Do Socioeconomic Factors Affect the Volume and Composition of Catch Basin Debris?

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Abstract

Stormwater runoff is the leading cause of water pollution in coastal watersheds. To ensure stormwater quality, Los Angeles retrofitted over 22,000 catch basins with screens to prevent trash from entering the storm drain system. Since commercial zones have the highest stormwater pollution generation rates, we investigated the variation in volume and composition of catch basin debris according to three socioeconomic factors (ethnicity, population density, and income), which were broken down into further subcategories. Using U.S. Census data (provided by WPD), we selected a total of ten survey sites, one for each subcategory, in commercial zones within the Los Angeles River Watershed. We calculated debris volume from a database of catch basin cleaning history (2008-2011) provided by the City of Los Angeles Bureau of Sanitation WPD and WCSD and measured composition by taking samples from catch basins with circle grate screens. We also considered the relationship between trash can availability and debris accumulation in catch basins.

The only statistically significant findings occurred between the Black and Asian populations and the Hispanic and Asian populations. Areas varying in income and population density did not show significant differences in catch basin volumes over the three-year time period. Trash can frequency in areas of different incomes showed a negative correlation with average debris volume, while trash can frequency in areas of different population densities showed a positive correlation. Our preliminary study of composition indicated that organic matter was the main component in all sampled catch basins with slight observable differences between variables.

Introduction

In Los Angeles, rain comes as a mixed blessing. While replenishing water supplies, rain bounces off cement, sloshing across the urban landscape, collecting trash, toxins, and bacteria as it slips into the storm drain system. Los Angeles's storm drain system delivers urban runoff, a concoction of various pollutants, directly into the ocean where it degrades beach quality and endangers marine life (Gregory, 2009; Santos et al., 2005). As the leading cause of pollution in coastal watersheds, non-point source urban runoff demands vigorous mitigation efforts (Lau et al., 2001).

Under the Clean Water Act, states must establish Total Maximum Daily Loads (TMDLs), outlining the maximum amount of pollutants a waterbody may receive while still available for all of its designated uses such as swimming or fishing. Originally adopted in 2001, the Los Angeles River Trash TMDL requires Southern California cities to reduce their trash discharge to waterbodies by 10% each year for 10 years, ultimately attaining 0% trash discharge by 2015 (LA Stormwater Program, 2001). According to the Water Quality Control Plan, Los Angeles regional waters "should not contain floating materials [...or] suspended or settled material in concentrations that cause nuisance or adversely affect beneficial use" (CRWQCB, 2010). The newly implemented Trash TMDL sparked political feuds as the city struggled to quantify and reduce trash discharge. Grappling with noncompliance, the Regional Water Quality Control Board amended the Trash TMDL in 2008, changing compliance requirements from a numerical to a technological limit. To meet the revised Trash TMDL, Los Angeles only needs to implement "Best Management Practices" (BMPs) for stormwater control, relying solely on technological efficiency.

Choosing from a broad range of BMPs, Los Angeles determined that retrofitting catch basins proved the most feasible and cost-effective. As the access point for urban runoff into the storm drain system, a catch basin consists of a depression beneath a drain inlet, allowing sediment to accumulate naturally (Pitt and Field, 2004). Modifying catch basins to capture trash, Los Angeles installed coverings on catch basin openings and inserts in catch basin outlets. As of 2008, Los Angeles has spent more than $39 million in retrofitting catch basins and intends to retrofit all catch basins throughout Los Angeles (LA Stormwater Program, 2001). While the catch basin retrofits fulfill the requirements for Los Angeles's Trash TMDL, trash runoff still pervades the Los Angeles River during and after storm events.

Urbanization increases the percentage of impermeable surface thereby causing an increase in transportation of polluted stormwater (Ha and Stenstrom, 2003). Furthermore, in heavily populated coastal areas such as Los Angeles beach attendees contribute a significant amount to the marine plastic pollution problem. For example, in Los Angeles County between 1973 and 1983 beachgoers doubled to 79 million and are reported to contribute about 75 tons of trash per week (Pruter, 1987). The pattern of high litter load in population dense areas is evident again from a study by the Watershed Protection Division in Los Angeles. Citywide, residential and commercial areas have the highest percentages of litter-filled catch basins (WPD, 2002). Litter in downtown Los Angeles and adjacent areas pose a severe problem in particular. Even though this is not a densely populated area, it serves as a major corridor and destination for many travels, either on foot or in a vehicle.

The volume and composition of litter in urban runoff is not uniform across all parts of Los Angeles; areas of different socioeconomic status in regards to population density, ethnicity, and income may be affected differently during storm events (Lippner et al., 2001). Fearing political implications, very few researchers dare examine the relationship between ethnicity and litter generation. In general, the literature insinuates that minorities suffer the highest risk for environmental health, accumulating higher amounts of waste in their neighborhoods (with the confounding factor of low income) (Ackerman and Mirza, 2001). Assessing environmental awareness, Flynn et al. (2006) surveyed different racial groups and found that non-white participants expressed greater environmental concern for their communities than white participants, highlighting their political inability to achieve environmental justice.

Various studies insinuate a relationship between income and litter generation, but they rarely directly address it. Characterizing litter generation according to beach users, Santos et al. (2005) determined that areas occupied by people of lower annual income generate twice as much litter as areas occupied by people of higher annual income. Marais et al. (2002) examined storm drain catchments in South Africa, finding an inverse relationship between income and litter loadings in residential areas. The researchers offer an explanation, suggesting that the low-income communities consist of informal housing and lack a reliable waste removal program. The studies suggest that income influences littering patterns by affecting behavior or the infrastructural ability to properly dispose of trash.

A study by the Department of Public Works labeled public education as a Best Management Practice as it "can be effective at preventing trash from getting into the storm drain system [and] can be targeted at problem populations or areas" (LADWP 2004). Studies have described the urban litter problem as behaviorally induced and because of this, education is indeed an effective "non-structural" best management practice; LADWP describes it as a component of its "second-best source control BMP's (Taylor et al., 2006)." In the study by Andre Taylor et al. (2006), it was found that an eight month education campaign done in highly populated Australian commercial areas was "modestly successful" at "reducing litter loads" onto the streets and "modestly successful" at changing the consumers' behaviors (Taylor et al., 2006). Perhaps because of its short eight month period of duration, this education campaign was only "modestly successful." Conducting a study over a longer period of time may display different littering behavior results; adding anti-littering into school curriculum could test this.

Using data provided by the Watershed Protection Division (WPD) and Waste Water System Division (WCSD) of the City of Los Angeles Bureau of Sanitation, our project aims to determine the relationship between socioeconomic factors and catch basin debris volume in the Los Angeles River Watershed. Our hypothesis is that areas of lower socioeconomic status (i.e., low income, high percentage of people of color, and high population density) will have higher debris volumes in catch basins compared to areas of higher socioeconomic status. We will also examine the composition of debris within catch basins in these areas to determine if socioeconomic factors influence composition. This analysis may reveal the effectiveness of catch basins as a best management practice for ensuring stormwater quality.

Methodology

Site Selection

To select the catch basins for our study, we limited ourselves to sites within the municipal boundaries of Los Angeles, the Los Angeles River Watershed, and commercial areas. We obtained 2000 Census demographic data from WPD and used ArcGIS to see the spatial distribution of income, ethnicity, and total population in census blocks within our outlined boundaries. In ArcGIS, we divided our socioeconomic factors into classification schemes. For income, we divided the income range of Los Angeles into tertiles of low income (\$0 - \$29,449), medium income (\$29,450 - 54,421), and high income (\$54,422+). For population density, we divided the total population of the census block by its area to obtain population density in units of number of people per square kilometers. Taking the range of population density for all the census blocks within Los Angeles, we divided population density into tertiles of low density (0 - 4,132 people/km2), medium density (4,133 - 8,999 people/km2), and high density (9000+ people/km2). For ethnicity, we selected Asians, Blacks, Hispanics, and Whites as our ethnic groups of interest. Looking at the number of people of each race per census block, we split the range of each race into four quartiles: the Asian population was classified according to 0-323, 324-869, 870-2100, and 2101-4659 Asians per census blocks; the Black population was classified according to 0-479, 480-1309 1310-2396, and 2397-4926 Blacks per census blocks; the Hispanic population was classified according to 0-1040, 1041-2276, 2277-3594, and 3595-9021 Hispanics per census block, and the White population was classified according to 0-1294, 1295-2388, 2389-3665, and 3666-6509 Whites per census block. We defined the fourth quartile as the highest concentration of that ethnic group. In ArcGIS, we overlaid our socioeconomic factors on a map. From our choices of blocks, we selected a street and used Google Maps to ensure our potential sites had the same standard of commercialization. We selected the following sites for our variables:

Income:

1. Low Income: 7th Street between Hill Street and Wall Street
2. Medium Income: Eagle Rock Boulevard between Colorado Boulevard and Ridgeview Avenue
3. High Income: Olympic Boulevard between Hill Street and Wall Street

Population Density:

4. Low Density: Ventura Boulevard between Encino Avenue and Hayvenhurst Avenue
5. Medium Density: Cesar E. Chavez Avenue between Alameda Street and Figueroa Street
6. High Density: Cesar E. Chavez Avenue between Evergreen Avenue and St. Louis Street

Ethnicity:

7. Asian: Broadway Street between Cesar E. Chavez Avenue and Bamboo Lane
8. Black: Broadway Street between 3rd Street and 8th Street
9. Hispanic: Figueroa Street between North Avenue 52 and South Avenue 60
10. White: Ventura Boulevard between Woodman Avenue and Sepulveda Boulevard

In selecting blocks, we only considered one factor and did not control for others i.e. when we selected a block for low income, we did not consider the population density or racial composition of that block. In essence, we executed our site selections as three separate experiments for socioeconomic factors of income, population density, and ethnicity. Due to time constraints, we could not survey for all variable combinations, rendering our project unsuitable for multivariate analysis.

Field Survey

During our field surveys, we measured the width, depth, and length of all the catch basins in our selected sites. From our measurements, we calculated the volume capacity for each catch basin. We recorded the location of each catch basin and the type of grate covering (circle, diamond, bar, or none). We also recorded the number and location of public trash cans, and performed a correlation analysis between the number of trash cans per kilometer and the debris volume.

Catch Basin Cleaning History

After selecting our catch basins, we located the catch basin ID in a database provided by the WPD and WCSD (see Table 1.1). This database contains catch basin cleaning histories from 2008 to 2011, stating the predominate type of debris and the extent to which the basin was filled (full, ¾ full, ½ full, ¼ full or clear) at the time of the catch basin cleaning. With the cleaning histories for our selected catch basins, we calculated the volume of debris in the basin for each recorded cleaning. Accounting for the high variability of debris in the basins for each cleaning, we averaged the total debris volume for each catch basin. We then added the average debris volume for all the basins within a study site and divided it by the number of catch basins in the site to obtain average debris volume per catch basin for each study site. For each socioeconomic factor, we used an analysis of variance (ANOVA) to determine if average debris volume differed according to our variables (see Table 1.2).

Catch Basin Selection for Composition Sampling

For the composition portion of our project, we narrowed our sample size down by only looking at the catch basins that have the most prevalent type of covering grate, the circle grate, to ensure uniformity in what debris may penetrate the covering. Within each socioeconomic factor, we selected catch basins with similar volume capacities to further ensure uniformity.

Composition

The composition component of the project involved taking one sample from each site. As a result, our data only reflects a snapshot of catch basin composition at a single point in time. Without multiple samplings to compare, we could not perform statistical tests for composition and instead, relied solely on observation.

We collected ten catch basin samples, one from each site. The specific catch basins are highlighted in Table 1.1. Using shovels, sanitation workers from the City of Los Angeles manually scooped out the contents of our chosen basins and bagged them. If the catch basin contained too much debris to fit in one bag, we were given only a portion of the content. If possible, we were given everything within the catch basin. Debris was compared in units of percent weight. The catch basin at the low-income study site was blocked by debris and filled with water. As a result, the samples obtained from this site were wet and had to be hand-dried in the lab. For each sample, we separated and weighed the contents according to the classification categories in Table 1.3 (below).

TABLE 1.3: SORTING CATEGORIES

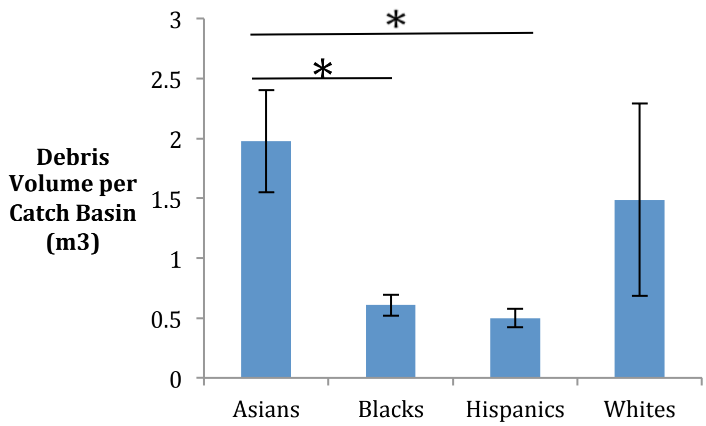
Paper	Plastic	Styrofoam	Metal	Cloth	Glass	Miscellaneous	Organic Matter
Cigarette Butts Newspapers Cardboard Food/Liquid Containers Miscellaneous Paper	Single Use Bags Wrappers Food/Liquid Containers Miscellaneous Plastics	Food/Liquid Containers Miscellaneous Styrofoam	Jewelry Miscellaneous Metal				

Results

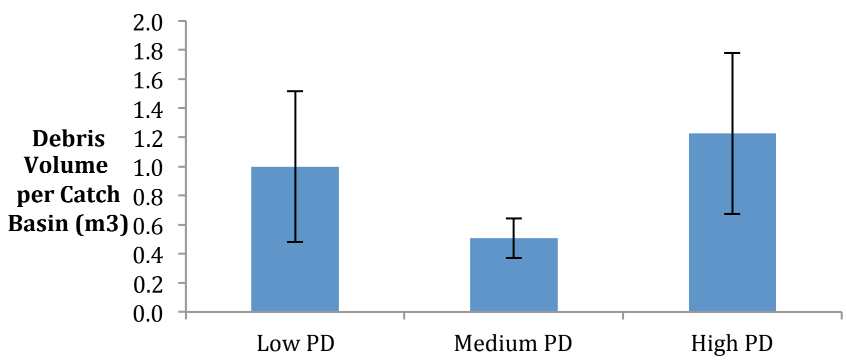
Catch Basin Debris Volumes

Within the same study site, high variation of averaged debris volumes existed for each catch basin, as shown in the appendix in Graphs 1.1-1.3 for our income sites, Graphs 1.5-1.7 for our population density sites, and Graphs 1.9-1.12 for our ethnic sites. We compared the debris volumes according to our factors, as shown in Graph 1.4 for ethnicity, Graph 1.8 for population density, and Graph 1.13 for income. We found statistically significant differences between the average debris volumes of catch basins with respect to ethnicity (ANOVA; $P = 0.0005$). Further t-tests revealed statistical differences between the average debris volume for Asian and Black populations and Asian and Hispanic populations, but not between any other ethnicity groups. No statistical difference was found between the average debris volumes of populations of people of color and White populations. No statistical difference was found between the average debris volumes of high, medium and low income areas ($p=0.71$). Similarly, no statistical difference was found between the average debris volumes of high, medium and low population density areas ($p=0.50$). For ANOVA analyses and t-tests, see Table 1.4-1.5.

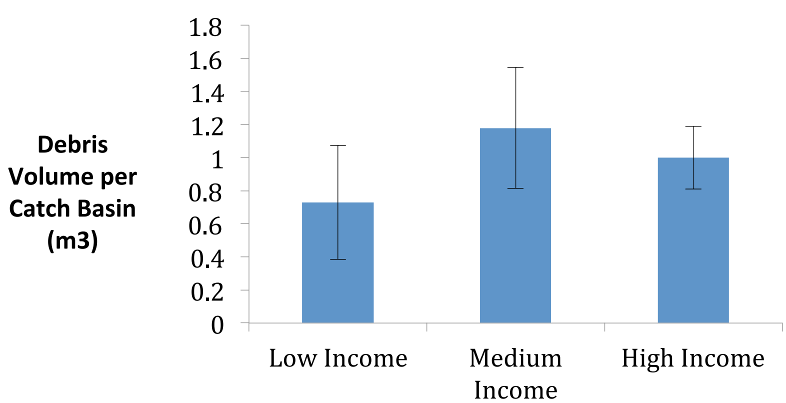
GRAPH 1.4: DEBRIS VOLUME PER CATCH BASIN IN ALL ETHNICITY AREAS (2008-2011)



GRAPH 1.8: DEBRIS VOLUME PER CATCH BASIN IN ALL POPULATION DENSITY AREAS (2008-2011)



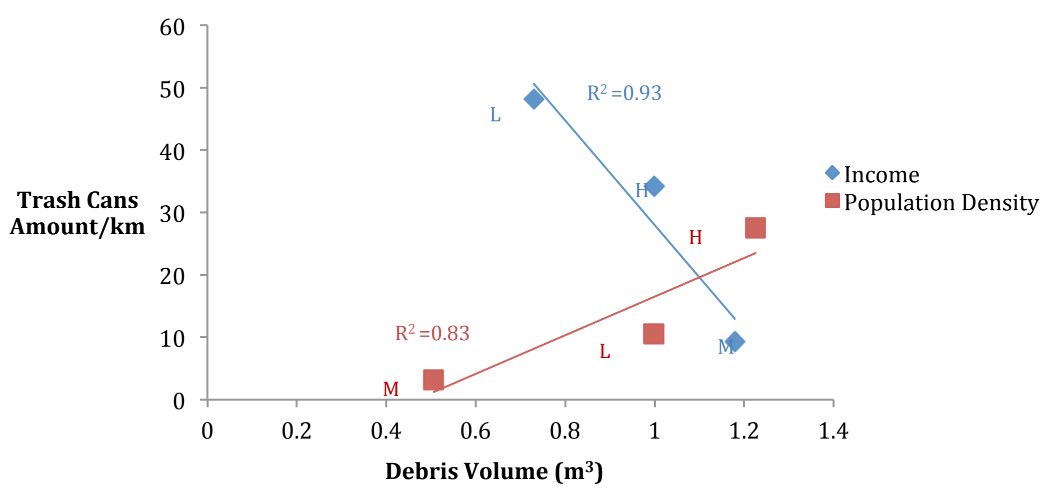
GRAPH 1.13: DEBRIS VOLUME PER CATCH BASIN IN ALL INCOME AREAS (2008-2011)



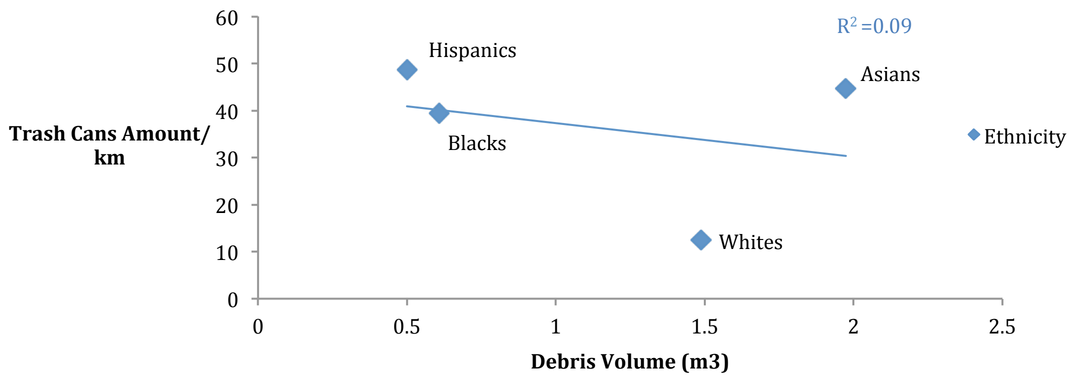
To explain the differences between debris volumes, we examined trash can availability in the sites. Interestingly, the number of trash cans per km is lowest in the medium income area, with more trash cans in the high income area, and the most in the low income area. Still, there was a strong negative correlation between the number of trash cans and the average debris volume between incomes (r^2 = 0.93), as shown in Graph 1.17a. When looking at population density, the number of trash cans per km is lowest in the medium population density area, with more trash cans in the low density area and the most in the high density area. There is a strong positive correlation between the number of trash cans and the average debris volume between the population density sites (r^2 = 0.83), as shown in Graph 1.17a. A correlation analysis between the number of trash cans and the average debris volume of each ethnicity site revealed a very weak correlation (r^2 = 0.09), as shown in Graph 1.17b.

GRAPH 1.17: CORRELATION BETWEEN DEBRIS VOLUME PER CATCH BASIN AND TRASH CANS AMOUNT

a) Income and Population Density Areas



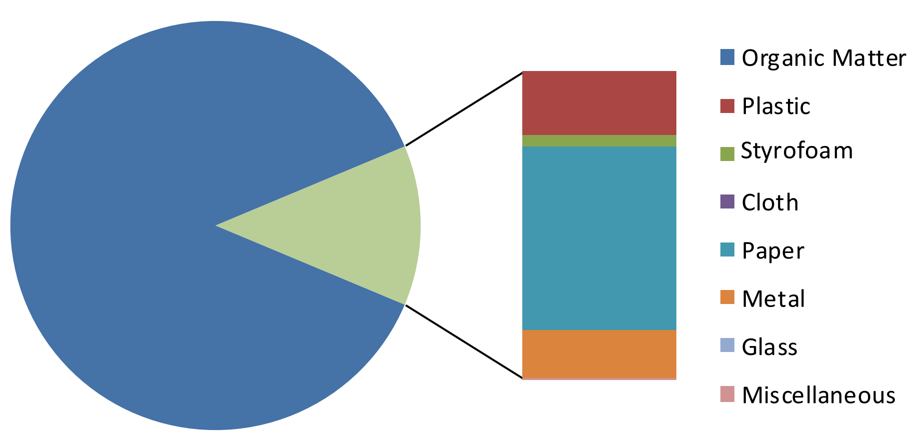
b) Ethnicity Areas



Composition

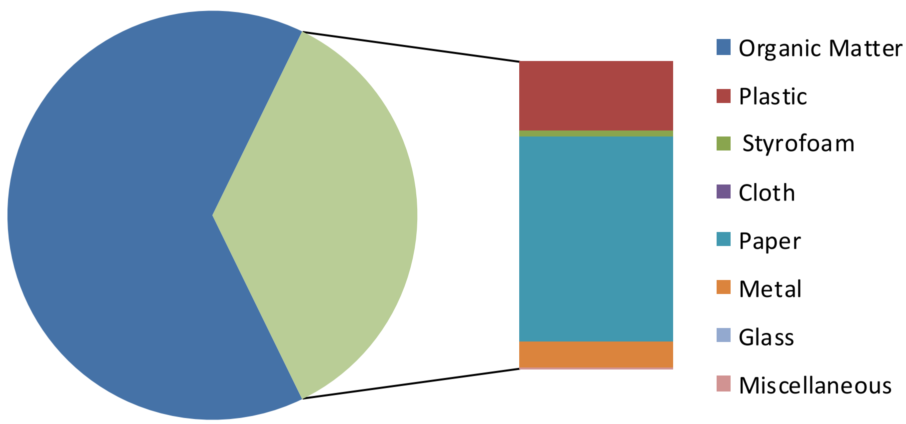
Only slight observable differences were found among the composition percentages within income and population density. The ethnicity sample sites had varying percentages of organic matter. Within this socioeconomic factor, the percentage of organic matter differed between 49.3% in the White population (Graph 2.12) to 87.4% in the Hispanic population (Graph 2.9). The Black and Asian areas had similar organic matter contributions of 57.0% and 64.4%, respectively (Graph 2.10, 2.11).

GRAPH 2.9: HISPANIC ETHNICITY CATCH BASIN COMPOSITION



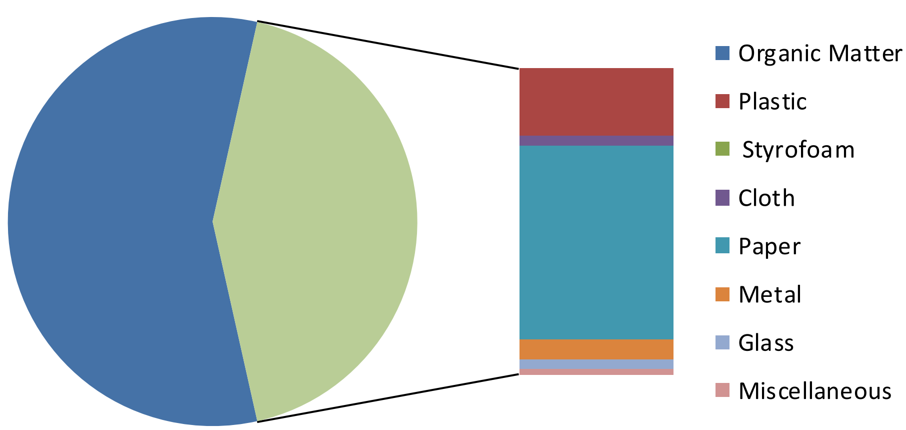
Hispanics	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	87.36%	2.58%	0.48%	0.01%	7.59%	1.98%	0.00%	0.00%

GRAPH 2.10: ASIAN ETHNICITY CATCH BASIN COMPOSITION



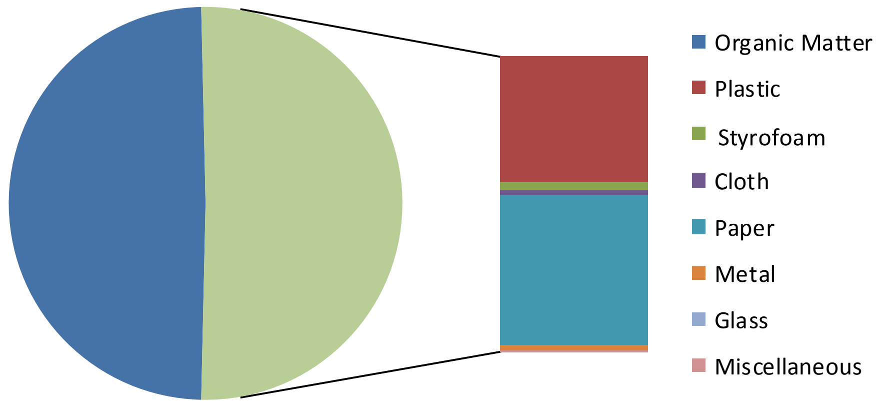
Asians	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	64.44%	7.90%	0.77%	0.01%	23.66%	3.11%	0.00%	0.12%

GRAPH 2.11: BLACK ETHNICITY CATCH BASIN COMPOSITION



Blacks	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	57.01%	9.45%	0.00%	1.40%	27.25%	2.61%	1.49%	0.79%

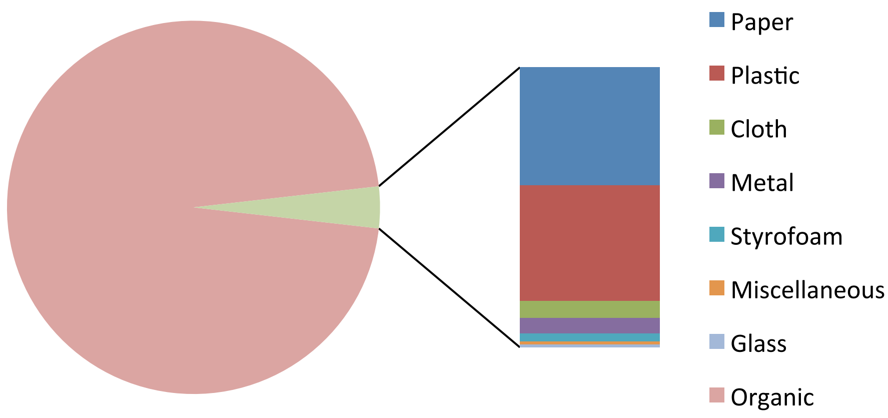
GRAPH 2.12: WHITE ETHNICITY CATCH BASIN COMPOSITION



Whites	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	49.29%	21.88%	1.13%	0.97%	25.59%	1.03%	0.10%	0.00%

As no major differences were found between socioeconomic factors, the composition totals were taken as a whole for all of our study sites. The overwhelming majority among our samples proved to be organic matter, making up 76.7% of the weight of our samples on average. For all sites combined, organic matter made up 96.6% of the total weight (see Graph 2.1).

GRAPH 2.1: ALL SITES COMPOSITION BREAKDOWN (WITH ORGANIC MATTER)

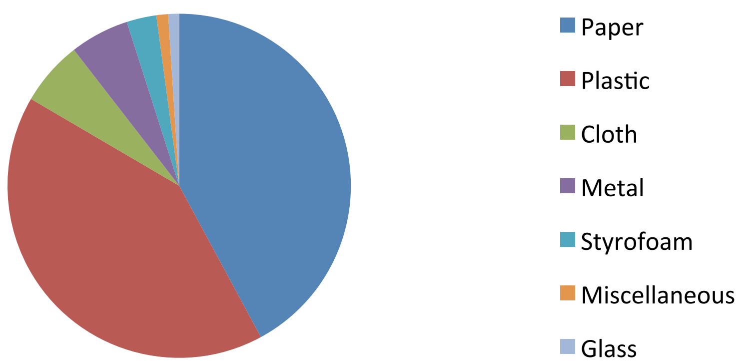


All Sites - With Organic	Percentage by Weight
Paper	1.52%
Plastic	1.49%
Cloth	0.22%

Metal	0.20%
Styrofoam	0.10%
Miscellaneous	0.04%
Glass	0.04%
Organic	96.39%

For further analysis of the more clearly anthropogenic pollution sources, we removed organic matter from the composition totals. With organic matter removed, paper products made up the majority of the composition (42.1%), followed closely by plastic (41.3%) (see Graph 2.2).

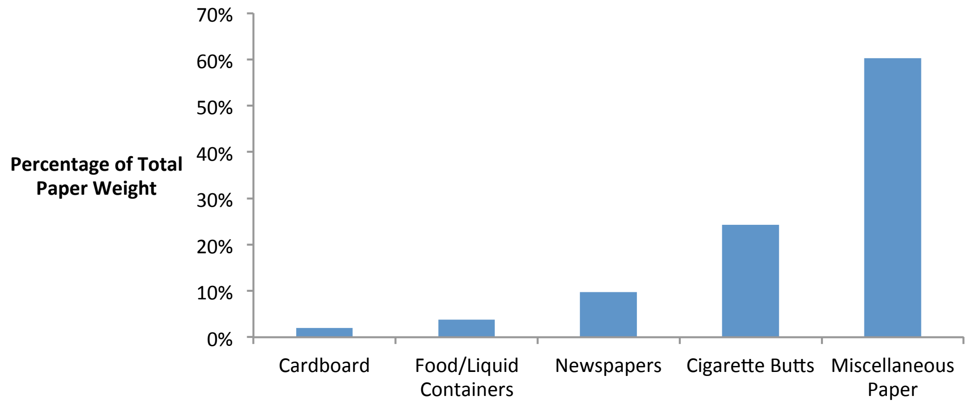
GRAPH 2.2 ALL SITES COMPOSITION BREAKDOWN (WITHOUT ORGANIC MATTER)



All Sites - Without Organic	Percentage by Weight
Paper	42.1%
Plastic	41.3%
Cloth	6.07%
Metal	5.57%
Styrofoam	2.80%
Miscellaneous	1.11%
Glass	1.02%

The most prevalent subcategory of paper was miscellaneous paper, comprised of small unidentifiable pieces of paper or paper that could not be sorted into one of the other subcategories. These pieces constituted 25.4% of the total weight and 60.3% of the total paper (see Graph 2.20 below). Cigarette butts made up the second most prevalent subcategory comprising 10.2% of the total weight and 24.3% of the total paper weight, despite their small size.

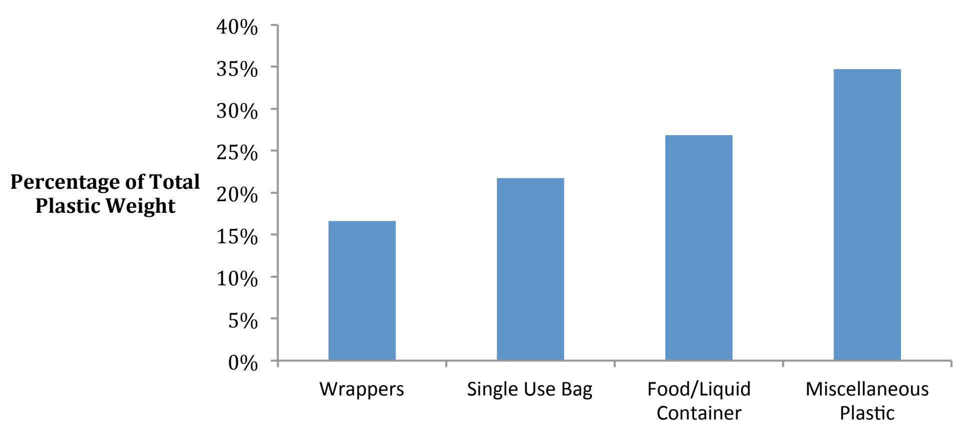
GRAPH 2.20: PAPER SUBCATEGORY PERCENTAGE IN ALL SITES



Variable	Cigarette Butts	Newspapers	Food/Liquid Containers	Cardboard	Miscellaneous Paper	Total Weight
Percent	24.3%	9.76%	3.76%	1.93%	60.3%	1014
Weight	246	98.9	38.1	19.6	611	

The most prevalent subcategory of plastic was miscellaneous plastic. These pieces constituted 14.3% of the total weight and 34.7% of the total plastic (see Graph 2.21 below). Food and liquid containers were the second most prevalent subcategory comprising 11.1% of the total weight and 26.9% of total plastic weight. Single-use bags constituted only 8.99% of the total weight and 21.8% of the total plastic.

GRAPH 2.21: PLASTIC SUBCATEGORY PERCENTAGE IN ALL SITES



Variable	Wrappers	Single Use Bag	Food/Liquid Container	Miscellaneous Plastic	Total Weight
Percent	16.6%	21.8%	26.9%	34.7%	995
Weight	217	165	267	345	

Discussion

Catch basin debris volumes varied substantially within the same site, paralleling the Caltrans pilot study on litter management. For two years, Caltrans evaluated litter in catch basins and observed variability in litter type and amount in the same collection sites and between collection sites (Lippner et al., 2001).

The socioeconomic factor of ethnicity did affect catch basin debris as seen in the differences between the Asian and Black populations and the Asian and Hispanic populations. However, income and population density did not appear to influence catch basin debris. This is in contrast to other studies, which showed that high population densities increased litter amounts (Pruter, 1987; WPD, 2002). Similarly, areas of lower income were reported as generating twice as much litter than higher income areas (Santos et al, 2005). Our project assumes that litter is the source of catch basin debris and that higher litter production will result in more catch basin debris.

The ethnicity sites for Asian, Black, and Hispanic populations differed by numerous factors, including type of commercial buildings. The Asian site was located in Chinatown, a prominent tourist attraction noted for its proliferation of inexpensive imports. The stretch we selected for the Asian site mainly consisted of shops and restaurants. Chinatown receives a large number of visitors who may litter, accounting for the Asian site's large volume of catch basin debris. The Black site was located in Downtown Broadway Theater District, which consists of historic theaters and shops. The reduced debris in the Black site, compared to the Asian site, may be due to municipal attention given to the Black site in order to preserve the historic integrity of the Theater District. Our Black site also crosses into the Jewelry District. Compared to stores that provide waste materials such as food containers or plastic bags, jewelry stores may produce less waste and littering potential. The Hispanic site was located in Highland Park, which is less commercialized than the Asian site. Residential houses could be seen a block over from our selected street. The Hispanic site consisted mainly of one-story shops, but we did encounter a church and school. The degree of commercialization may have accounted for the differences between the Asian site and Hispanic site.

We then looked at trash can availability to explain differences in debris volume. The correlation analyses between the number of trash cans and debris volume within a site showed opposing trends. For income, debris volume was negatively correlated with trash can amount while for population density, debris volume was positively correlated with trash can amount. The income correlation can be explained by the concept that more trash cans will result in less litter and thus less debris in the catch basins. The population density correlation can be explained by the concept that providing more trash cans may encourage increased trash generation and thus, more litter. For ethnicity, there was no correlation between debris volume and trash can amount, showing that trash can availability did not influence debris volume. However, it is interesting to note that the Asian, Black, and Hispanic sites had similar numbers of trash cans: 45 trash cans/km, 39 trash cans/km, and 49 trash cans/km, respectively. Confounding factors such as street sweeping frequency, volume of foot traffic, and trash pickup frequency may also exist, affecting the validity of the correlation trends.

Our composition results revealed that organic matter dominated catch basin debris (by weight) for all sites. Previous studies also identified suspended sediment as the largest constituent of runoff (James, 2002). Although natural in source, this debris could be problematic. Consisting of decaying leaves, soil, sediment, and suspended sediment, organic matter absorbs nonpolar chemicals and transports them into the stormwater system during rain events. Over 50% of toxic chemicals in stormwater are adhered to suspended sediment, signifying the need for sediment control as a means to reduce metal runoff (Lau et al. 2001).

After organic matter, paper and plastic were the next most dominant contributors to catch basin debris. Since the most prevalent subcategory for both paper and plastic were miscellaneous and unidentifiable, we suggest further research with a more precise classification system that is able to identify the pieces that we could not.

Our composition analysis also showed that items larger than the openings (1.9 cm diameter) in the circle grate coverings are getting into the catch basins. This problem may result from the design of the covering, which is engineered to swing inward at the bottom edge when debris builds up outside of it to prevent flooding on the streets during a storm event. Street cleaning frequency may also be related to this issue; if sweeping is not frequent enough, and debris builds up outside of the grate, the grate will cave in, allowing large debris to fall inside. Finally, the openings are large enough for cigarette butts to easily flow through. The toxins present in cigarette butts are disproportional to their small size and have large harmful effects on aquatic life (Novotny et al., 2009).

Conclusion

Very little is known about the quantity and characterization of litter in the storm drain system (Marais et al. 2001). Our study attempted to clarify the ambiguous nature of this debris and contribute to the current, yet scarce, literature. We analyzed catch basin debris – the street material that is swept into catch basins and theoretically can enter the storm system – according to socioeconomic factors of income, population density, and ethnicity. We hypothesized that areas of low income, high population density, and people of color will have higher quantities of trash within their catch basins. Our results yielded no statistical significance between income and population density levels. Only the ethnic groups: Asians versus Blacks and Asians versus Hispanics were statistically different in catch basin content volume. Interestingly, catch basin debris volume increased with number of trash cans when grouped by population density and decreased with number of trash cans when grouped by income. Analyzing composition by weight, we found that organic matter dominated catch basins, with paper and plastic products as the second most prevalent constituents.

Due to our study's limitations, we recommend further research of catch basin content in order to identify (and potentially control) the highest polluting areas and trash type. Further research should focus on the potentially confounding factors identified in our discussion, such as the effects of other socioeconomic factors, street cleaning frequency, and foot traffic. Further studies may also look into the variation between catch basin content and volume in non-commercial areas, such as areas zoned for industrial or residential use.

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APPENDIX I

TABLE 1.1 CATCH BASIN CLEANING HISTORIES (WPD & WCSD) AND DEBRIS VOLUME

INCOME							
Variable of Interest	Catch Basin ID	Graph (Catch Basin Number)	Cleaning Date	Description	Catch Basin Volume (m^3)	Calculated Debris Volume (m^3)	Debris Vol/ Catch Basin (m^3)
High Income	51611461111202	1.1 (1)	7/22/2008	Debris-Moderate	2.399	1.599	0.933
			12/18/2008	Trash 1/2 Full		1.200	
			5/14/2009	Debris-Light		0.800	
			10/9/2009	Debris-Light		0.800	
			1/11/2010	Dirt/Rock/Soil 1/4 Full		0.600	
			11/4/2010	Trash 1/4 Full		0.600	
	51611461111158	1.1 (2)	7/7/2008	Debris - Light	4.798	1.599	1.777
			12/18/2008	Trash 1/2 Full		2.399	
			2/2/2009	Trash 1/4 Full		1.200	
			4/13/2009	Trash 1/4 Full		1.200	
			5/18/2009	Debris - Light		1.599	
			10/7/2009	Trash 1/2 Full		2.399	
			1/11/2010	Dirt/Rock/Soil 1/4 Full		1.200	
			11/8/2010	Trash 1/4 Full		1.200	
			3/16/2011	Debris - Moderate		3.199	
	51611461111168	1.1 (3)	7/22/2008	Debris - Moderate	2.879	1.919	1.280
			12/18/2008	Trash 1/2 Full		1.439	
			5/20/2009	Debris - Light		0.960	
			10/9/2009	Debris - Moderate		1.919	
			1/13/2010	Dirt/Rock/Soil 1/4 Full		0.720	
			11/8/2010	Trash 1/4 Full		0.720	
	51611461111193	1.1 (4)	7/22/2008	Debris - Moderate	1.759	1.173	0.782
			10/18/2008	Trash 1/2 Full		0.880	
			5/20/2009	Debris - Light		0.586	
			10/9/2009	Debris - Moderate		1.173	
			1/13/2010	Dirt/Rock/Soil 1/4 Full		0.440	
			11/8/2010	Trash 1/4 Full		0.440	

	5161146111223	1.1 (5)	7/22/2008	Debris - Moderate	1.671	1.114	0.743
			12/18/2008	Trash 1/2 Full		0.836	
			5/18/2009	Debris - Light		0.557	
			10/19/2009	Debris - Moderate		1.114	
			1/11/2010	Dirt/Rock/Soil 1/4 Full		0.418	
			11/10/2010	Trash 1/4 Full		0.418	
	5161146111269	1.1 (6)	7/10/2008	Debris - Light	1.226	0.409	0.477
			12/18/2008	Trash 1/2 Full		0.613	
			5/18/2009	Debris - Light		0.409	
			10/19/2009	Debris - Moderate		0.817	
			1/11/2010	Dirt/Rock/Soil 1/4 Full		0.306	
			11/10/2010	Trash 1/4 Full		0.306	
	from all catch basins in site						0.999
Medium Income	4461046111124	1.2(1)	8/26/2008	Debris-Light	2.819	0.940	1.136
			2/23/2009	Dirt/Rock/Soil 1/4 Full		0.705	
			7/14/2009	Dirt/Rock/Soil 1/4 Full		0.705	
			10/27/2009	Trash 3/4 Full		2.114	
			7/6/2010	Trash 1/4 Full		0.705	
			1/19/2011	Trash 1/4 Full		0.705	
			5/17/2011	Debris-Moderate		1.879	
	4461046111076	1.2(2)	8/20/2008	Debris-Light	4.809	1.603	1.283
			2/23/2009	Dirt/Rock/Soil 1/4 Full		1.202	
			7/14/2009	Clear		0.000	
			10/28/2009	Trash 1/4 Full		1.202	
			1/10/2011	Dirt/Rock/Soil 1/2 Full		2.405	
	4461046111101	1.2(3)	8/28/2008	Trash 1/4 Full	1.578	0.394	0.500
			2/23/2009	Dirt/Rock/Soil 1/4 Full		0.394	
			7/14/2009	Green Waste 1/4 Full		0.394	
			10/28/2009	Debris-Light		0.526	
			1/6/2011	Dirt/Rock/Soil 1/2 Full		0.789	
	4461446111017	1.2(4)	8/28/2008	Trash 1/4 Full	0.798	0.200	0.266
			2/23/2009	Debris-Light		0.266	
			7/14/2009	Green Waste 1/4 Full		0.200	
			10/28/2009	Debris-Light		0.266	
			1/10/2011	Dirt/Rock/Soil 1/2 Full		0.399	
	4461446111105	1.2(5)	8/28/2008	Trash 1/4 Full	0.618	0.155	0.272
			10/1/2008	Debris-Light		0.206	
			2/23/2009	Debris-Light		0.206	
			3/18/2009	Debris-Moderate		0.412	
			7/13/2009	Green Waste 1/4 Full		0.155	

			11/2/2009	Green Waste 1/4 Full		0.155	
			1/13/2011	Trash Full		0.618	
	4461446111056	1.2(6)	8/26/2008	Dirt/Rock/Soil 1/4 Full	5.941	1.485	1.980
			2/18/2009	Green Waste 1/4 Full		1.485	
			7/13/2009	Green Waste 1/4 Full		1.485	
			11/2/2009	Green Waste 1/4 Full		1.485	
			12/15/2010	Debris-Moderate		3.960	
	4461446111070	1.2(7)	8/26/2008	Trash 1/4 Full	0.789	0.197	0.263
			2/18/2009	Trash 1/4 Full		0.197	
			7/13/2009	Green Waste 1/4 Full		0.197	
			11/2/2009	Green Waste 1/4 Full		0.197	
			12/15/2010	Debris-Moderate		0.526	
	4461446111055	1.2(8)	8/26/2008	Dirt/Rock/Soil 1/4 Full	12.193	3.048	4.064
			2/18/2009	Trash 1/4 Full		3.048	
			7/13/2009	Green Waste 1/4 Full		3.048	
			11/3/2009	Green Waste 1/4 Full		3.048	
			12/15/2010	Debris-Moderate		8.129	
	4461046111114	1.2(9)	8/20/2008	Debris-Light	2.953	0.984	1.034
			2/23/2009	Debris-Light		0.984	
			7/20/2009	Green Waste 1/4 Full		0.738	
			10/28/2009	Debris-Light		0.984	
			1/5/2011	Dirt/Rock/Soil 1/2 Full		1.476	
	4461046111079	1.2(10)	8/20/2008	Debris-Light	2.649	0.883	0.994
			2/23/2009	Dirt/Rock/Soil 1/4 Full		0.662	
			7/28/2009	Green Waste 1/4 Full		0.662	
			10/28/2009	Trash 1/4 Full		0.662	
			1/6/2011	Dirt/Rock/Soil 1/2 Full		1.325	
			5/17/2011	Debris-Moderate		1.766	
	4461046111049	Cleaning History Not Available					
	from all catch basins in site						1.179
Low Income	5161146111071	1.3(1)	7/10/2008	Trash 1/2 Full	3.252	1.626	1.761
			12/11/2008	Trash 1/4 Full		0.813	
			10/7/2009	Trash 1/2 Full		1.626	
			1/6/2010	Trash 3/4 Full		2.439	
			11/9/2010	Trash 1/4 Full		0.813	

			4/4/2011	Dirt/Rock/Soil Full		3.252	
	5161146111101	1.3(2)	7/22/2008	Trash 1/4 Full	1.357	0.339	0.433
			12/24/2008	Trash 1/4 Full		0.339	
			5/12/2009	Debris-Light		0.452	
			10/7/2009	Trash 1/2 Full		0.678	
			11/5/2010	Trash 1/4 Full		0.339	
			3/16/2011	Debris-Light		0.452	
	5161146111124	1.3(3)	7/22/2008	Trash 1/4 Full	1.078	0.270	0.409
			12/24/2008	Trash 1/2 Full		0.539	
			1/28/2009	Trash 1/4 Full		0.270	
			3/31/2009	Trash 1/2 Full		0.539	
			5/14/2009	Debris-Light		0.359	
			10/7/2009	Trash 1/2 Full		0.539	
			1/7/2010	Trash 1/2 Full		0.539	
			11/5/2010	Trash 1/4 Full		0.270	
			3/16/2011	Debris-Light		0.359	
	5161146111133	1.3(4)	7/15/2008	Trash 1/4 Full	0.987	0.247	0.315
			12/24/2008	Trash 1/4 Full		0.247	
			5/14/2009	Debris-Light		0.329	
			10/7/2009	Trash 1/2 Full		0.493	
			11/3/2010	Trash 1/4 Full		0.247	
			3/16/2011	Debris-Light		0.329	
	5161146616104	Cleaning History Not Available					
	for all catch basins in site						0.730

POPULATION DENSITY

Variable of Interest	Cleaning Date		Cleaning Date	Description	Catch Basin Volume (m^3)	Calculated Debris Volume (m^3)	Debris Vol/Catch Basin (m^3)
High PD	5150646111078	1.5(1)	8/14/2008	Debris-Light	0.930	0.310	0.380
			1/12/2009	Trash 1/2 Full		0.465	
			3/5/2009	Trash 1/4 Full		0.233	
			7/2/2009	Trash 1/4 Full		0.233	
			9/30/2009	Cement Products 1/2 Full		0.465	

51511461111073	1.5(2)	12/10/2009	Trash 1/2 Full	7.341	0.465	1.835
		2/22/2010	Trash 1/4 Full		0.233	
		4/12/2011	Debris-Moderate		0.620	
		7/24/2008	Trash 1/4 Full		1.835	
		11/4/2009	Trash 1/4 Full		1.835	
		7/13/2010	Trash 1/4 Full		1.835	
		12/17/2010	Trash 1/4 Full		1.835	
51511461111019	1.5(3)	7/24/2008	Trash 1/4 Full	0.703	0.176	0.513
		1/12/2009	Trash 1/2 Full		0.352	
		3/9/2009	Trash 1/2 Full		0.352	
		9/30/2009	Trash 1/2 Full		0.352	
		11/4/2009	Trash 1/4 Full		0.176	
		2/16/2010	Trash 3/4 Full		2.391	
		7/13/2010	Trash 1/4 Full		0.176	
		12/17/2010	Trash 1/4 Full		0.176	
		4/12/2011	Debris-Moderate		0.469	
51511461111046	1.5(4)	7/24/2008	Trash 1/4 Full	0.482	0.120	0.120
		11/4/2009	Trash 1/4 Full		0.120	
		7/1/2010	Trash 1/4 Full		0.120	
		12/17/2010	Trash 1/4 Full		0.120	
51511461111013	1.5(5)	7/24/2008	Trash 1/4 Full	1.487	0.372	0.465
		11/4/2009	Trash 1/4 Full		0.372	
		7/6/2010	Trash 1/2 Full		0.743	
		12/17/2010	Trash 1/4 Full		0.372	
51506461111077	1.5(6)	8/14/2008	Debris-Light	2.299	0.766	0.939
		1/12/2009	Trash 1/2 Full		1.149	
		3/4/2009	Trash 1/4 Full		0.575	
		7/2/2009	Trash 1/4 Full		0.575	
		9/30/2009	Cement Products 1/2 Full		1.149	
		12/10/2009	Trash 1/2 Full		1.149	
		2/22/2010	Trash 1/4 Full		0.575	
		7/1/2010	Trash 1/2 Full		1.149	
		12/27/2010	Debris-Light		0.766	
		4/12/2011	Debris-Moderate		1.533	
51506461111072	1.5(7)	8/14/2008	Debris-Light	1.751	0.584	0.677
		1/12/2009	Trash 1/2 Full		0.876	
		3/5/2009	Trash 1/2 Full		0.876	

			7/2/2009	Trash 1/4 Full		0.438	
			9/30/2009	Cement Products 1/2 Full		0.876	
			12/10/2009	Trash 1/2 Full		0.056	
			2/22/2010	Trash 1/4 Full		0.438	
			7/1/2010	Trash 1/2 Full		0.876	
			12/27/2010	Debris-Light		0.584	
			4/12/2011	Debris-Moderate		1.168	
	for all catch basins in site						0.704
	51604461111111	1.6(1)	7/9/2008	Debris-Light	0.797	0.266	0.340
			12/24/2008	Debris-Light		0.266	
			1/28/2009	Debris-Moderate		0.531	
			4/6/2009	Trash 1/4 Full		0.199	
			5/6/2009	Trash 1/4 Full		0.199	
			10/9/2009	Trash 1/4 Full		0.199	
			1/24/2011	Debris - Severe		0.797	
			5/9/2011	Debris-Light		0.266	
Medium PD	51604461111106	1.6(2)	7/9/2008	Debris-Light	2.593	0.864	0.895
			12/24/2008	Debris-Light		0.864	
			1/28/2009	Debris-Moderate		1.729	
			4/7/2009	Trash 1/4 Full		0.648	
			5/12/2009	Trash 1/4 Full		0.648	
			10/9/2009	Trash 1/4 Full		0.648	
			11/23/2010	Debris-Light		0.864	
	51604461111058	1.6(3)	12/24/2008	Debris-Light	2.897	0.966	0.773
			5/5/2009	Trash 1/4 Full		0.724	
			10/9/2009	Trash 1/4 Full		0.724	
			11/23/2010	Trash 1/4 Full		0.724	
			5/10/2011	Trash 1/4 Full		0.724	
	51604461111030	1.6(4)	7/9/2008	Debris-Light	0.798	0.266	0.222
			12/24/2008	Debris-Light		0.266	
			5/5/2009	Trash 1/4 Full		0.200	
			10/8/2009	Trash 1/4 Full		0.200	
			11/23/2010	Trash 1/4 Full		0.200	
			5/10/2011	Trash 1/4 Full		0.200	
	51604461111055	1.6(5)	7/9/2008	Debris-Light	1.032	0.344	0.301
			12/24/2008	Debris-Light		0.344	
			1/28/2009	Debris-Light		0.344	
			4/7/2009	Trash 1/4 Full		0.258	
			5/5/2009	Trash 1/4 Full		0.258	
			10/9/2009	Trash 1/4 Full		0.258	

			11/23/2010	Debris-Light		0.344	
			5/10/2011	Trash 1/4 Full		0.258	
	5160461111120	Cleaning History Not Available					
	for all catch basin in site						0.5062
Low PD	4400446111019	1.7(1)	9/23/2008	Green Waste 1/4 Full	1.839	0.460	0.569
			3/3/2009	Debris-Light		0.613	
			7/14/2009	Debris-Light		0.613	
			11/25/2009	Debris-Light		0.613	
			8/30/2010	Debris-Light		0.613	
			12/15/2010	Debris-Light		0.613	
			6/16/2011	Green Waste 1/4 Full		0.460	
	4400446111020	1.7(2)	9/23/2008	Green Waste 1/4 Full	3.481	0.870	1.119
			3/3/2009	Debris-Light		1.160	
			7/14/2009	Debris-Light		1.160	
			11/25/2009	Debris-Light		1.160	
			9/13/2010	Debris-Light		1.160	
			12/15/2010	Debris-Light		1.160	
			6/16/2011	Debris-Light		1.160	
	4400446111018	1.7(3)	9/23/2008	Green Waste 1/4 Full	0.545	0.136	0.175
			3/3/2009	Debris-Light		0.182	
			7/14/2009	Debris-Light		0.182	
			11/25/2009	Debris-Light		0.182	
			9/13/2010	Debris-Light		0.182	
			12/15/2010	Debris-Light		0.182	
			6/16/2011	Debris-Light		0.182	
	4410146111010	1.7(4)	9/23/2008	Trash 1/4 Full	10.228	2.557	3.495
			10/17/2008	Trash 3/4 Full		7.671	
			11/1/2008	Clear		0.000	
			3/2/2009	Debris-Light		3.409	
			5/27/2009	Trash 1/4 Full		2.557	
			7/13/2009	Debris-Light		3.409	
			10/6/2009	Dirt/Rock/Soil 1/4 Full		2.557	
			11/5/2009	Debris-Light		3.409	
			3/11/2010	Green Waste 1/4 Full		2.557	
			2/7/2011	Debris-Moderate		6.819	

	4410146111012	1.7(5)	9/23/2008	Trash 1/4 Full	0.839	0.210	0.340
			2/26/2009	Debris-Light		0.280	
			5/27/2009	Trash 1/4 Full		0.210	
			7/13/2009	Debris-Light		0.280	
			11/9/2009	Debris-Light		0.280	
			7/7/2010	Debris-Light		0.280	
			2/16/2011	Debris - Severe		0.839	
	4410146111042	1.7(6)	9/23/2008	Trash 1/4 Full	1.217	0.304	0.287
			3/2/2009	Debris-Light		0.280	
			6/11/2009	Dirt/Rock/Soil 1/4 Full		0.304	
			7/13/2009	Debris-Light		0.280	
			11/9/2009	Debris-Light		0.280	
			7/8/2010	Debris-Light		0.280	
			2/7/2011	Debris-Light		0.280	
	for all catch basins in site						0.997
ETHNICITY							
Variable of Interest	Catch Basin ID		Cleaning Date	Description	Catch Basin Volume (in^3)	Calculated Debris Volume (in^3)	Debris Vol/Catch Basin (m^3)
Asians	51604461111062	1.9(1)	7/9/2008	Debris-Light	3.304	1.101	1.652
			12/29/2008	Trash 3/4 Full		2.478	
			1/27/2009	Debris-Severe		3.304	
			4/6/2009	Trash 1/4 Full		0.826	
			5/5/2009	Trash 1/4 Full		0.826	
			10/15/2009	Dirt/Rock/Soil 1/4 Full		0.826	
			1/20/2010	Trash Full		3.304	
			11/22/2010	Debris-Light		1.101	
			5/9/2011	Debris-Light		1.101	
	51604461111255	1.9(2)	7/9/2008	Debris-Light	8.859	2.953	4.594
			12/29/2008	Trash 3/4 Full		6.644	
			1/27/2009	Debris-Severe		8.859	
			4/6/2009	Trash 1/2 Full		4.429	
			5/5/2009	Trash 1/4 Full		2.215	
			10/13/2009	Green Waste 1/4 Full		2.215	
			1/20/2010	Trash Full		8.859	
			12/20/2010	Trash 1/4 Full		2.215	
			11/22/2010	Debris-Light		2.953	
	49416461111143	1.9(3)	7/14/2008	Trash 1/2 Full	1.999	0.999	1.083

			10/1/2008	Trash 1/2 Full		0.999	
			1/22/2009	Debris-Moderate		1.333	
			3/12/2009	Debris-Moderate		1.333	
			4/29/2009	Dirt/Rock/Soil 1/4 Full		0.500	
			6/17/2009	Trash 1/4 Full		0.500	
			10/13/2009	Trash 1/4 Full		0.500	
			2/11/2010	Debris-Moderate		1.333	
			12/8/2010	Debris-Moderate		1.333	
			6/20/2011	Debris-Severe		1.999	
	4941646111073	1.9(4)	7/14/2008	Trash 1/2 Full	5.054	2.527	2.401
			10/1/2008	Trash 1/2 Full		2.527	
			1/21/2009	Debris-Moderate		3.369	
			3/11/2009	Trash 1/4 Full		1.263	
			4/30/2009	Debris-Light		1.685	
			6/17/2009	Dirt/Rock/Soil 1/4 Full		1.263	
			10/13/2009	Trash 1/4 Full		1.263	
			2/11/2010	Debris-Moderate		3.369	
			12/8/2010	Debris-Moderate		3.369	
			6/17/2011	Debris-Moderate		3.369	
	4941646111078	1.9(5)	7/14/2008	Debris-Light	4.596	1.532	2.170
			10/15/2008	Debris-Moderate		3.064	
			4/30/2009	Dirt/Rock/Soil 1/4 Full		1.149	
			6/17/2009	Trash 1/4 Full		1.149	
			10/13/2009	Debris-Moderate		3.064	
			12/8/2010	Debris-Moderate		3.064	
	5160446111053	1.9(6)	10/1/2008	Trash 1/2 Full	3.829	1.915	1.631
			1/21/2009	Trash 1/4 Full		0.957	
			3/11/2009	Trash 1/4 Full		0.957	
			4/30/2009	Debris-Light		1.276	
			6/17/2009	Dirt/Rock/Soil 1/4 Full		0.957	
			10/13/2009	Trash 1/4 Full		0.957	
			11/16/2009	Debris-Moderate		2.553	
			2/11/2010	Debris-Moderate		2.553	
			12/8/2010	Debris-Moderate		2.553	
	5160446111054	1.9(7)	7/9/2008	Debris-Light	1.312	0.437	0.547
			12/29/2008	Trash 1/2 Full		0.656	
			1/28/2009	Debris-Moderate		0.874	
			4/6/2009	Trash 1/4 Full		0.328	
			5/5/2009	Trash 1/4 Full		0.328	
			10/15/2009	Dirt/Rock/Soil 1/4 Full		0.328	

			1/20/2010	Trash Full		1.312	
			11/22/2010	Trash 1/4 Full		0.328	
			5/9/2011	Trash 1/4 Full		0.328	
	5160446111087	1.9(8)	7/9/2008	Debris-Light	3.785	1.262	1.718
			12/29/2008	Trash 1/2 Full		1.893	
			1/27/2009	Debris-Severe		3.785	
			4/6/2009	Trash 1/4 Full		0.946	
			5/5/2009	Trash 1/4 Full		0.946	
			10/15/2009	Dirt/Rock/Soil 1/4 Full		0.946	
			1/20/2010	Trash Full		3.785	
			11/22/2010	Trash 1/4 Full		0.946	
			5/9/2011	Trash 1/4 Full		0.946	
	5160446111054	Cleaning History Not Available					
	for all catch basins in site						1.974
Blacks	5160746111054	1.10(1)	7/7/2008	Trash 1/4 Full	2.419	0.605	1.008
			12/17/2008	Trash 1/2 Full		1.209	
			1/27/2009	Trash 1/2 Full		1.209	
			4/10/2009	Trash 1/2 Full		1.209	
			5/13/2009	Debris-Light		0.806	
	5160746111277	1.10(2)	7/7/2008	Trash 1/4 Full	0.912	0.228	0.338
			12/16/2008	Trash 1/2 Full		0.456	
			1/27/2009	Trash 1/2 Full		0.456	
			4/10/2009	Trash 1/2 Full		0.456	
			5/13/2009	Debris-Light		0.304	
			10/8/2009	Trash 1/2 Full		0.456	
			1/14/2010	Trash 1/4 Full		0.228	
			11/8/2010	Dirt/Rock/Soil 1/4 Full		0.228	
			5/20/2011	Trash 1/4 Full		0.228	
	5160746111222	1.10(3)	7/15/2008	Trash 1/4 Full	3.171	0.793	0.925
			12/16/2008	Trash 1/2 Full		1.586	
			5/6/2009	Trash 1/4 Full		0.793	
			10/5/2009	Trash 1/4 Full		0.793	
			1/11/2010	Trash 1/4 Full		0.793	
			11/8/2010	Trash 1/4 Full		0.793	
	51607461111107	1.10(4)	7/15/2008	Trash 1/4 Full	1.078	0.270	0.393
			12/19/2008	Debris-Light		0.359	

			2/3/2009	Debris-Moderate		0.719	
			4/10/2009	Trash 1/2 Full		0.539	
			5/18/2009	Debris-Light		0.359	
			10/5/2009	Debris-Light		0.359	
			1/12/2010	Trash 1/4 Full		0.270	
			11/15/2010	Trash 1/4 Full		0.270	
	51607461111131	1.10(5)	7/15/2008	Trash 1/4 Full	1.325	0.331	0.594
			12/19/2008	Debris-Light		0.331	
			2/3/2009	Debris-Moderate		0.883	
			4/9/2009	Trash 1/2 Full		0.662	
			5/18/2009	Debris-Light		0.442	
			10/9/2009	Debris-Light		0.442	
			1/12/2010	Trash 1/4 Full		0.331	
			11/8/2010	Dirt/Rock/Soil 3/4 Full		0.927	
			1/28/2011	Dirt/Rock/Soil 3/4 Full		0.994	
	51607461111235	1.10(6)	7/15/2008	Trash 1/4 Full	1.654	0.413	0.689
			12/16/2008	Trash 1/2 Full		0.827	
			5/6/2009	Trash 1/4 Full		0.413	
			10/21/2009	Trash 3/4 Full		1.240	
			1/12/2010	Trash 1/4 Full		0.413	
			11/8/2010	Trash 1/4 Full		0.413	
			5/16/2011	Debris-Moderate		1.103	
	51607461111258	1.10(7)	7/7/2008	Debris-Light	1.236	0.412	0.395
			12/16/2008	Trash 1/2 Full		0.618	
			5/6/2009	Trash 1/4 Full		0.309	
			10/9/2009	Debris-Light		0.412	
			1/15/2010	Trash 1/4 Full		0.309	
			11/8/2010	Trash 1/4 Full		0.309	
	51607461111287	1.10(8)	7/7/2008	Debris-Light	1.616	0.539	0.529
			12/16/2008	Trash 1/2 Full		0.808	
			1/29/2009	Trash 1/4 Full		0.404	
			4/10/2009	Trash 1/2 Full		0.808	
			5/13/2009	Debris-Light		0.180	
			10/8/2009	Trash 1/2 Full		0.808	
			1/14/2010	Trash 1/4 Full		0.404	
			11/8/2010	Dirt/Rock/Soil 1/4 Full		0.404	
			5/20/2011	Trash 1/4 Full		0.404	

	51607461111	Cleaning History Not Available					
	for all catch basins in site						0.609
Hispanics	4671146111099	1.11(1)	12/2/2008	Trash 1/4 Full	4.808	1.202	1.536
			2/17/2009	Trash 1/4 Full		1.202	
			5/12/2009	Debris-Moderate		3.205	
			6/23/2009	Trash 1/4 Full		1.202	
			11/24/2009	Dirt/Rock/Soil 1/4 Full		1.202	
			11/16/2010	Trash 1/4 Full		1.202	
	4671146111087	1.11(2)	11/25/2008	Trash 1/4 Full	1.521	0.380	0.486
			2/17/2009	Trash 1/4 Full		0.380	
			5/12/2009	Debris-Moderate		1.014	
			6/23/2009	Trash 1/4 Full		0.380	
			11/24/2009	Dirt/Rock/Soil 1/4 Full		0.380	
			11/16/2010	Trash 1/4 Full		0.380	
	4671146111076	1.11(3)	11/25/2008	Trash 1/4 Full	1.206	0.302	0.385
			2/17/2009	Trash 1/4 Full		0.302	
			5/12/2009	Debris-Moderate		0.804	
			6/23/2009	Trash 1/4 Full		0.302	
			11/24/2009	Dirt/Rock/Soil 1/4 Full		0.302	
			11/16/2010	Trash 1/4 Full		0.302	
	4671146111018	1.11(4)	11/25/2008	Trash 1/4 Full	0.895	0.224	0.286
			2/17/2009	Trash 1/4 Full		0.224	
			5/12/2009	Debris-Moderate		0.596	
			6/23/2009	Trash 1/4 Full		0.224	
			11/24/2009	Dirt/Rock/Soil 1/4 Full		0.224	
			11/18/2010	Trash 1/4 Full		0.224	
	4671246111045	1.11(5)	11/25/2008	Trash 1/4 Full	0.588	0.147	0.178
			2/17/2009	Trash 1/4 Full		0.147	
			5/5/2009	Trash 1/4 Full		0.147	
			6/25/2009	Trash 1/4 Full		0.147	
			7/16/2009	Trash 1/4 Full		0.147	
			11/24/2009	Green Waste 1/4 Full		0.147	
			11/19/2010	Dirt/Rock/Soil 1/4 Full		0.147	
			2/6/2011	Debris-Moderate		0.392	
	4671246 1111035	1.11(6)	11/25/2008	Trash 1/4 Full	1.266	0.317	0.383
			2/17/2009	Trash 1/4 Full		0.317	

			5/5/2009	Trash 1/4 Full		0.317	
			6/25/2009	Trash 1/4 Full		0.317	
			7/16/2009	Trash 1/4 Full		0.317	
			12/1/2009	Trash 1/4 Full		0.317	
			11/19/2010	Dirt/Rock/Soil 1/4 Full		0.317	
			2/6/2011	Debris-Moderate		0.844	
	46712461111029	1.11(7)	11/25/2008	Trash 1/4 Full	0.468	0.117	0.137
			1/7/2009	Trash 1/4 Full		0.117	
			2/18/2009	Trash 1/4 Full		0.117	
			4/2/2009	Trash 1/4 Full		0.117	
			5/5/2009	Trash 1/4 Full		0.117	
			6/25/2009	Trash 1/4 Full		0.117	
			7/16/2009	Trash 1/4 Full		0.117	
			12/1/2009	Trash 1/4 Full		0.117	
			11/19/2010	Trash 1/4 Full		0.117	
			2/6/2011	Debris-Moderate		0.312	
	46712461111021	1.11(8)	11/25/2008	Trash 1/4 Full	1.881	0.470	0.470
			2/18/2009	Trash 1/4 Full		0.470	
			5/5/2009	Trash 1/4 Full		0.470	
			6/25/2009	Trash 1/4 Full		0.470	
			7/16/2009	Trash 1/4 Full		0.470	
			12/1/2009	Trash 1/4 Full		0.470	
			11/19/2010	Trash 1/4 Full		0.470	
	46712461111001	1.11(9)	11/25/2008	Trash 1/4 Full	1.927	0.482	0.482
			2/15/2009	Trash 1/4 Full		0.482	
			5/5/2009	Trash 1/4 Full		0.482	
			6/25/2009	Trash 1/4 Full		0.482	
			7/16/2009	Trash 1/4 Full		0.482	
			12/1/2009	Trash 1/4 Full		0.482	
			11/19/2010	Trash 1/4 Full		0.482	
	46712461111012	1.11(10)	12/1/2008	Trash 1/4 Full	1.559	0.390	0.390
			2/18/2009	Trash 1/4 Full		0.390	
			5/5/2009	Trash 1/4 Full		0.390	
			7/1/2009	Trash 1/4 Full		0.390	
			7/16/2009	Trash 1/4 Full		0.390	
			12/4/2009	Green Waste 1/4 Full		0.390	
			11/19/2010	Trash 1/4 Full		0.390	
	46712461111024	1.11(11)	12/1/2008	Trash 1/4 Full	1.597	0.399	0.399
			2/18/2009	Trash 1/4 Full		0.399	
			5/5/2009	Trash 1/4 Full		0.399	

			6/29/2009	Trash 1/4 Full		0.399	
			7/16/2009	Trash 1/4 Full		0.399	
			12/1/2009	Trash 1/4 Full		0.399	
			11/18/2010	Trash 1/4 Full		0.399	
	4671246111033	1.11(12)	12/1/2008	Debris-Light	2.081	0.694	0.624
			1/7/2009	Trash 1/4 Full		0.520	
			2/17/2009	Trash 1/4 Full		0.520	
			4/2/2009	Trash 1/4 Full		0.520	
			5/5/2009	Trash 1/4 Full		0.520	
			6/29/2009	Trash 1/4 Full		0.520	
			7/16/2009	Trash 1/4 Full		0.520	
			12/1/2009	Trash 1/4 Full		0.520	
			11/29/2010	Trash 1/4 Full		0.520	
			2/6/2011	Debris-Moderate		1.387	
	4671246111063	1.11(13)	11/24/2008	Trash 1/4 Full	1.616	0.404	0.516
			2/17/2009	Trash 1/4 Full		0.404	
			5/12/2009	Debris-Moderate		1.077	
			6/23/2009	Trash 1/4 Full		0.404	
			12/1/2009	Trash 1/4 Full		0.404	
			11/16/2010	Trash 1/4 Full		0.404	
	4671246111079	1.11(14)	12/2/2008	Trash 1/4 Full	1.881	0.470	0.601
			2/17/2009	Trash 1/4 Full		0.470	
			5/12/2009	Debris-Moderate		1.254	
			6/23/2009	Trash 1/4 Full		0.470	
			11/24/2009	Dirt/Rock/Soil 1/4 Full		0.470	
			11/16/2010	Trash 1/4 Full		0.470	
	4671246111096	1.11(15)	12/2/2008	Trash 1/4 Full	2.488	0.622	0.795
			2/17/2009	Trash 1/4 Full		0.622	
			5/12/2009	Debris-Moderate		1.658	
			6/23/2009	Trash 1/4 Full		0.622	
			11/24/2009	Green Waste 1/4 Full		0.622	
			11/16/2010	Trash 1/4 Full		0.622	
	4671146111101	1.11(16)	12/2/2008	Trash 1/4 Full	0.779	0.195	0.249
			2/17/2009	Trash 1/4 Full		0.195	
			5/12/2009	Debris-Moderate		0.520	
			6/24/2009	Trash 1/4 Full		0.195	
			11/24/2009	Dirt/Rock/Soil 1/4 Full		0.195	
			11/16/2010	Trash 1/4 Full		0.195	
	4671146 1111108	1.11(17)	12/2/2008	Trash 1/4 Full	2.488	0.622	0.795
			2/17/2009	Trash 1/4 Full		0.622	

			5/12/2009	Debris-Moderate		1.658	
			6/24/2009	Trash 1/4 Full		0.622	
			11/24/2009	Dirt/Rock/Soil 1/4 Full		0.622	
			11/16/2010	Trash 1/4 Full		0.622	
	461246111036	Cleaning History Not Available					
	for all catch basins in site						0.512
Whites	441084611111001	1.12(1)	9/23/2008	Trash 1/4 Full	0.676	0.169	0.216
			2/25/2009	Debris-Light		0.225	
			6/8/2009	Trash 1/4 Full		0.169	
			7/13/2009	Green Waste 1/4 Full		0.169	
			11/30/2009	Debris-Light		0.225	
			2/3/2011	Green Waste 1/2 Full		0.338	
	441084611111002	1.12(2)	9/23/2008	Trash 1/4 Full	0.958	0.240	0.306
			2/25/2009	Debris-Light		0.319	
			6/8/2009	Trash 1/4 Full		0.240	
			7/13/2009	Green Waste 1/4 Full		0.240	
			11/30/2009	Debris-Light		0.319	
			2/3/2011	Green Waste 1/2 Full		0.479	
	442054611111015	1.12(3)	7/24/2008	Debris-Light	8.976	2.992	3.633
			3/2/2009	Debris-Light		2.992	
			6/8/2009	Debris-Light		2.992	
			7/23/2009	Debris-Light		2.992	
			12/8/2009	Debris-Light		2.992	
			7/9/2010	Debris-Moderate		5.984	
			2/10/2011	Green Waste 1/2 Full		4.488	
	442054611111030	1.12(4)	7/24/2008	Debris-Light	4.431	1.477	1.794
			3/2/2009	Debris-Light		1.477	
			6/8/2009	Debris-Light		1.477	
			7/23/2009	Debris-Light		1.477	
			12/8/2009	Debris-Light		1.477	
			7/9/2010	Debris-Moderate		2.954	
			2/10/2011	Green Waste 1/2 Full		2.216	

	44108461111007	Cleaning History Not Available
	for all catch basins in site	1.487

TABLE 1.2: ANOVA ANALYSIS

INCOME						
Groups	*Count*	*Sum*		*Variance*		
Low Income CBV (m^3)	4	2.919331	0.729833	0.47557		
Medium Income CBV (m^3)	10	11.7908	1.17908	1.332421		
High Income CBV (m^3)	6	5.991038	0.998506	0.214799		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.588089	2	0.294044	0.34492	0.71312	3.591531
Within Groups	14.49249	17	0.852499			
Total	15.08058	19				

POPULATION DENSITY						
Groups	*Count*	*Sum*		*Variance*		
Low PD	6	5.984258	0.997376	0		
Med PD	5	2.531126	0.506225	0.09319		
High PD	8	9.803354	1.225419	2.441474		
ANOVA						
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	1.601192027	2	0.800596	0.733521	0.495684	3.633723
Within Groups	17.46307548	16	1.091442			
Total	19.06426751	18				

ETHNICITY					
Groups	*Count*	*Sum*		*Variance*	
Hispanic	17	8.500855	0.50005	0.104355	
White	4	5.948959	1.48724	2.569955	
Black	8	4.870077	0.60876	0.062555	
Asian	8	15.79364	1.974205	1.457355	
ANOVA					
Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*
Between Groups	13.91972	3	4.639907	7.648615	0.000515
Within Groups	20.01891	33	0.606634		
Total	33.93863	36			

TABLE 1.3 SORTING CATEGORIES FOR COMPOSITION ANALYSIS **SEE PAGE 8**

TABLE 1.4: T-TEST FOR ETHNICITY SITES

	Asians	*Blacks*
Mean	1.974204556	0.608759658
Variance	1.457355333	0.06255511
Observations	8	8
Hypothesized Mean Difference	0	
df	8	
t Stat	3.132637719	
P(T<=t) one-tail	0.006979777	
t Critical one-tail	1.859548038	
P(T<=t) two-tail	0.013959554	
t Critical two-tail	2.306004135	

SIGNIFICANT

	Asians	*Hispanics*
Mean	1.974204556	0.500050267
Variance	1.457355333	0.104354595
Observations	8	17
Hypothesized Mean Difference	0	
df	7	
t Stat	3.397102449	
P(T<=t) one-tail	0.005743863	
t Critical one-tail	1.894578605	
P(T<=t) two-tail	0.011487725	
t Critical two-tail	2.364624252	

SIGNIFICANT

	Asians	*Whites*
Mean	1.974204556	1.487239857
Variance	1.457355333	2.569954609
Observations	8	4
Hypothesized Mean Difference	0	
df	5	
t Stat	0.536241625	
P(T<=t) one-tail	0.307389983	
t Critical one-tail	2.015048373	
P(T<=t) two-tail	0.614779966	
t Critical two-tail	2.570581836	

NOT SIGNIFICANT

	Blacks	*Hispanics*
Mean	0.608759658	0.500050267

Variance	0.06255511	0.104354595
Observations	8	17
Hypothesized Mean Difference	0	
df	18	
t Stat	0.920146775	
P(T<=t) one-tail	0.184831928	
t Critical one-tail	1.734063607	
P(T<=t) two-tail	0.369663856	
t Critical two-tail	2.10092204	

NOT SIGNIFICANT

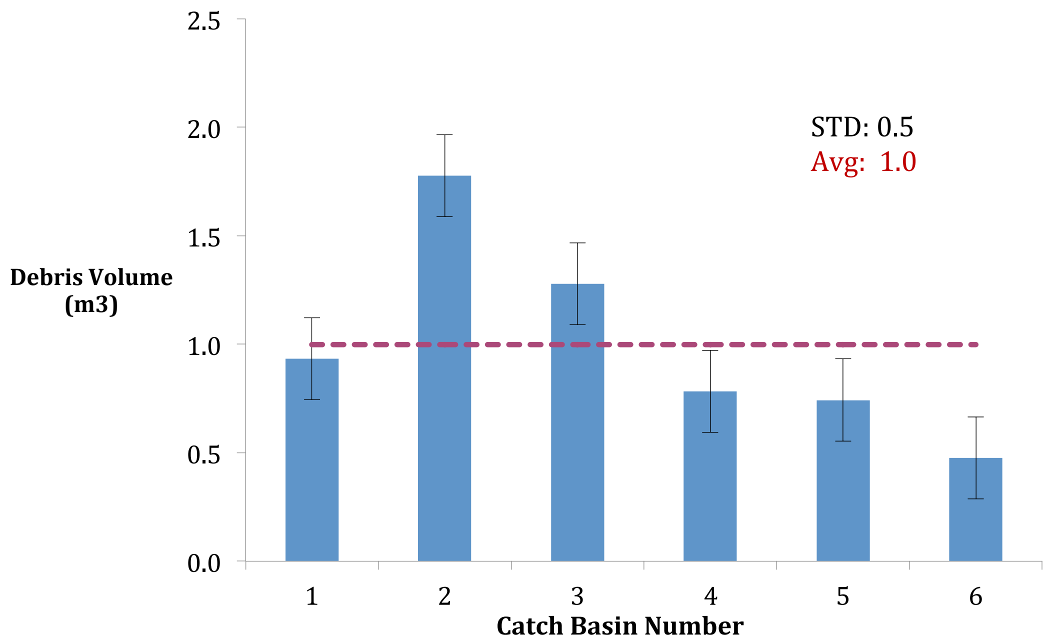
	Blacks	*Whites*
Mean	0.608759658	1.487239857
Variance	0.06255511	2.569954609
Observations	8	4
Hypothesized Mean Difference	0	
df	3	
t Stat	-1.089362484	
P(T<=t) one-tail	0.177838014	
t Critical one-tail	2.353363435	
P(T<=t) two-tail	0.355676027	
t Critical two-tail	3.182446305	

NOT SIGNIFICANT

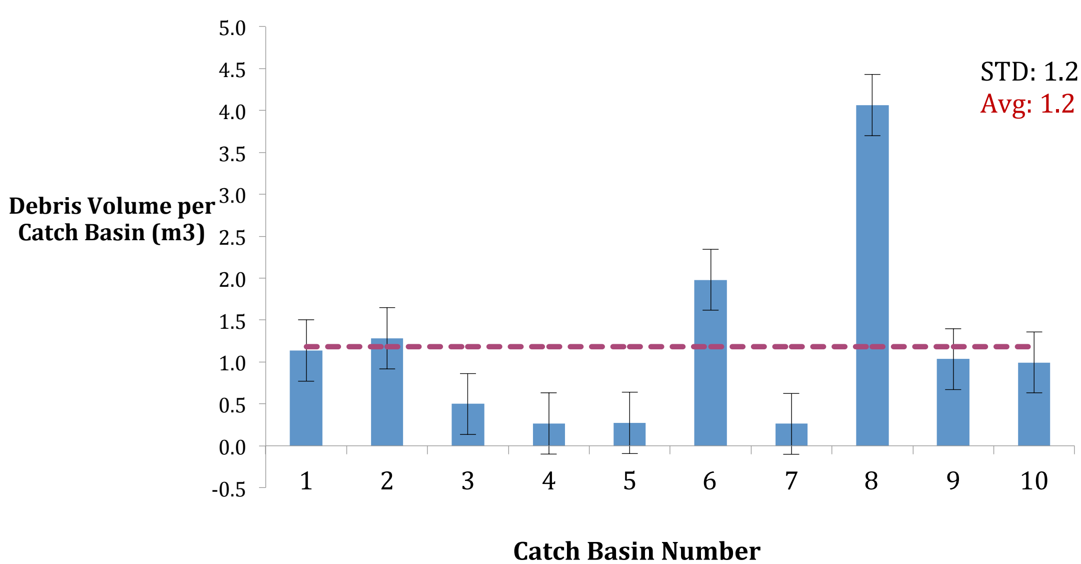
	Hispanics	*Whites*
Mean	0.500050267	1.487239857
Variance	0.104354595	2.569954609
Observations	17	4
Hypothesized Mean Difference	0	
df	3	
t Stat	-1.225753107	
P(T<=t) one-tail	0.153869393	
t Critical one-tail	2.353363435	
P(T<=t) two-tail	0.307738786	
t Critical two-tail	3.182446305	

NOT SIGNIFICANT

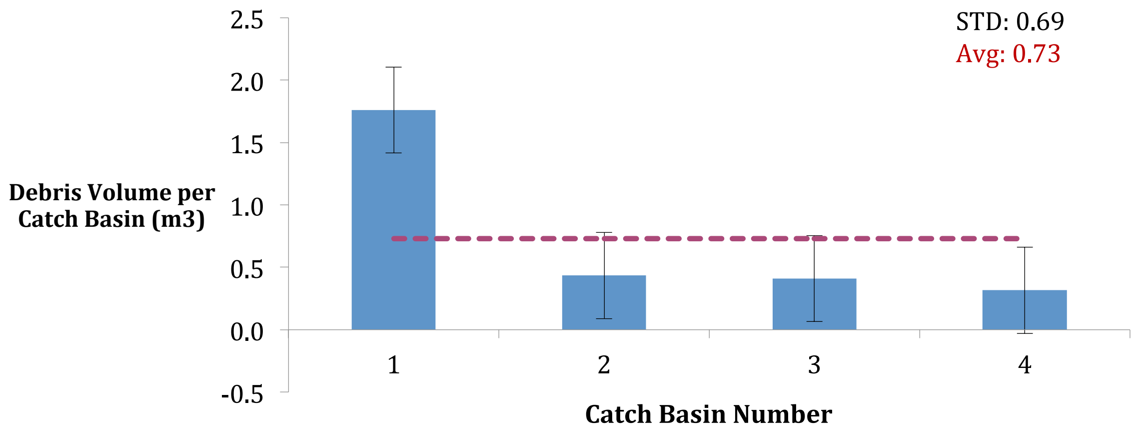
GRAPH 1.1: DEBRIS VOLUME PER CATCH BASIN IN HIGH INCOME AREA (2008-2011)



GRAPH 1.2: DEBRIS VOLUME PER CATCH BASIN IN MEDIUM INCOME AREA (2008-2011)

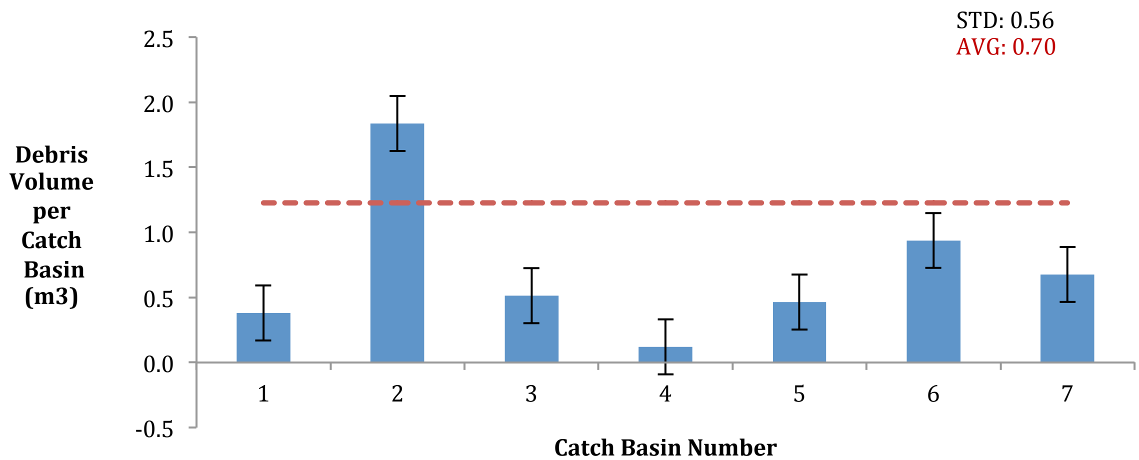


GRAPH 1.3: DEBRIS VOLUME PER CATCH BASIN IN LOW INCOME AREA (2008-2011)

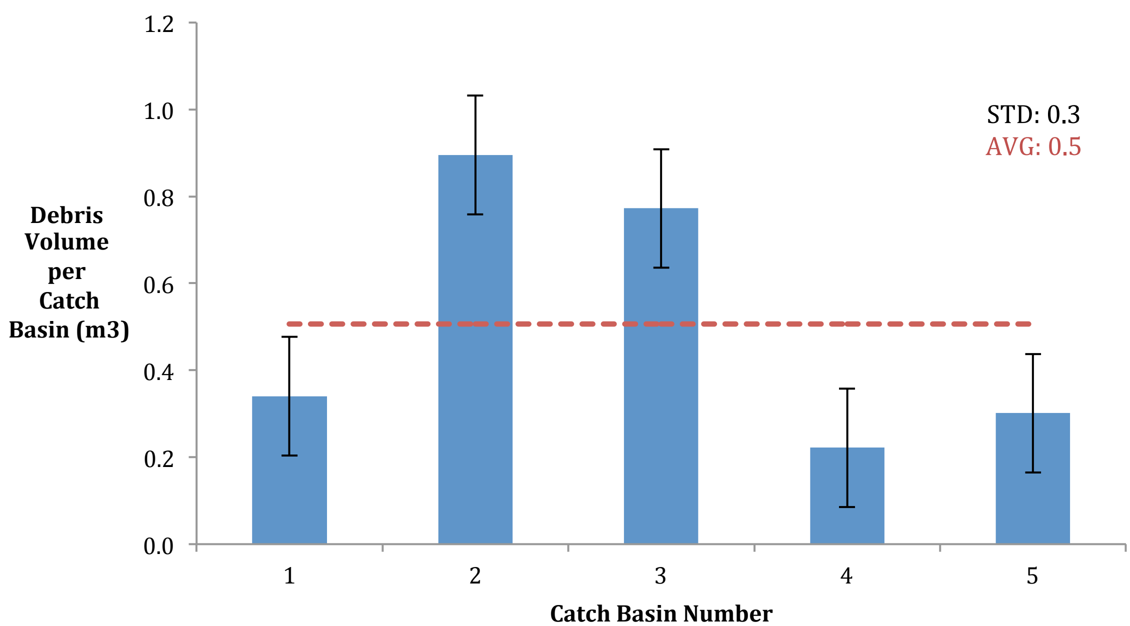


GRAPH 1.4: DEBRIS VOLUME PER CATCH BASIN IN ALL INCOME AREA (2008-2011) SEE PAGE 9

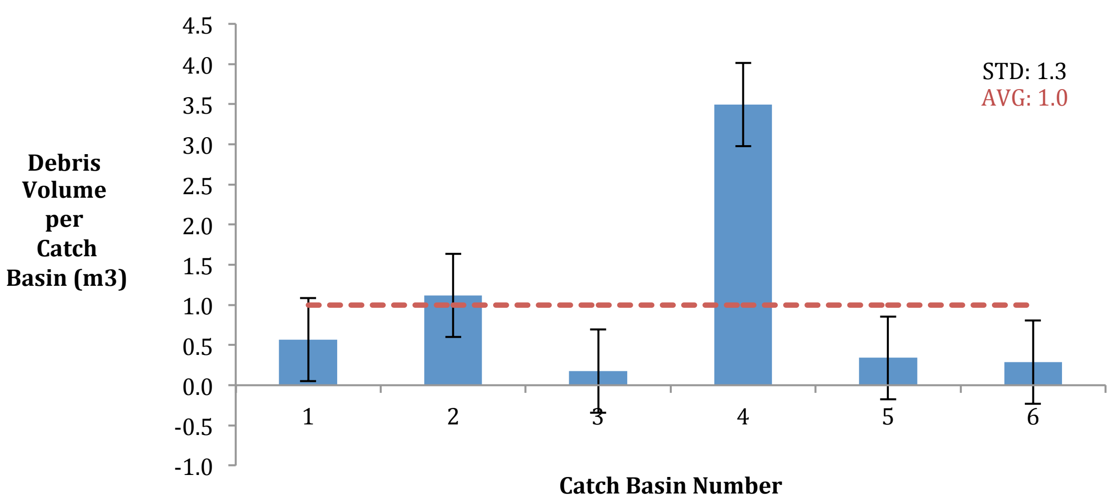
GRAPH 1.5: DEBRIS VOLUME PER CATCH BASIN IN HIGH POPULATION DENSITY AREA (2008-2011)



GRAPH 1.6: DEBRIS VOLUME PER CATCH BASIN IN MEDIUM POPULATION DENSITY AREA (2008-2011)

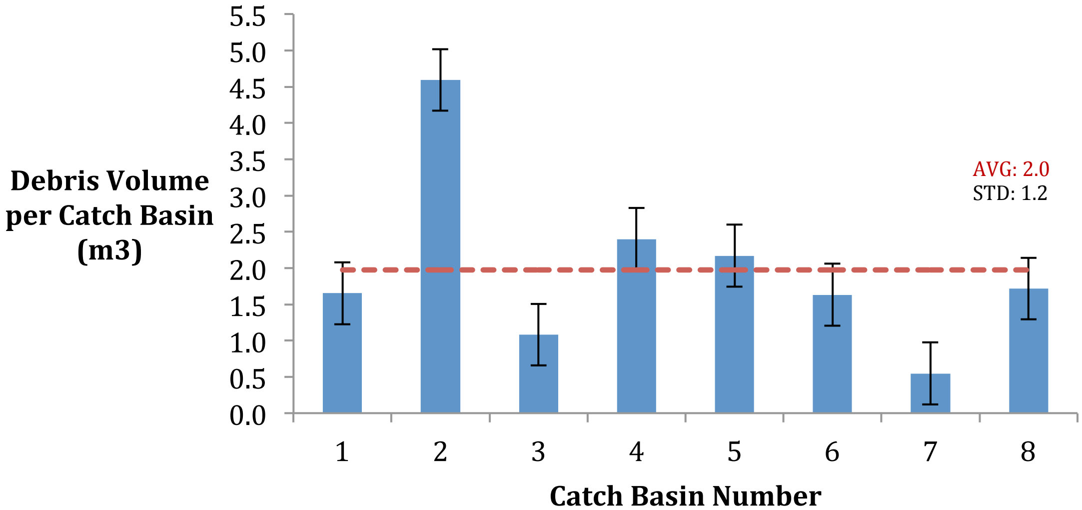


GRAPH 1.7: DEBRIS VOLUME PER CATCH BASIN IN LOW POPULATION DENSITY AREA (2008-2011)

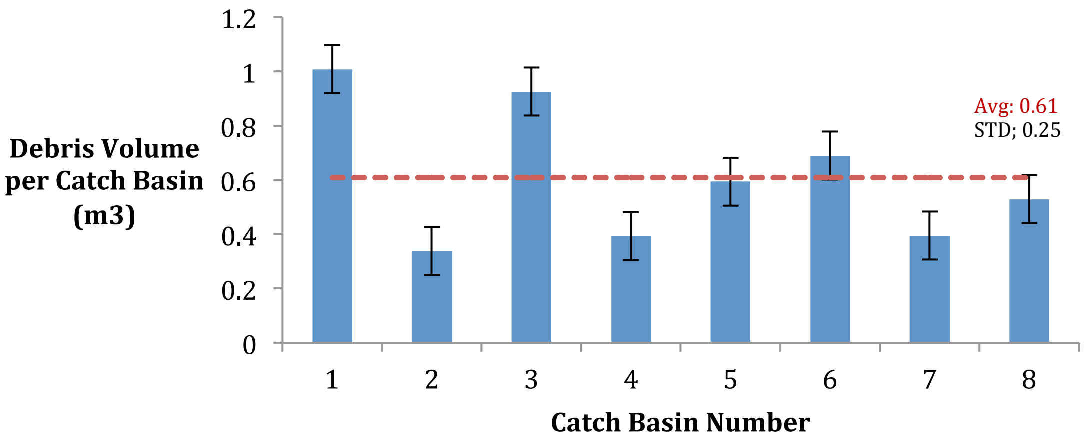


GRAPH 1.8: DEBRIS VOLUME PER CATCH BASIN IN ALL POPULATION DENSITY AREA (2008-2011) SEE PAGE 9

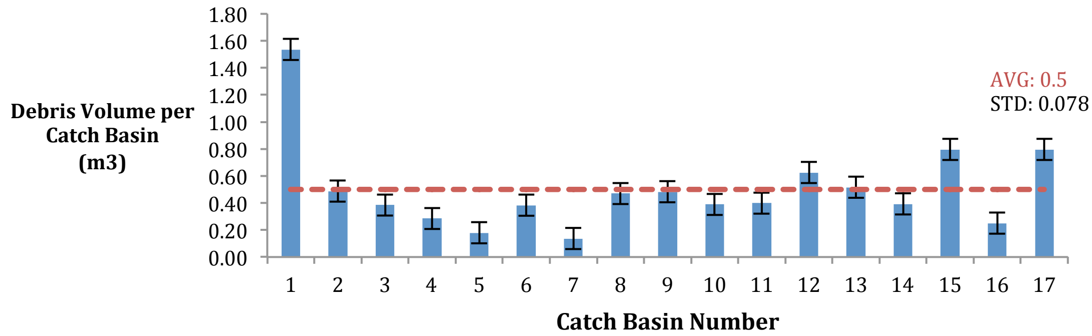
GRAPH 1.9: DEBRIS VOLUME PER CATCH BASIN IN ASIANS POPULATION STUDY SITE (2008-2011)



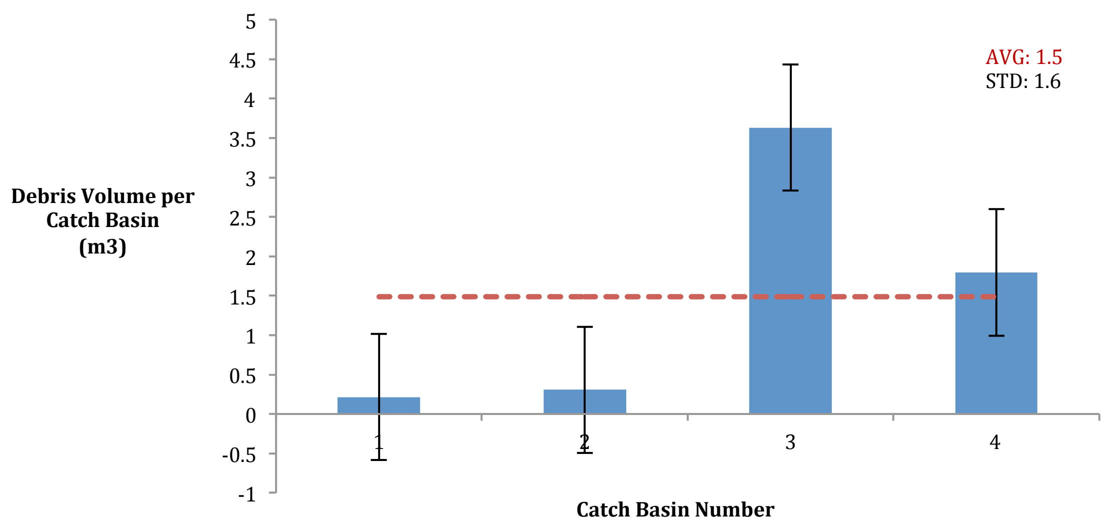
GRAPH 1.10: DEBRIS VOLUME PER CATCH BASIN IN BLACKS POPULATION STUDY SITE (2008-2011)



GRAPH 1.11: DEBRIS VOLUME PER CATCH BASIN IN HISPANICS POPULATION STUDY SITE (2008-2011)

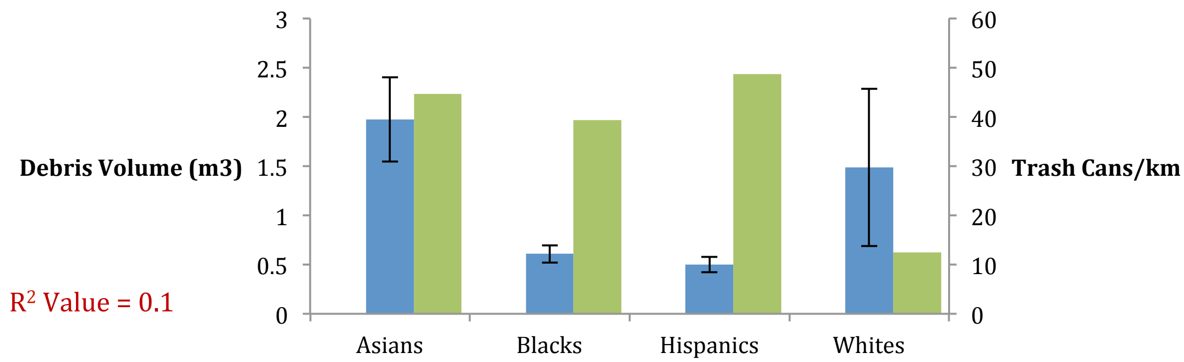


GRAPH 1.12: DEBRIS VOLUME PER CATCH BASIN IN WHITES POPULATION STUDY SITE (2008-2011)

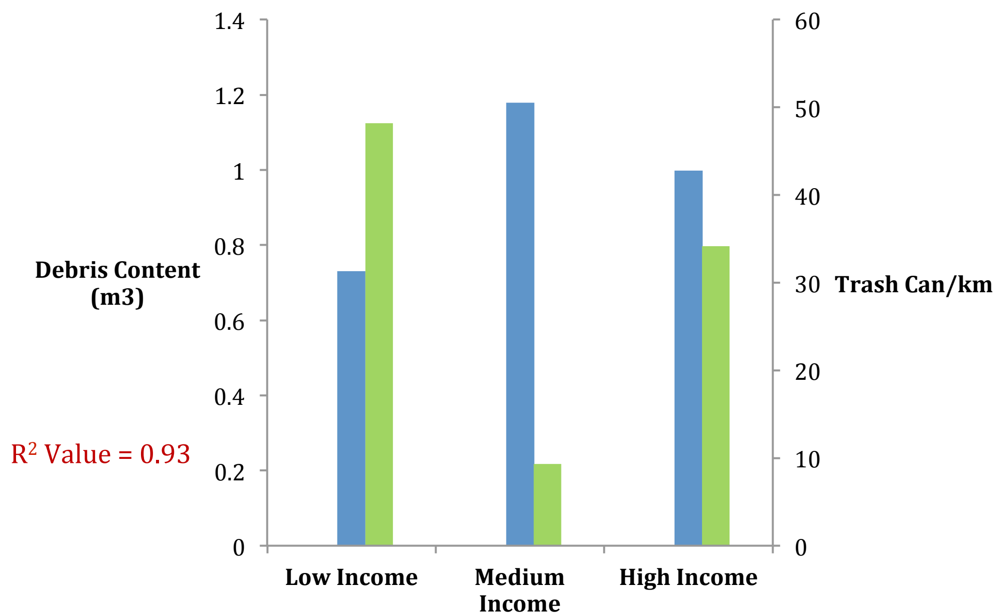


GRAPH 1.13: DEBRIS VOLUME PER CATCH BASIN IN ALL ETHNICITY AREA (2008-2011) SEE PAGE 9

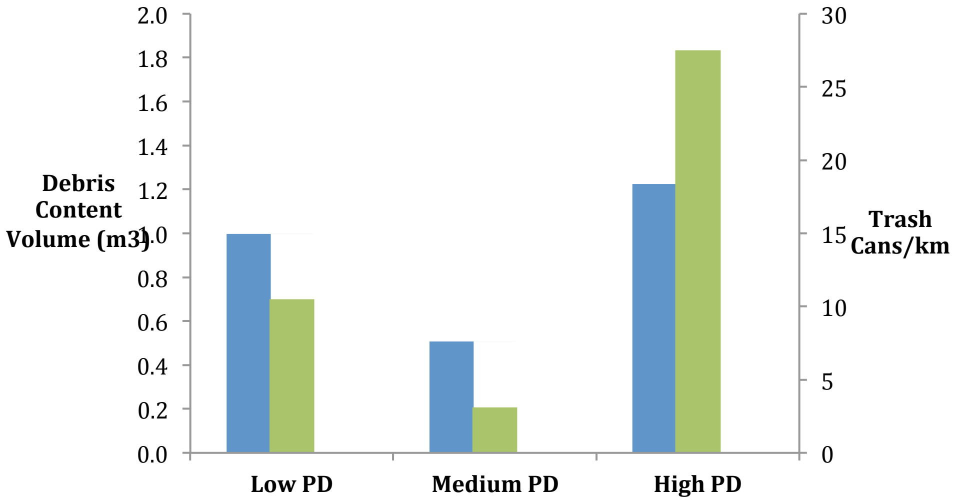
GRAPH 1.14: CATCH BASIN DEBRIS VOLUME AND NUMBER OF TRASH CAN PER KILOMETER IN ALL ETHNICITY AREAS (2008-2011)



GRAPH 1.15: CATCH BASIN DEBRIS VOLUME AND NUMBER OF TRASH CANS PER KILOMETER IN ALL INCOME AREAS (2008-2011)



GRAPH 1.16: CATCH BASIN DEBRIS VOLUME AND NUMBER OF TRASH CANS PER KILOMETERS IN ALL POPULATION DENSITY AREAS (2008-2011)



R^2 Value = 0.83

GRAPH 1.17: CORRELATION BETWEEN DEBRIS VOLUME PER CATCH BASIN AND TRASH CANS AMOUNT SEE PAGE 10-11

APPENDIX II

TABLE 2.1: COMPOSITION WEIGHT OF ALL SITES

Weight by Trash Category (g)	Plastic				Styrofoam		
Variable	Single Use Bag	Wrappers	Food/Liquid Container	Miscellaneous Plastic	Variable	Food/Liquid Containers	Miscellaneous Styrofoam
High Income	4.00	1.31	4.00	11.00	High Income	0.00	0.00
Medium Income	0.00	0.06	13.26	36.00	Medium Income	0.00	0.02
Low Income	59.00	16.97	35.00	63.43	Low Income	6.00	0.31
High PD	148.00	107.00	81.09	112.72	High PD	0.00	31.00
Medium PD	0.00	10.00	19.05	31.85	Medium PD	10.17	9.08
Low PD	0.00	7.14	28.00	21.43	Low PD	0.00	0.33
Asians	0.85	4.78	4.79	20.96	Asians	0.00	3.04
Blacks	0.00	5.46	5.00	31.81	Blacks	0.00	0.02
Hispanics	1.83	8.97	0.00	2.51	Hispanics	0.00	2.48
Whites	2.91	3.74	77.00	13.56	Whites	5.02	0.00
Total Weight by Variable	216.59	165.44	267.18	345.28		21.19	46.28
Total	994.49				67.47		
Total Percent w/Organic	1.49%				0.10%		
Total Percent w/o Organic	41.32%				2.80%		

Variable	Variable	Cloth	Variable	Cigarette Butts	Newspapers	Food/Liquid Containers	Cardboard	Miscellaneous Paper
High Income	High Income	6.59	High Income	1.70	0.00	0.00	0.00	94.22
Medium Income	Medium Income	0.00	Medium Income	2.76	0.00	0.00	0.00	64.36

Low Income	Low Income	100.00	Low Income	84.03	0.00	0.00	0.00	43.65
High PD	High PD	29.00	High PD	13.97	59.00	0.00	0.00	97.00
Medium PD	Medium PD	0.00	Medium PD	7.31	19.00	0.00	9.00	69.03
Low PD	Low PD	0.00	Low PD	16.03	1.00	16.00	0.00	46.65
Asians	Asians	0.04	Asians	22.99	0.00	0.00	1.54	69.47
Blacks	Blacks	6.25	Blacks	79.96	7.98	2.38	0.00	31.57
Hispanics	Hispanics	0.03	Hispanics	6.30	0.00	0.00	0.00	32.92
Whites	Whites	4.31	Whites	10.79	11.90	19.74	9.05	62.20
Total Weight by Variable	146.23			245.83	98.88	38.13	19.59	611.06
Total	146.23		1013.50					
Total Percent w/Organic	0.22%		1.52%					
Total Percent w/o Organic	6.07%		42.11%					

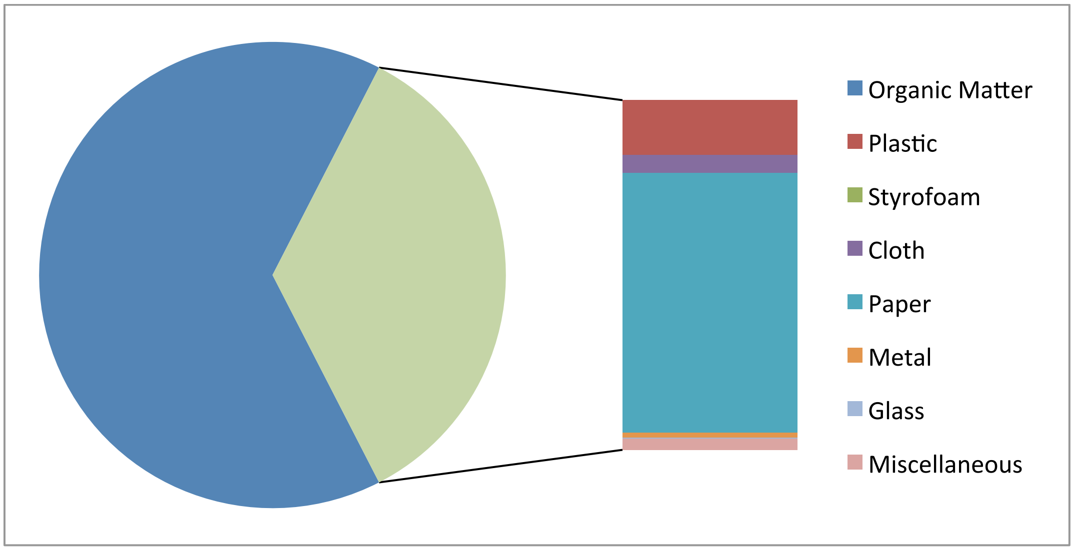
Weight by Trash Category (g)	Metal			Glass			Miscellaneous	Organic Matter	Total Weight	
Variable	Variable	Jewelry	Miscellaneous Metal	Variable	Glass	Variable	Miscellaneous	Organic Matter		Total Weight w/o Organic Matter
High Income	High Income	0.00	1.89	High Income	0.40	High Income	4.10	241.00	370.21	129.21
Medium Income	Medium Income	0.00	3.21	Medium Income	0.00	Medium Income	5.79	14861.65	14987.11	125.46
Low Income	Low Income	14.00	36.31	Low Income	3.00	Low Income	0.00	3123.17	3584.86	461.69
High PD	High PD	0.00	18.07	High PD	1.21	High PD	3.60	23308.16	24009.81	701.65
Medium PD	Medium PD	0.00	11.46	Medium PD	0.88	Medium PD	2.19	17356.42	17555.44	199.02
Low PD	Low PD	0.00	10.31	Low PD	12.00	Low PD	7.00	4257.16	4423.04	165.88
Asians	Asians	0.00	12.35	Asians	0.00	Asians	0.47	256.00	397.28	141.28
Blacks	Blacks	0.00	11.67	Blacks	6.65	Blacks	3.55	255.00	447.31	192.31

Hispanics	Hispanics	10.00	0.23	Hispanics	0.00	Hispanics	0.00	451.15	516.43	65.28
Whites	Whites	0.00	4.58	Whites	0.46	Whites	0.00	219.00	444.28	225.28
Total Weight by Variable		24.00	110.09		24.60		26.69	64328.70	66735.77	2407.07
Total	134.09			24.60			26.69	64328.70	66735.77	2407.07
Total Percent w/Organic	0.20%			0.04%		0.04%		96.39%		
Total Percent w/o Organic	5.57%			1.02%		1.11%				

GRAPH 2.1: ALL SITES COMPOSITION BREAKDOWN (WITH ORGANIC MATTER) **SEE PAGE 13**

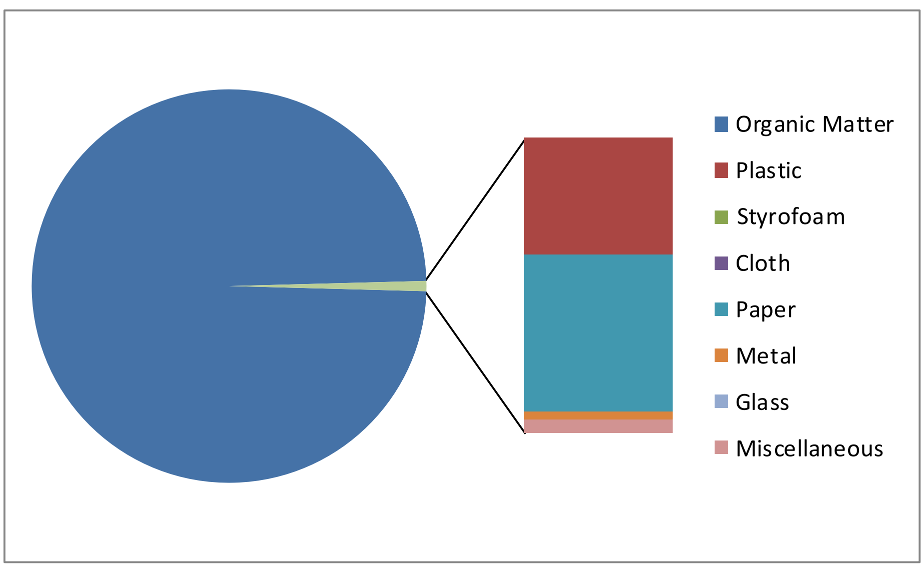
GRAPH 2.2 ALL SITES COMPOSITION BREAKDOWN (WITHOUT ORGANIC MATTER) **SEE PAGE 14**

GRAPH 2.3: HIGH INCOME CATCH BASIN COMPOSITION



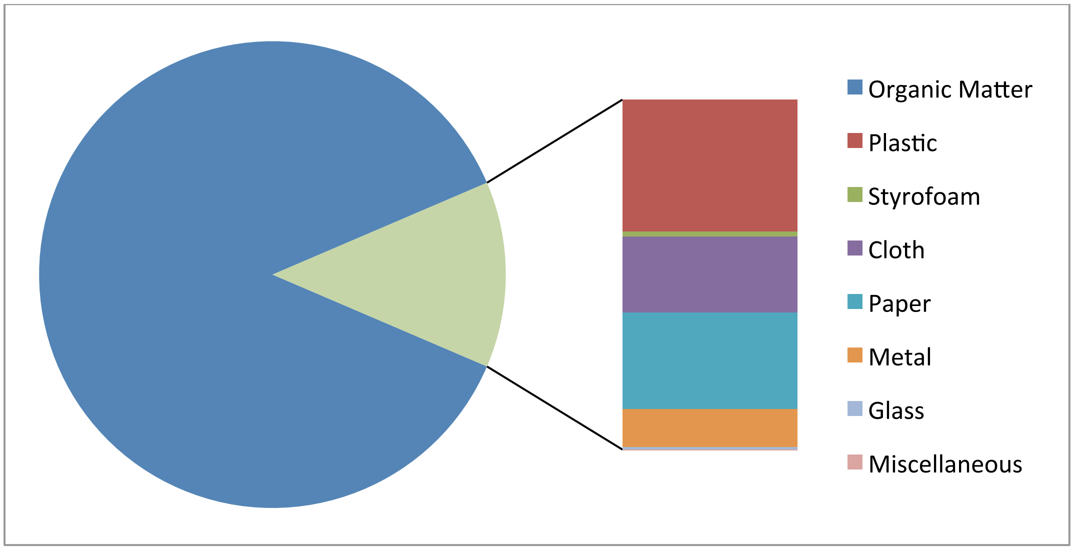
High Income	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	65.1%	5.49%	0.00%	1.78%	25.9%	0.51%	0.11%	1.11%

GRAPH 2.4: MEDIUM INCOME CATCH BASIN COMPOSITION



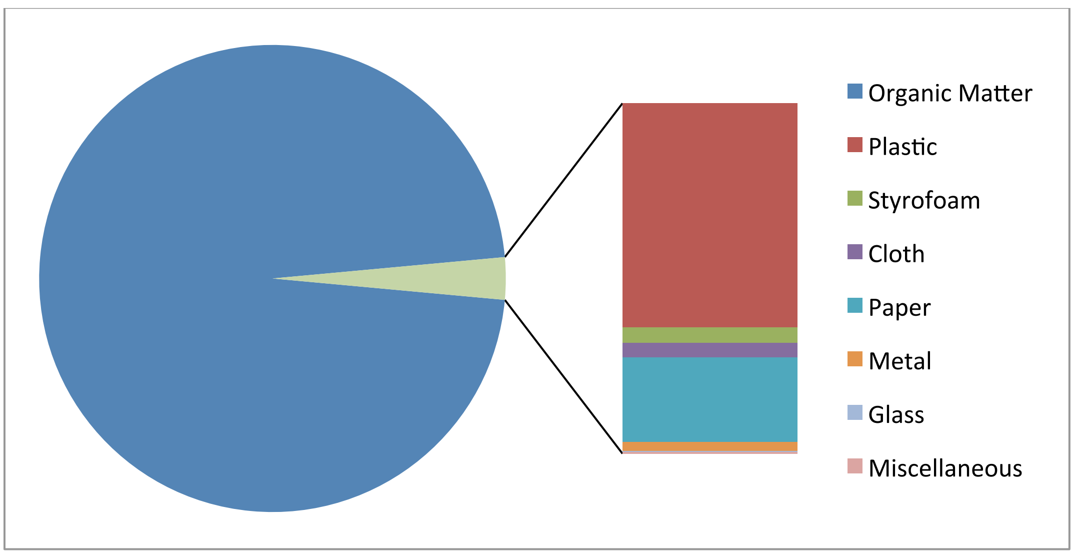
Medium Income	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	99.2%	0.33%	0.00%	0.00%	0.45%	0.02%	0.00%	0.04%

GRAPH 2.5: LOW INCOME CATCH BASIN COMPOSITION



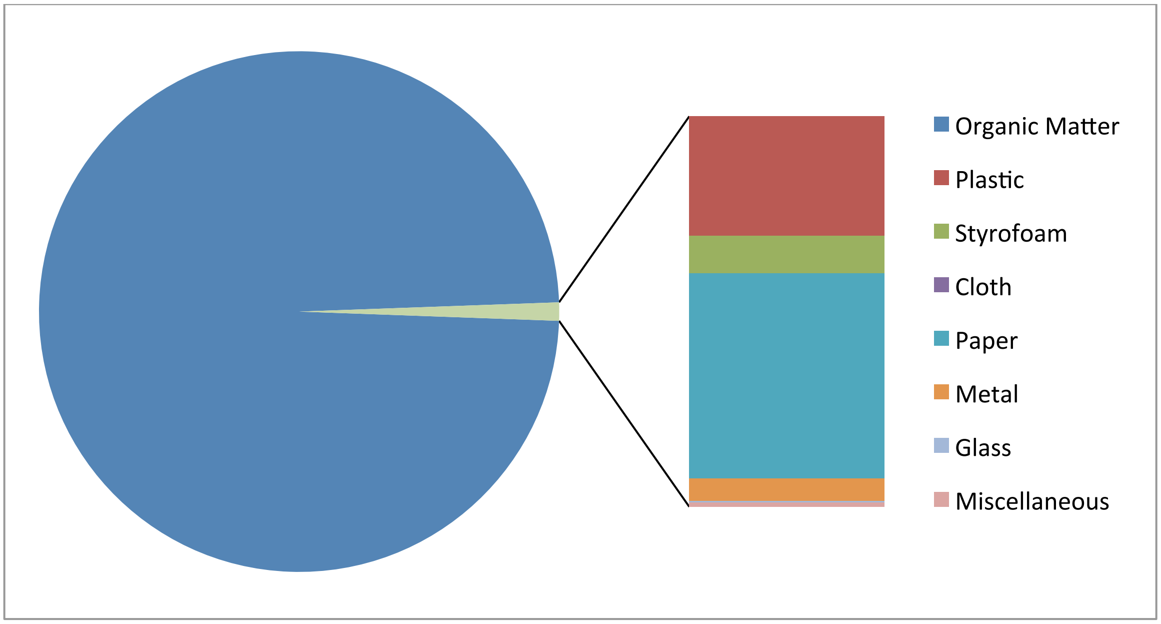
Low Income	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	87.1%	4.86%	0.18%	2.79%	3.56%	1.40%	0.08%	0.00%

GRAPH 2.6: HIGH POPULATION DENSITY CATCH BASIN COMPOSITION



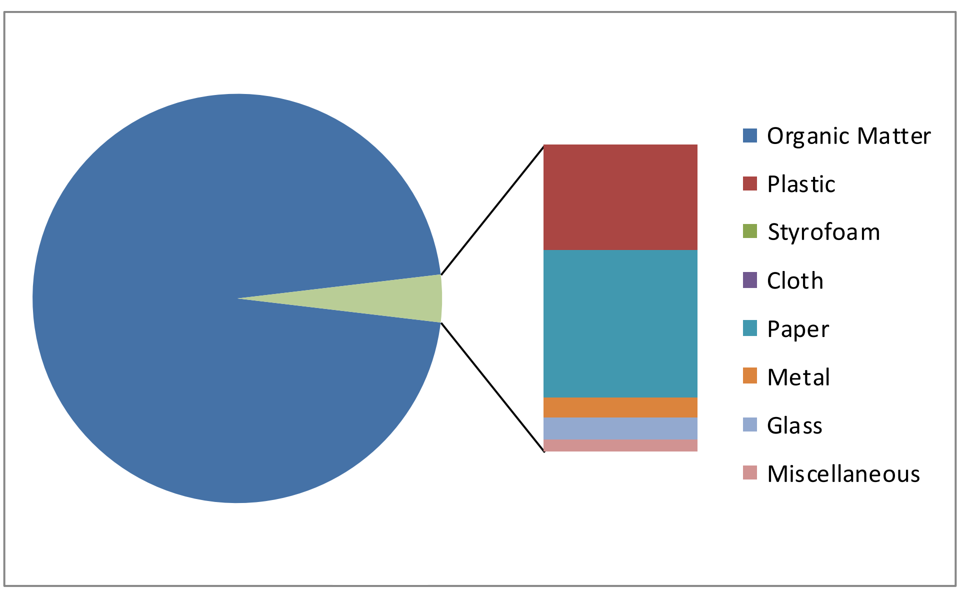
High PD	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	97.1%	1.87%	0.13%	0.12%	0.71%	0.08%	0.01%	0.01%

GRAPH 2.7: MEDIUM POPULATION DENSITY CATCH BASIN COMPOSITION



Medium PD	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	98.9%	0.35%	0.11%	0.00%	0.59%	0.07%	0.01%	0.01%

GRAPH 2.8: LOW POPULATION DENSITY CATCH BASIN COMPOSITION



Low PD	*Organic Matter*	*Plastic*	*Styrofoam*	*Cloth*	*Paper*	*Metal*	*Glass*	*Miscellaneous*
% by Weight	96.3%	1.28%	0.01%	0.00%	1.80%	0.23%	0.27%	0.16%

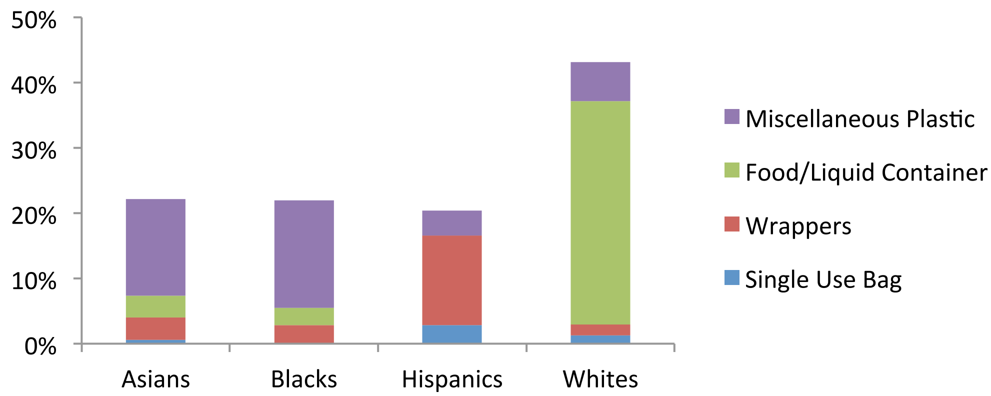
GRAPH 2.9: HISPANIC ETHNICITY CATCH BASIN COMPOSITION SEE PAGE 11

GRAPH 2.10: ASIAN ETHNICITY CATCH BASIN COMPOSITION SEE PAGE 12

GRAPH 2.11: BLACK ETHNICITY CATCH BASIN COMPOSITION SEE PAGE 12

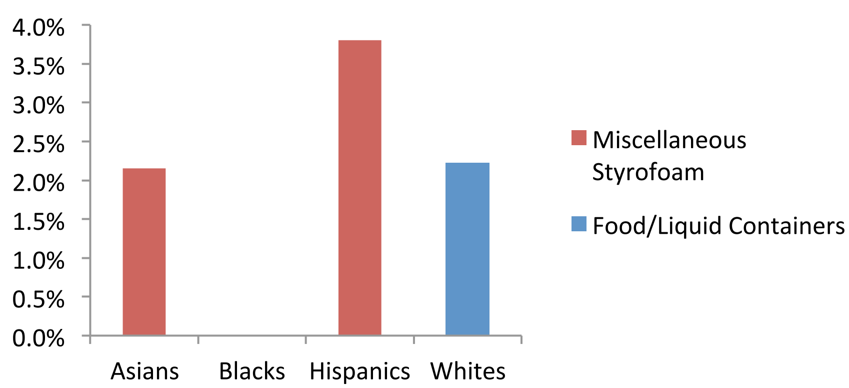
GRAPH 2.12: WHITE ETHNICITY CATCH BASIN COMPOSITION SEE PAGE 13

GRAPH 2.13: PLASTIC BY ETHNICITY



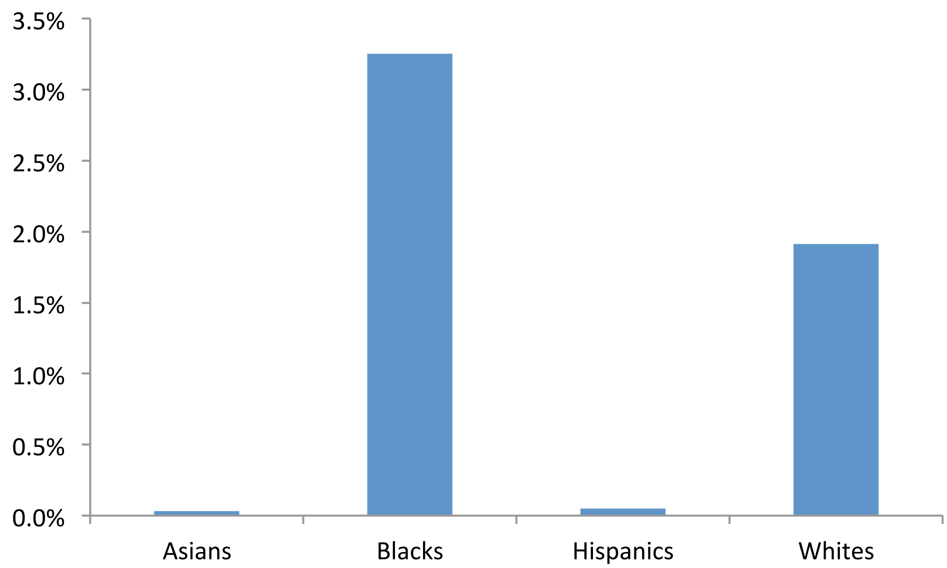
	Single Use Bag	Wrappers	Food/Liquid Container	Miscellaneous Plastic
Asians	0.60%	3.38%	3.39%	14.8%
Blacks	0.00%	2.84%	2.60%	16.54%
Hispanics	2.81%	13.8%	0.00%	3.85%
Whites	1.29%	1.66%	34.2%	6.02%

GRAPH 2.14: STYROFOAM BY ETHNICITY



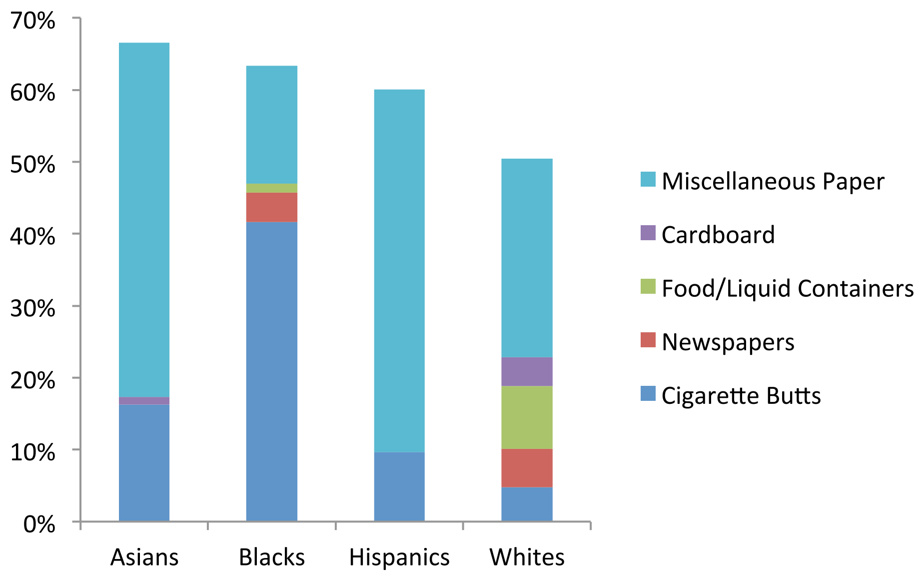
Variable	Food/Liquid Containers	Miscellaneous Styrofoam
Asians	0.00%	2.15%
Blacks	0.00%	0.01%
Hispanics	0.00%	3.81%
Whites	2.23%	0.00%

GRAPH 2.15: CLOTH BY ETHNICITY



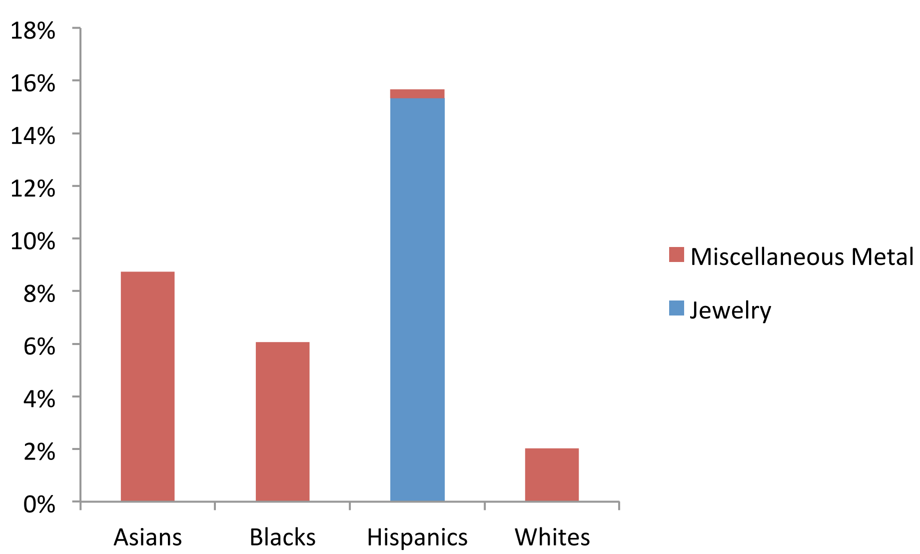
Variable	Cloth
Asians	0.03%
Blacks	3.25%
Hispanics	0.05%
Whites	1.91%

GRAPH 2.16: PAPER BY ETHNICITY

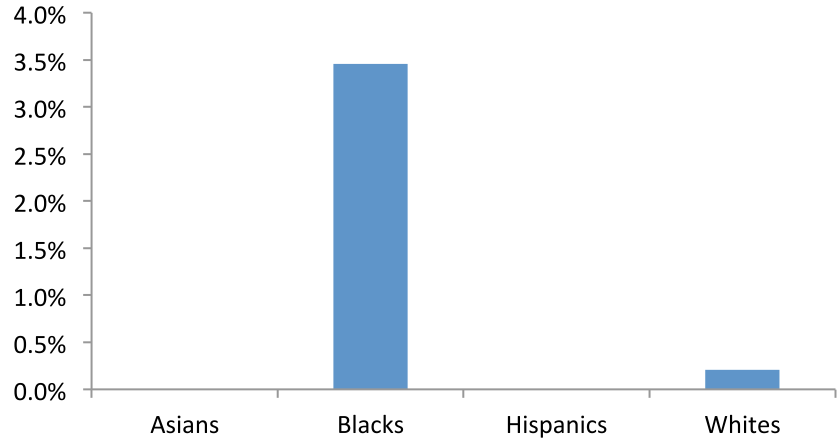


Variable	Cigarette Butts	Newspapers	Food/Liquid Containers	Cardboard	Miscellaneous Paper
Asians	16.3%	0.00%	0.00%	1.09%	49.2%
Blacks	41.6%	4.15%	1.24%	0.00%	16.4%
Hispanics	9.65%	0.00%	0.00%	0.00%	50.4%
Whites	4.79%	5.28%	8.76%	4.02%	27.6%

GRAPH 2.17: METAL BY ETHNICITY

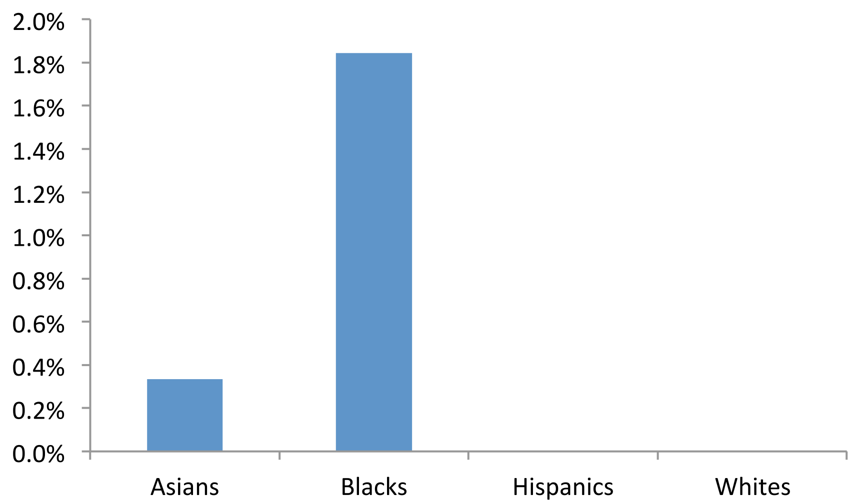


GRAPH 2.18: GLASS BY ETHNICITY



Variable	Glass
Asians	0.00%
Blacks	3.46%
Hispanics	0.00%
Whites	0.21%

GRAPH 2.19: MISCELLANEOUS BY ETHNICITY



Variable	Miscellaneous
Asians	0.33%
Blacks	1.84%
Hispanics	0.00%
Whites	0.00%

GRAPH 2.20: PAPER SUBCATEGORY PERCENTAGE IN ALL SITES SEE PAGE 15

GRAPH 2.21: PLASTIC SUBCATEGORY PERCENTAGE IN ALL SITES SEE PAGE 15-16