construction Materials Recovery Plan and all construction and demolition debris handling activity was referred to as "materials recovery". The physical aspects of the materials recovery process is discussed in detail in the LEED Construction Process section that follows this discussion. In order to meet the goal of diverting 95% of the waste from landfill, all materials were broken down and sorted onsite so that the contents could be reused or remade. Crew members were responsive to generating plastic, metal, and "mixed materials" as byproducts of the project tasks because they understood such materials were associated with a higher diversion credit and potentially higher market value. This shift translated into changes in the demolition schedule and task descriptions towards deconstruction practices. Laborers assessed the materials to be removed and sorted, and adapted practices that facilitated materials sorting in tandem with removal from the building structure. All crew members were empowered to coach others in sorting practices and all were encouraged to pose questions to the procedures and make field adjustments to enhance the



Park Branch Public Library. San Francisco, CA. 2012.



Picture 2: Presidio Branch Public Library. San Francisco, CA. 2012.

sorting and recovery process. An example of this shift occurred at the Presidio Branch. Crews trained in the materials recovery process disassembled sections of walls designated for demolition and sorted the wall systems into plaster/ gypsum, wood, and metal which were all taken to recology for recycling.

The Indoor Air Quality Plan, or IAQ plan, for LEED involves adopting specific guidelines and practices published by the Sheet Metal & Air Conditioning Contractors' National Association (SMACNA). In the IAQ plan the SMACNA guidelines and practices were called IAQ protective measures and were incorporated into job site housekeeping and safety practices, as well as materials specifications. Communication of IAQ inspection tasks linked the specific IAQ protective measures to not only achieving the intent of the LEED credits and the goals of the project, but also to the benefits of worker and occupant safety. Workers were encouraged to engage in open dialogue about their concerns of the "trade-offs" of transitioning away from conventional practices and materials and adopting the sustainable methods. Through the expression of opinions and preference differences, crew members developed their own motivations for adopting sustainable methods based upon their individual set of values, existing working relations, and company resources. The dialogue facilitated cross-team clarification of job site performance expectations while crew members decided individually and as teams how to best to adapt their practices to meet the project goals. By emphasizing the learning processes that would help subcontractors become more competitive for future green building jobs and meeting new CalGREEN standards, language was used to develop intrinsic motivation and crew member accountability in adopting sustainable building practices.

LEED CONSTRUCTION PROCESSES

Materials & Resource credits (MR credits)

The construction project team achieved four out of six points attempted in the Materials and Resources category for use of salvaged materials (for two points) and construction waste management (also for two points with an additional point awarded under Innovation for exemplary performance).

By implementing a comprehensive Construction Materials Recovery Plan that minimized the amount of materials sent to landfills from the construction and demolition (C&D) processes, both projects earned three points for achieving the landfill diversion rates shown in Table 1.

Facility	Overall Project Diversion Rate	C & D Diversion	Recycle & Compost	Additional GHG reduction over 65% diversion ordinance	Additional % GHG reduction for CMR
Park	97.97	74.65 tons	1.56 tons	18 metric ton CO2 equivalent	51%
Presidio	98.89	168.34 tons	2.12 tons	31 metric ton Co2 equivalent	70%

Table 1: SFPL Park and Presidio Branch Construction Materials Recovery Data

*GHG emissions calculated using EPA's WARM online calculator based on the project performance in material diversion and use of thwe three-bin system against the City of San Francisco Construction and Demolition ordinance requirement of minimum 65% diversion and no construction site use of the three bin system as the baseline case.

The team coordinated with Recology to plan deconstruction and onsite sorting to maximize the diversion rate. In accordance with the San Francisco Construction & Demolition (C&D) Debris Recovery Program Ordinance (No. 27-06), all construction materials removed from the projects were handled and delivered to facilities registered with the San Francisco Department of Environment. All non-construction materials were handled using the three-bin system for commercial accounts. By successfully composting and maximizing recycling the projects contributed additional greenhouse gas (GHG) savings of 51% & 70% above the GHG reduction from simply complying with the 65% diversion mandated in C&D Ordinance 27-06. This finding was unexpected and is an impressive figure considering that San Francisco has both a zero-waste goal and a climate change plan to reduce green house gas (GHG) emissions. This analysis shows great promise for municipal construction projects to further both city goals by focusing on achieving greater diversion rates through the use of Construction Materials Recovery Plans that incorporate deconstruction methods, onsite materials sorting, and use the three-bin system for non-construction materials.

Facility	Construction % FSC wood	After accounting for furniture % FSC wood
Park	83%	30%
Persidio	67%	12%

Table 2: SFPL Park and Presidio Branch Use of FSC certified wood as percent of total new wood value.

Both projects attempted but were unable achieve points for MR credits 6 and 7. MR credit 6 requires the project to use rapidly renewable construction and furnishing materials for a minimum of 5% of the total value (\$) of all materials and products used in the project (USGBC 2007). Rapidly renewable materials are generally products made from plants that are typically harvested within a 10-year or shorter cycle (for example bamboo, linoleum, straw/wheatboard, wool, or cork). The projects came close to meeting the goal based on total cost of products containing rapidly renewable content. However only the percentage of cost correlated with the content count towards the credit. For example, a product specified containing only 50% renewable content, contributes only 50% of the cost value to earning the credit. The products used did not have a high enough renewable content to earn the credit. MR credit 7 encourages the use of environmentally responsible forest management by requiring minimum 50% new wood-based products to be composed of a wood materials certified in accordance with the Forest Stewardship Council's (FSC) Principles and Criteria (USGBC 2007). The construction team had commendable performance in achieving use of greater than 50% certified wood, however LEED-CI mandates inclusion of furniture in the calculation. For other LEED rating systems furniture is not included in the calculation for the FSC wood credit. This credit is calculated based on wood costs and furniture wood costs were more than double construction wood costs for both projects. Table 2 shows the resulting percentage FSC wood value. After investigation of furniture purchases it was determined that purchases were specified to be minimum 50% FSC wood. However, the



Park Branch Interior. 1916.



Park Branch Interior. 2012.

purchasing team did not track the chain-of-custody documentation from the vendors. This protocol documentation gap was not discovered in previous projects because these projects were the first libraries to be reviewed by the USGBC's third party verification process. Both MR credits 6 and 7 proved to be valuable lessons learned in these projects.

ENVIRONMENTAL QUALITY CREDITS (EQ CREDITS)

For the Environmental Quality credits the projects used a holistic systems-approach that focused on interactions between materials and construction processes on the air quality while emphasizing coaching and training to achieve compliance. The construction team achieved all seven attempted EQ credits and was one point each for Construction IAQ management during construction and before occupancy, and one point each for use of low-emitting materials for five different categories of building materials and products.

Construction IAQ Management during construction and before occupancy is intended to prevent indoor air quality problems resulting from the construction/renovation process in order to help sustain the comfort and well-being of construction workers and building occupants (USGBC 2007). A set of comprehensive IAQ Management Plans were drafted for the construction team and tailored specific to the job site conditions and specifications. The SMACNA guidelines were integrated into job site housekeeping and safety and documented using photos and a weekly inspection log.

Municipal projects require the implementation of specific indoor environmental quality procedures to take place after a project finished and cleaned prior to occupancy. There are two options for meeting the before occupancy IAQ requirement, by either performing a building flush-out or performing prescribed air testing.

A building flush-out is a process that uses mechanical systems to deliver a high volume over an extended time period to rid the building of potentially harmful chemicals that off-gas from building materials. However, like many historic buildings, these libraries are naturally ventilated, which means they do not have mechanical ventilation systems. This feature contributes to significant energy savings by accomplishing outdoor air exchange through operable windows and the building design itself.

IAQ testing involves taking samples of the air and testing for specific chemicals. When a flush-out is performed, there is nothing to determine levels of potentially harmful chemicals present in the air once the procedure is complete and the move-in begins. Air testing quantifies levels of formaldehyde, particulates, volatile organic compounds (VOCs), and carbon monoxide. The air testing strategy is employed less frequently because of the prevalence of mechanical ventilation and the risk of failing the air quality test in one or more of the parameters due to insufficient IAQ during construction procedures or use materials that produce gas.

After carefully weighing the advantages/disadvantages of both strategies, the project team decided to pursue the air testing strategy. The IAQ testing results are summarized in Appendix Table 3. These were the first library projects to perform IAQ testing, which resulted in substantial schedule, labor, and energy cost savings over the flush-out strategy. Success of this strategy hinged on strict compliance with SMACNA guidelines and use of

low-emitting materials.

The intention of the use of low-emitting materials (or low VOC) on the projects was to reduce the quantity of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants. The following products were required to be within the South Coast Air Quality Management District's (SCAQMD) standards: adhesives and sealants; paints and coatings; carpet and flooring systems; and systems furniture and seating for VOC limits. Composite wood and laminate adhesives were required to contain no added urea-formaldehyde, a known carcinogen. (USGBC 2007, NCI/NIH 2012).

Documentation of the use of low-emitting materials for IAQ compliance presented a few challenges to the team. Vendors and subcontractors were challenged at providing the proper documentation listing the VOC content of products. Often this information is included in product Materials Safety Data Sheets (MSDS), but when it is listed as percent by weight content calculations must be performed to convert it to grams per liter to compare with the SCAQMD standards. The projects were set up with an IAQ product check-point where the VOC content of any of the products listed above was verified before it was allowed to be brought onsite.

The composite wood credit specified restrictions for urea-formaldehyde content in addition to VOC content limits. However, vendor receipts for raw wood products such as plywood were inconsistently labeled. Even though formaldehyde was not listed as an ingredient in any of the adhesives used in the wood products, the MSDS sheets alone were insufficient to show compliance for this credit. The team had to contact and request a letter from the manufacturer of each product verifying that no urea-formaldehyde was in the formula of any of the adhesives in order to earn the LEED credits.

The last section of the case study looks at the outcomes and lessons learned to develop better practices. The new 2012 San Francisco municipal building code will require Gold certification standards for all municipal projects. Lessons learned and better practices presented in the case study can assist contractors with less LEED project experience and successfully meet the project's environmental goals.

OUTCOMES, LESSONS LEARNED AND BETTER PRACTICES

The greatest value-added outcome for the projects was building commissioning. The building commissioning process is a prerequisite for the Energy and Atmosphere credits for LEED certification and requires an independent engineer to perform functional testing of all energy using electrical and mechanical systems. This process is executed and reported directly to the owner and creates immediate accountability for system functionality between design and construction which provides the highest project return on investment (ROI) of any of the LEED credits. Appendix Table 4 provides examples of the major corrective issues resolved on these somewhat simple building energy and mechanical systems. Functional testing and training saved valuable time and resources for facilities by significantly reducing contractor callback after the buildings were in operation. With city operations budgets continuing to be constrained the ROI will only go up. It is recommended that enhanced commissioning be pursued whenever possible in municipal projects.

The most important lesson learned was with submittal and documentation tracking for vendors, contractors & other stakeholders. Before any construction activities began all contractors and vendors received a LEED documentation request notice alerting them to the LEED Goals and requirements for the projects. Most documentation issues were resolved in bi-weekly meetings and through coaching and training sessions.

Better practices for the LEED documentation process include:

- *Providing annotated examples of proper documentation specific to each material or contractor with the LEED documentation request letter and at contractor LEED orientation trainings*
- *Using a web-based project management tool such as Base Camp™ that all vendors, manufacturers, stakeholders, design & construction team and subcontractors can access and collaborate online to collect and manage supporting documentation. With this you can create a project dashboard that tracks credit performance and documentation compliance in one place.*
- *Adding a specification line that refers to Sustainable Design & Special LEED Environmental Requirements within sections for specific building components because often subcontractors do not receive a full set of specs.*

Better practices for training green building leaders and using language to shift conventional habits towards sustainable practices include:

- *Developing formal team operating agreements to clearly communicate roles, responsibilities and accountability for different tasks*
- *Training the trainers and developing leadership from the beginning of the project*
- *Having signage and training info available in non-English languages used on the job site*

Better practices for achieving Materials & Resources credits are listed below:

- *Composting, & materials recovery*
- *Developing closed loop systems approach to materials by avoid use of word “waste” or “debris” and refer to materials as resources being prepared for input to another industrial process*
- *Deconstructing building components and fixtures, separate onsite as-you-go*
- *Tracking 3-bin contents in a spreadsheet and coordinate with hauler for conversion calculations*
- *Sustainable materials*
- *Developing spreadsheet for furniture assemblies to track content relating to LEED credits*
- *Prior to beginning construction, using the materials tracking spreadsheet and vendor/subcontractor bids to develop a baseline for compliance with LEED materials credits. Highlight any gaps and optimize purchases or unattempted credits deemed to be constrained*


Lastly for MR credits, in order to align municipal construction and renovation projects with the city's long term environmental goals such as GHG emissions & climate change, toxics reductions, zero waste, and environmentally preferred purchasing it is recommended that municipal building improvement programs develop a Materials Management & Purchasing Master Plan. Master purchase plans for building improvement programs could be used to leverage manufacturers and vendors in niche market products to develop the supply chain resources needed to help project teams and stakeholders making purchases that affect LEED credits to meet the overall environmental goals.

Better practices for Indoor Environmental Quality credits emphasize the interactions between materials, sustainable building practices, and testing results and include the following recommendations:

- *Begin before construction and cooperatively determine SMACNA guidelines to be followed for the project. Incorporate them into jobsite safety & housekeeping standards. Inspect IAQ measures on a weekly basis and keep a photo journal and a inspection log.*
- *Audit all EQ credits on a monthly basis including supporting documentation for low emitting materials.*
- *If IAQ testing is chosen as the compliance path, it is important to nclude a detailed copy of LEED testing requirements and specify documentation requirements for credit compliance when seeking an independent testing agent.*

CONCLUSIONS

The goal of the case study was to provide insights to future project teams by capturing the lessons learned in guiding a construction team through their first LEED certification project on a municipal historic building renovation. The opportunity to train inexperienced contractors in LEED construction processes is important as a social and economic justice issue especially for locally owned and women/minority owned smaller contractors who have fewer resources to access LEED AP services or pay for staff to attend special training sessions. This method of coaching and mentoring on the job has the potential to develop contractor green building skills while making them less dependent on outside consultants.

The case study demonstrates that what is needed is a holistic systems approach to LEED project delivery that begins with shifting language and perspectives and focuses on mentoring, training, and performance coaching to develop cross-team green building leadership. The LEED construction processes implemented and suggested in this case study highlight the interactions between LEED credits and offers a kind of systems approach that emphasizes the interrelated task performance by crew members and the role of vendors, manufacturers, stakeholders, and project team leaders. The better practices are specific to this project experience in San Francisco, but reflect a holistic systems-approach that integrates municipal environmental policy and stakeholder collaboration with project implementation in the pursuit of preserving heritage buildings that not only serve and represent the community, but also meet the demands of our resource constrained future. 



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APPENDIX

What is USGBC and LEED?

The U.S. Green Building Council® is committed to a prosperous and sustainable future for our nation through cost-efficient and energy-saving green buildings. With a community comprising 78 local affiliates, more than 20,000 member companies and organizations, and more than 140,000 LEED® Professionals™, USGBC® is the driving force of an industry that is projected to contribute \$554 billion to the U.S. gross domestic product from 2009-2013. USGBC leads an unlikely diverse constituency of builders and environmentalists, corporations and nonprofit organizations, elected officials and concerned citizens, and teachers and students. USGBC is the developer of the LEED green building certification program and the convener of the Greenbuild® International Conference & Expo. The LEED® green building certification program is the nationally accepted benchmark for the design, construction, and operation of green buildings.

Author Bios

VICTOR OBECK

Victor Obeck was born in Los Angeles after his parents moved from Manhattan island to Manhattan Beach. After dropping out of film school, Victor worked in a variety of jobs ranging from Dolphin Videographer to Location Scout for Donald Trump. From years of traversing L.A. and playing Sim City, Victor discovered a passion for good urban planning. In 2008, he sold his car and moved to San Francisco to manage an affordable housing program. He lives with his wife and is currently completing an Urban Studies major at San Francisco State University.

ALICIA PISANI

Originally coming from an Maltese-American immigrant family that settled in Detroit, Michigan in the 1960s; I now find myself 2,400 miles away in San Francisco studying Urban Planning. After seeing how urbanity in my home city has deteriorated over the years, I feel it is extremely important for upcoming generations to understand why cities are so important and what they can do to change the path of deteriorating cities. Time spent in art and design school, coupled with years spent in international environmental policy courses has led me to my true calling in planning with a focus on environmental justice and urban design. Aside of my studies, I enjoy my hanging out with my dogs, the beach, traveling, snow and riding my motorcycle up and down CA 1.

RAMON HERNANDEZ

I am a senior, Urban Studies and Planning major, at San Francisco State University. I am passionate about understanding the context of our urban environments. Urban Studies and Planning has allowed me to analyze the concerns of today and the possible directions of city life in the future. I also believe that our physical environments can hold solutions for today's urban problems. In "Minimal Surfaces as Urban Forms," I explore a branch of complex geometries and their potential to transcend into urban applications. I also examine the peculiarities and characteristics of minimal surfaces, and compare their features to different aspects of urban life. In the near future, I plan to attend architecture graduate school and continue my exploration of our urban environments and their physical manifestations.

BRETT THOMAS

Brett James Thomas is a third generation Los Angeles native. He moved to San Francisco in July of 2011. Brett is currently enrolled in the Urban Planning and Studies major at San Francisco State University. Brett's focus of study has centered on transportation planning and land use. He has taken several architecture and design classes prior to enrollment at SFSU and plans to continue his education by enrolling in an Urban Design Graduate Program, after his graduation in May of 2013. Brett believes that one of San Francisco's strongest attributes is the ease of access to opportunity sites the City's residents enjoy. The N-Judah is a major factor of this ease of access for many residents, but has reached its functional limit. Along with a brief history of the line, Brett's paper explores the reasons for reaching this limit and what can be done to correct the situation.

CHRIS MORRIS

Coming of age as a ward of the state, and being moved from city to city, I was acutely aware of the governing bodies that dictated my life as a youth. I was consistently reminded through my state appointed relationships how my opportunities and limitations were set by the powers that be. Grateful for the assistance received at times and disconcerted by the lack of appropriations at others, I began to realize how the formulation of policy in another location, by people whom I had never met, shaped not only my life but scores of others. Unable to articulate my world-view and becoming increasingly frustrated as to what or how I could use this experience, I settled on simply furthering my education. Discovering the urban studies and planning major offered at San Francisco State University, I felt as though I was chosen rather than having chosen it. Upon graduation I plan on using my experience and skill to begin a career in policy analysis that will better inform those who formulate policy. The piece, *Occupy: The Backlash to Voter Disenfranchisement* is merely another reflection of my passion for those who struggle to be engaged, and the forces that create those impasses.

T. MICHAEL LILES

T. Michael Liles is an urban studies and planning student, a published author and a periodicals aficionado at San Francisco State University. He is currently working with the American Planning Association California Chapter Northern Section Sustainability Committee to create a learning and practice network for city planners who are interested in sustainability planning. Dedicated to education and equity, he worked as a coordinator for the Book Loan Program at City College of San Francisco and has worked with Equality California to help achieve equal rights for lesbian, gay, bisexual and transgender persons. Although Michael has lived in several states (Montana, Utah, Washington and New York), he calls California his home. In his spare time, he enjoys contemplating the mysteries of the universe and drinking coffee.

CHRIS BRODEUR

Christopher Brodeur was recently involved in a tragic motorcycle accident. After extensive surgeries and long recovery processes, Chris is finally on his way to seeing better days again. Prior to his accident he wrote his piece, *Parking and Employment*, which explains the difficulties poorer San Francisco communities face when having to pay extensive parking fees. His piece examines the disparities and takes a look at important statistics that help to explain why driving is necessary for underprivileged communities, but also why parking fees must be alleviated in order to not push them into further poverty.

SONJA GAJIC

My piece is a reflection on my career aspirations. I ultimately want to become a community organizer involved with bridging the gap between underprivileged minority communities and the green sector of the economy-building the field of environmental jobs while closing the gap of social inequities. I am currently a student in the Urban Studies Department, with a minor in Race and Resistance Studies, and have helped worked on Urban Action the last academic school year. I joined the journal to help support my other interest-writing-and using it to produce well-written, academic pieces to inform our community on any and all issues pertaining to the urban sphere.

ANDEY NUNES

Andey Nunes is a Certified Sustainable Building Advisor and LEED Accredited Professional. He graduates SFSU in May 2012 with his BS-Environmental Studies: Earth System Science emphasis in Chemical Analysis. He is a CSME Climate Change Scholar and the 2011 recipient of the George Feliz memorial scholarship for Environmental Studies. His primary interests are industrial ecology, sustainable food systems & urban development, queer social & economic justice advocacy, and earth-based spirituality. Andey is also a single parent and lives in San Francisco with his son. His piece is focused on protecting and conserving historical buildings through the lens of a single case study: *Conserving the Future While Preserving the Past*.



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