

**An Empirical Investigation of the Possible Presence and Extent of Arbitrary
Profiling in the Charlotte-Mecklenburg Police Department**

Final Report to Charlotte-Mecklenburg Police Department

By

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Executive Summary

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Of Final Report:

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This report examines whether and to what extent the Charlotte-Mecklenburg Police Department (CMPD) arbitrarily profiles citizens in their jurisdiction. For purposes of this report, citizens who have been stopped or otherwise detained based on demographic characteristics, such as race, rather than on the objective behaviors of the citizens are defined as having been subject to arbitrary profiling. The information used in the analysis include the vehicular and pedestrian stop data provided by the CMPD, accident data obtained from the North Carolina Division of Motor Vehicles, and demographic data compiled from the U.S. Census Bureau. In addition, citizens' calls for service (911 calls) are utilized to help determine whether the stops and searches in various areas of the city are consistent with citizen demands for policing in those same areas. Traffic accident and census data are used to create estimates of the racial composition likely to be found in particular areas of Charlotte-Mecklenburg and thus provide baselines for comparisons with the CMPD stop and search data. **In general it is found that stops and searches are largely accounted for by demand for police services and success in finding contraband, and not the demographic characteristics of the citizens. Still, the analyses do identify particular geographic areas where the number of African Americans stopped and/or searched surpass what we would expect given our prediction models. In other areas, however, there are fewer African Americans stopped and/or searched than the statistical evidence indicates would be expected. Several possible reasons for these disparities are addressed and discussed.**

Our task as researchers is to provide an empirical assessment, within the limits of the data available to us, of the degree of racial and other disparities in the stops and

searches of pedestrians and of vehicles. Whether a specific level of disparity is excessive ultimately depends on what is deemed appropriate levels of enforcement by the CMPD the citizen advisory board of this project, and the Charlotte-Mecklenburg community. Our report provides descriptions and estimates of disparity across groups. Because age and gender are well known correlates of violation behaviors -- with men and the young more active --- we expect, and find, more stops and searches of these demographic groups. **We focus on disparity in the stops and searches of African Americans, as this group is most discussed as the target of racial or arbitrary profiling.**

There are **four primary outcomes** that we evaluate: **1) pedestrian stops, 2) vehicular stops, 3) consent searches at pedestrian stops, and 4) consent searches at vehicular stops.** In all four instances we find that there are **some districts with more African Americans stopped or searched than we would expect**, given the demographic makeup of the area and the demand for police presence as reflected in the area's calls for service. At the same time **there are some districts with fewer African Americans stopped or searched than we would expect.** The information available to us and the resulting prediction models do not allow one to make a definitive claim that those areas with greater numbers of African Americans stopped or searched indicate areas where racially biased policing is taking place. Similarly, we do not know why, with certainty, some areas show lower numbers of stops and searches of African Americans than our model of such processes leads us to expect. We do discuss some possible explanations for these results, but decision makers must evaluate all of the evidence, including information not available to us as researchers, to determine the extent to which

racial bias may be a contributing factor and what remedial steps may or may not be necessary.

Summary of Findings for Pedestrian Stops

Approximately seventy-four percent of the 5,649 citizens stopped by the CMPD in Charlotte-Mecklenburg were African American. The first question we address is whether the number of pedestrian stops is a function of demand for service in geographic areas. We defined as geographic areas the census defined block groups (roughly 1,800 people per block group, with 373 in Charlotte). **We tested various factors as being predictive of the number of pedestrian stops and found that there were two important predictors (in regression equations) of the overall numbers of pedestrian stops and the number of pedestrian stops of African Americans. These factors were 1) demand for service for what we call “incivility” calls for service (citizen calls to police for prostitution, drugs, inebriated pedestrians and fights), and 2) success in searches. Racial composition of an area was found to have no independent effect on the number of stops when the other factors were controlled for statistically in the model.** (See Table ES1 for a summary of the important factors found to be predictive for each of the outcomes examined in the analysis.)

These results do not indicate that all sub-areas of the city are within a normal range of pedestrian stops of African Americans, however. **Figure ES1 below shows that some census block groups (each square on the figure represents one or more census block groups) have more African Americans stopped in that census block group than our model predicts, while others have less.** The predicted value for each census

block area is the center diagonal line. These values are predicted using a regression equation. The middle red line in the figure is the regression line and represents the expected number of African Americans that should be stopped, given the known influence of the demand for service for incivility offenses and the success at finding contraband in the form of drugs and alcohol. The two lines running parallel with the

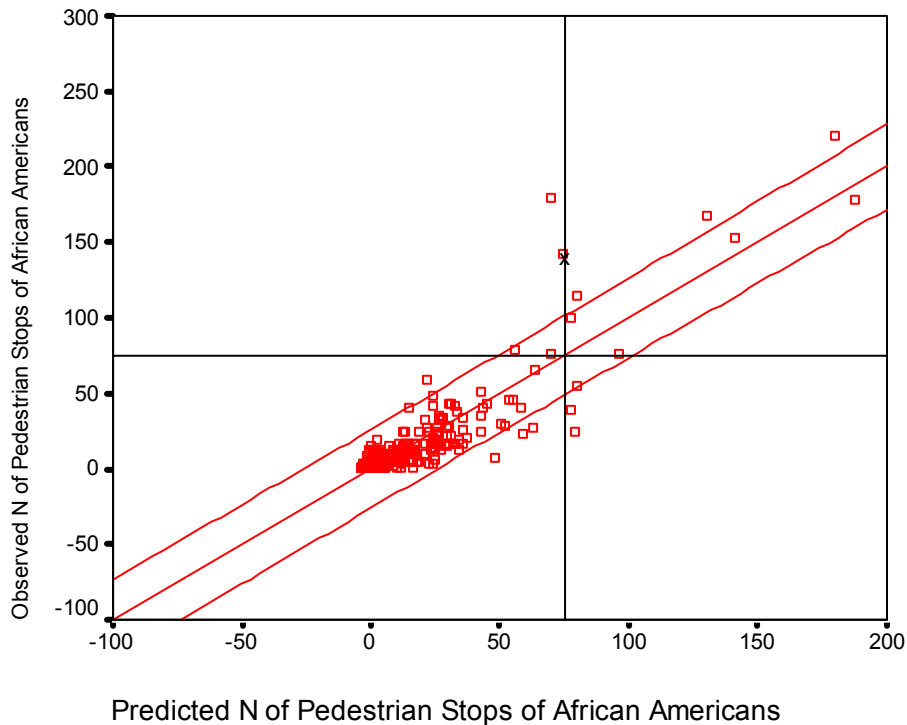
Table ES1 Summary of Key Findings

| Outcome | Important Predictive Factors |
|---|--|
| N of Pedestrian Stops | N of Calls for Service for Incivility Offenses N of Successful Consent Searches in Pedestrian Context (Drugs or Alcohol Found) |
| N of Driver Stops (Vehicle Stops) | N of Drivers in Accidents N of Successful Consent Searches in Vehicular Context (Drugs or Alcohol Found) |
| N of African American Pedestrian Stops | N of Calls for Service for Incivility Offenses N of Successful Consent Searches in Pedestrian Context (Drugs or Alcohol Found) |
| N of African American Driver Stops (Vehicle Stops) | N of White Drivers Stopped N of African American Resident Population N of African Americans in Accidents N of Successful Consent Searches in Vehicular Context (Drugs or Alcohol Found) |
| N of African American Pedestrian Consent Searches | N of Calls for Service for Incivility Offenses Success Rate of African American Consent Searches in Pedestrian Context (Drugs or Alcohol Found) |
| N of African American Consent Searches in Vehicular Context | N of Calls for Service for Incivility Offenses N of Stops of African Americans in Vehicular Context |

predicted regression line represent 95% confidence intervals of the predicted values. **We define “outliers” as the values that lie outside this confidence interval.** Census block groups below the lower diagonal line represent those with fewer African Americans stopped than the model would lead us to expect.

Also note that there are two perpendicular “reference lines” in the figure – each corresponds to the value of 75, arbitrarily chosen to show that when the regression line predicts that 75 African American pedestrians should be stopped, we have no census block group with exactly 75 African Americans stopped as pedestrians. However, we do

Figure ES1. Predicted Number of African Americans Stopped as Pedestrians by Observed Number of African Americans Stopped



have a positive outlier with approximately 140 African American pedestrians stopped. This outlier is marked with an “x”. It would be useful to be able to determine why this census block group, in particular, -- with 65 more African American pedestrians stopped than the 75 predicted by the model -- as well as the other four positive outliers, does not conform to our prediction. Unfortunately, we do not have data that allow us to more directly account for these outliers.

Factors not examined here may account for the “low” or “high” numbers of African American pedestrian stops. Census block group areas with relatively high numbers of African American pedestrians (“positive outliers”) could be the result of unique aspects of the neighborhoods in question, such as a history of drug problems or known drug traffickers not adequately measured by the 911 calls. Other omitted factors could include community and political groups who request additional policing in high need neighborhoods. Neighborhoods with greater levels of community policing may have higher numbers of African Americans stopped, relative to the demand and search success factors used in our model.

Figure ES1 and the geographic location of the outliers were presented to local police leaders. **Some possible factors to explain the positive outliers** were noted by the police leaders familiar with the areas in question. These factors include: 1) the presence of a **local college** (historically African American) – which may account for more African American pedestrians than in other areas, all else being equal; 2) the presence of a **public housing complex** with a history of drug-related problems; 3) an area may have been defined by the police as a **“hot spot”** and thus subject to an “aggressive” police presence (including bike patrols) to address the problems in that area; 4) the presence of

convenience stores (where alcohol is sold) and “winos” hang out – the latter are often the subject of pedestrian stops; 5) a “**red light**” **area** where street prostitution is a problem that occupies the attention of the police; 6) the presence of a **large “homeless” population** near the city shelter and soup kitchen (presumably there is a greater police presence and pedestrian searches are incidental to that presence; also some of the behaviors of the homeless are triggering the police stops); 7) the area is a **central downtown area** (where there are many pedestrians due to the concentration of people in relatively small areas); and 8) the area is near one in which there are many “**special events**” (e.g., stadium events).

Negative outliers – areas with “too few” African American pedestrian stopped (that is, the census block area found to be below the confidence interval of the prediction model) might be accounted for by the following factors (again according to local police leadership): 1) the area is subject to a **federal drug enforcement** effort so local police have less of a role; 2) the area is **largely Hispanic** (thus, there would be fewer African Americans stopped); 3) the area is where there has been “**Neighborhood Action Teams**” involved to reduce crime – this type of police presence is less oriented to stop and search interventions; 4) the area includes a **research park** (where presumably there is little activity at night, low crime, and (possibly) relatively few African Americans – driving down the total numbers of African Americans for the whole census block group); 5) area is “hard to get to” in that there is **no “thoroughfare” running through the area** (thus, police presence would be less than otherwise would be the case); and 6) some officers are **under-reporting their stops** (not filling out the stop forms). In the course of the discussion it was mentioned that a couple of the negative outliers did not

seem to have any obvious explanations other than they were next to an area that was a positive outlier, suggesting a **“lightning rod” effect** where one neighborhood drew the police attention while the other did not (despite having a high volume of calls for service for incivility offenses.)

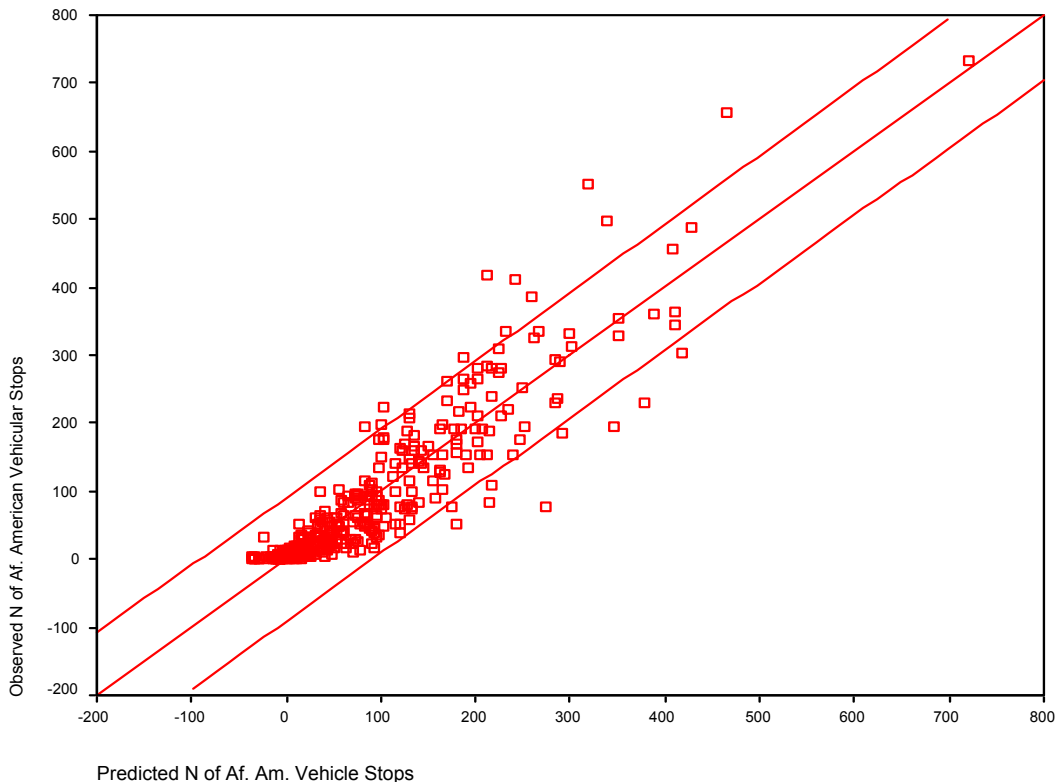
Summary of Findings for Vehicular Stops

Similar to pedestrian stops we modeled the number of vehicular stops for each census block group, as well as the number of African American vehicular stops and consent searches. African Americans made up 42.3% of the drivers of vehicles stopped (whites 51.3%). The major factors we found determining the overall number of stops of vehicles include the number of drivers in accidents and number of successful consent searches in the vehicular context. **The important predictors for the number of African American drivers stopped were the number of white drivers stopped, the resident African American population, the number of African American drivers in accidents, as well as the number of successful consent searches in the vehicular context.** We interpret these findings to mean that citizen demand is important in accounting for police presence, i.e., police are called to patrol for public safety matters where accidents occur. Further, the demographic makeup of the drivers is important (as measured by African American residency and involvement in accidents), as is the success in finding contraband.

Figure ES2 below shows the distribution of census block groups around the regression line for the number of African American drivers stopped. Again, boxes above the regression line represent areas with higher than expected numbers of African

American drivers stopped. Boxes below the regression line represent areas with fewer African Americans stopped than expected. As can be seen, some areas lie above and some below the regression line. Again, we do not know with certainty that areas above the regression line represent an “excessive” number of vehicular stops of African Americans. Likewise we cannot be certain that the linear additive model shown in the figure and assumed to reflect the command reaction to calls for service in an area adequately captures this relationship (See Appendix F for a discussion of non-additive or logged models.)

Figure ES2. Predicted and Observed Number of African American Drivers Stopped



In attempting to better understand the factors that might account for the identified positive or negative outliers, we presented a map of the outliers to police leadership of the

districts involved. They suggested the following possible explanations for the positive outliers: 1) **checkpoint activity** (i.e., the location of a vehicle check point); 2) **a rash of accidents** in an area resulted in more patrolling in 2002; 3) presence of **major north-south and of east-west thoroughfares**; 4) **proximity to the coliseum**; 5) presence of a **police substation**; and 6) **“crackdown” area** where drivers are “stopped for everything” because of erratic driving.

As for the negative outliers of African American vehicular stops, the police leadership suggested: 1) prevalence of **“service roads” rather than thoroughfares**; 2) prevalence of **“dead-end” roads** (thus traffic is perceived to be limited and access to the area by the police is also limited); 3) area with predominantly **white commuters**; 4) presence of a predominantly **Asian and an Hispanic population**; and 5) presence of a large **shopping center** (with private security).

Summary of Findings on Pedestrian Consent Searches

The literature and debate on racial profiling has often centered on the searching of citizens in the context of what is called a “consent search.” In a consent search the officer asks the citizen for permission to conduct a search of the person or personal belongings. Seventy-two percent of the consent searches of pedestrians were of African American.

An important element in explanation of consent searches is the success rate in finding contraband. Success rates are shown to vary with the volume of consent searches. Where there are more consent searches conducted, there is less success in finding contraband. The volume of consent searches varies with the hour of the day as well as with the neighborhood context. We find that for African Americans who are

consent searched in neighborhoods with relatively high levels of incivility calls for service the success rate is lower than it is for African Americans in contexts with fewer calls for service for incivility offenses. However, the success rates for whites in pedestrian consent searches in high incivility neighborhoods is even lower (11.7%) than that of African Americans.

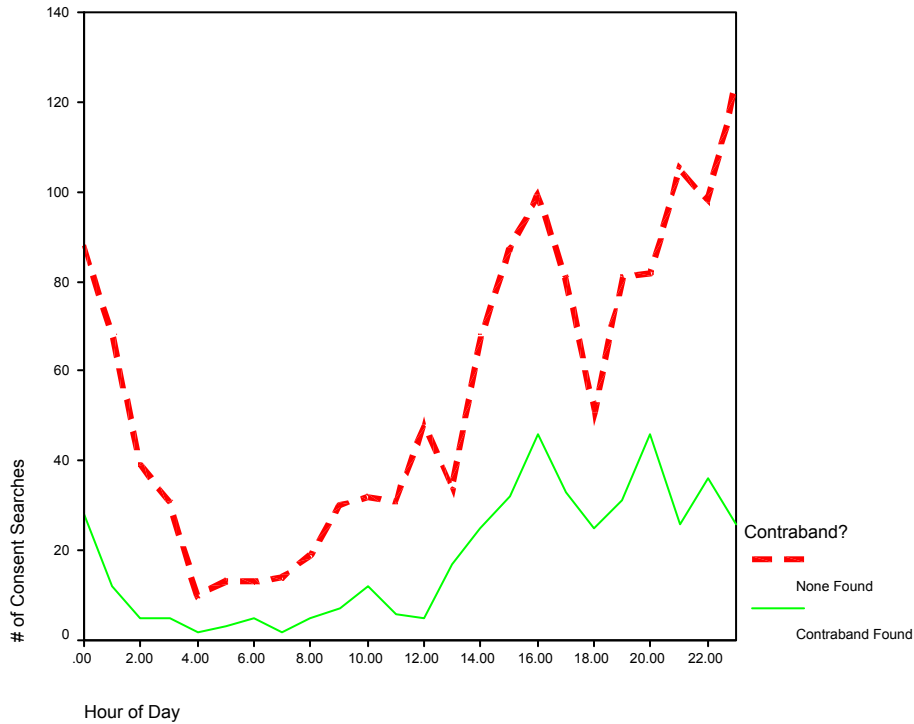
The **inefficiency in finding contraband** (mostly drugs, but also alcohol, firearms, and drug money) **varies with the time of day**. Figure ES3 shows the success rate in finding contraband by hour of the day. Notice where there is a large distance between the two lines in Figure ES3. The relatively inefficient times of day for finding contraband are at 04:00 and late evening/early morning hours. At the same time, these same hours are the times when many successful searches for contraband occur – note the “spikes” at 16:00 and 20:00.

We identify areas of the city (census block groups) with relatively high numbers of pedestrian consent searches of African Americans relative to a statistical model in which the following factors are the most important: **number of incivility calls for service and the success rate of African American consent searches in the pedestrian context**.

The areas with the relatively high and low numbers of consent searches of African Americans appear in Figure ES4 below. Similar to the pattern we observed earlier for pedestrian stops, some areas have relatively high numbers of consent searches in the pedestrian context, while some have low numbers. Whether those areas with relatively high numbers are indicative of bias, we cannot say. It is possible that the searches in those areas can be justified by factors not included in our model, including a history of

drug problems, amount of drugs seized, demand from the community for police to do searches (perhaps from local political groups), and so forth. Also, we do not claim

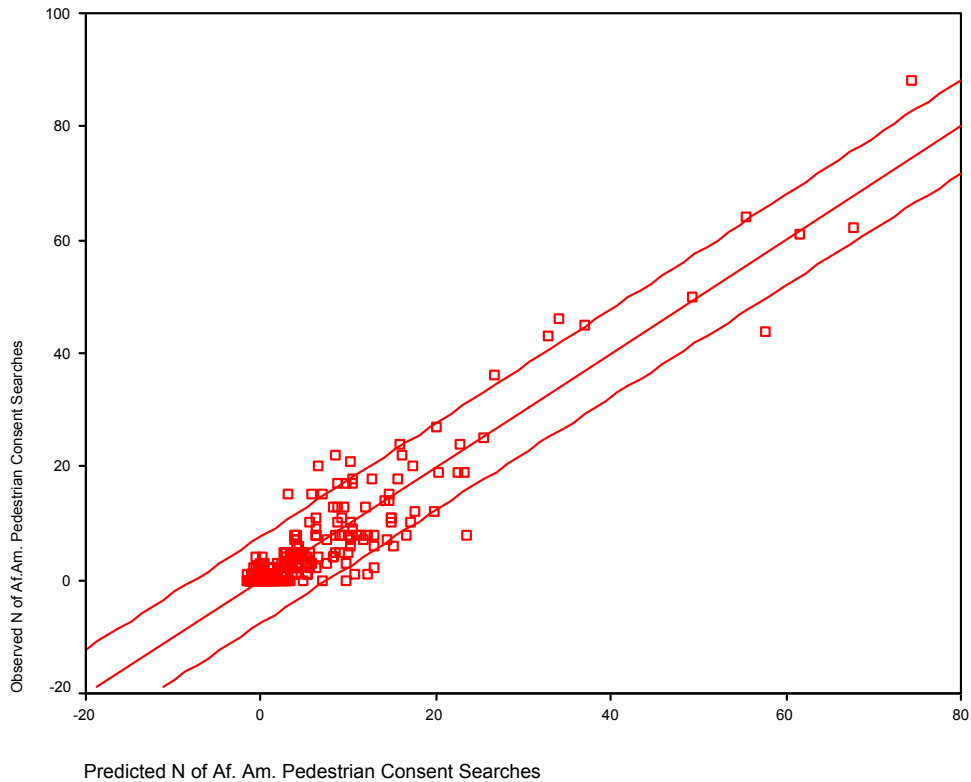
Figure ES3. Number of Consent Searches by Hour of the Day: Contraband Found or Not



that the functional form of the model (here a linear additive model) is necessarily the most appropriate form of the model – see Appendix F.

The local police leadership offered some of the same factors discussed above for outliers in the number of African American pedestrian stops to explain the outliers in searches. For African American consent searches in the pedestrian context, these additional possible explanations for the positive outliers were mentioned: 1) proliferation of **street prostitutes** in an area such that searches were often less likely to find contraband; and 2) an **aggressive drug enforcement area**. For negative outliers in African American pedestrian searches, the police leadership discussed the following:

Figure ES4. Predicted Number of African American Consent Searches in Pedestrian Context by Observed Number



1) presence of a large **cemetery**, driving down the pedestrian traffic in the area and thus lowering the number of consent searches; 2) **“lightning rod” effect** of an adjacent hot spot neighborhood that draws police resources away from nearby neighborhood areas; 3) **local shopping center with private security**; and 4) possible **underreporting of stops and searches** by some police officers.

Summary of Findings on Vehicular Consent Searches

Results for vehicular consent searches are generally similar to that found for pedestrian consent searches. African Americans constitute 64.3% of all those subjected to a consent search at a vehicular stop. When we modeled the number of African Americans stopped and consent searched per census block group, we found the following factors to be important: number of calls for service for incivility offenses and the number of vehicular stops of African Americans. (To a lesser extent, number of white vehicular consent searches, number of African American residents, African American consent search “hit rate” and age of residents are factors). Thus, unlike the models for the other outcome measures, there were several factors with effects.

We identified census block groups with relatively high and low numbers of African American consent searches in the vehicular context. Figure ES5 below shows the results of that analysis, and it identifies some areas with counts of African American consent searches well above the regression line, as well as areas well below the regression line. As was the case with the pedestrian stops above, we cannot say whether the number of consent searches here is excessive, or whether the linear additive assumptions of the model are to be preferred.

Some possible reasons for the positive outliers, as per the suggestions of the local police leadership, include **factors already mentioned** for the outliers in the above figures. As for negative consent search outliers of African Americans in the vehicular context, they mentioned: 1) presence of a **research plaza**; 2) a downtown area where searches were unlikely to be conducted due to the **heavy pedestrian traffic** on the streets; and 3) prevalence of new, small homes with many **“dead end” streets**.

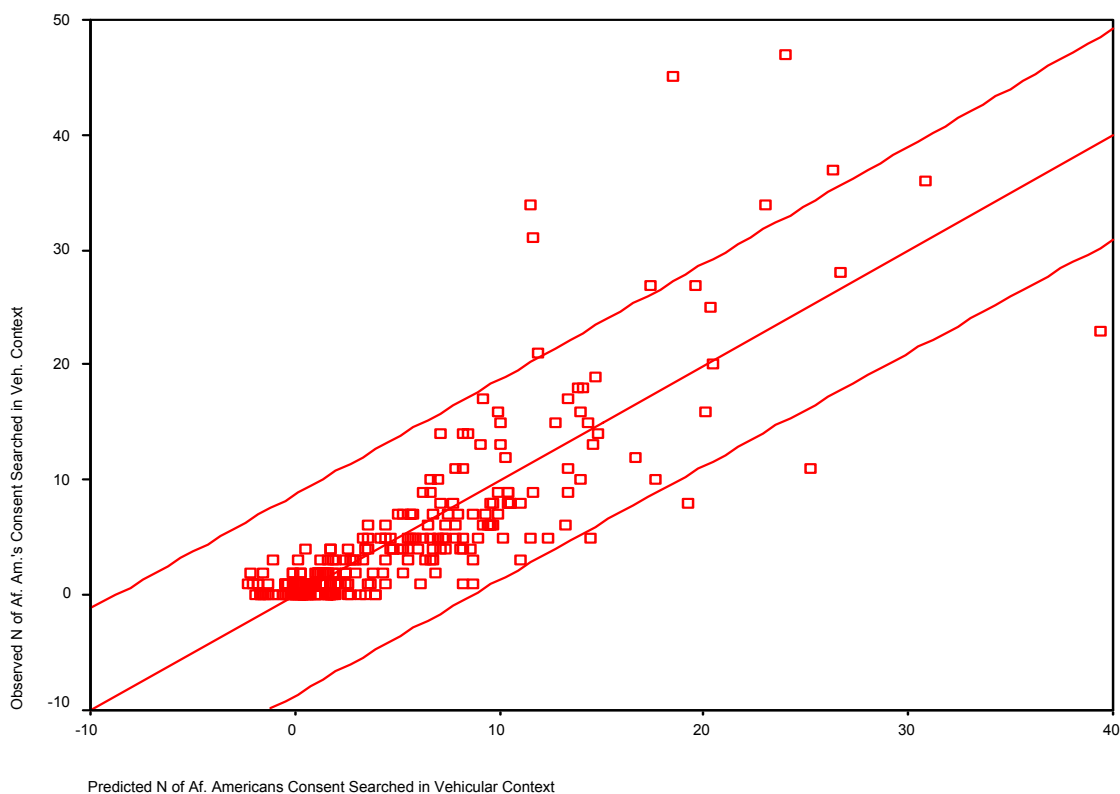
Conclusions

In general we found that **the prevalence in the number of stops of citizens in the pedestrian and in the vehicular context is not accounted for by the racial makeup of the census block groups** with which the data were analyzed. The factors that generally account for the number of stops are factors associated with the calls for service in the area, particularly **calls for “incivility” type offenses (prostitution, drugs, inebriated pedestrians, and fighting)**. Also important is the **success in finding contraband**, especially drugs and alcohol. In areas **where there are more incivility calls for service and where there is more success in finding contraband, there are more pedestrian stops and searches.**

For vehicular stops, the number of drivers in accidents is the best predictor of the number of vehicular stops, but success in finding contraband in consent searches is also important. The number of incivility calls for service is not a statistically significant predictor of the number of vehicular stops. **For neither vehicular stops nor for pedestrian stops is the racial make up of the population a factor in determining the number of such stops. The number of incivility calls for service in a census block group is important for consent searches of African American drivers, as it is for pedestrian consent searches.**

That being said, the results of our analysis show that there are some areas of Charlotte where there are **more stops and more searches of African Americans than one would expect, given the factors we have identified as relevant to such police**

Figure ES5. Predicted and Observed Numbers of African American Consent Searches at Vehicle Stops, by Census Block Group



activities. At the same time, **we have found areas where the levels of stops and searches are below what our models predict.** Whether or not the degree of departure from the model’s predictions represents excessively high or excessively low rates cannot be determined conclusively in this report with the available data. More information is needed. The CMPD has supplied more specific information about the areas that were identified as outliers, and we have reported them in the report (as discussed above). Such information has to do with the **history of drug problems and drug seizures** in an area, the **demand for service in an area through political organizations**, identification

of the location of **hot-spots of crime**, areas targeted for **community policing** activities, and other idiosyncratic characteristics of neighborhoods. The CMPD in conjunction with the citizen advisory group of this project should discuss these factors and try to draw conclusions about whether the degree of stops and searches are excessive in specific areas such that remedial actions need to be taken.