Research Proposal for
Handling Increasing Murder Rates in NYC

Prepared for
New York Police Department, New York
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1. Problem Statement

New York Police Department (NYPD) is concerned about the increased murder rates in New York city (Chapman, 2019)[i]. They found that the murder rates in NYC have risen steeply in 2019 as compared to the last year, and are a target of the citizens' concerns.

2. Management Question and Research Objectives

- The New York Police Department wants to effectively increase vigilance and reduce murders.
- The NYPD wants to understand where to re-optimize their forces to, and prevent murders.

3. Exploratory Questions

- Is the murder rate in NYC increasing every year, or is it just compared to the past year? Do we see a trend in the overall crime rates or the murder rates specifically?

  For analysing this, I review a report comparing 2017 and 2018 data on crimes (Grawert, Onyekwere and Kimble, 2019)[ii].
- Are the murders focused to a particular locality or neighborhood? If so, have there been any substantial changes in the demographics of the locality where majority of the murders were committed, in terms emergence of other crimes and/or increased number of reported crimes and suspect arrests?

4. Secondary Data Sources

4.1. NYPD Website

Majority of the secondary data required for the study will be scrapped from: **Published Crime and Enforcement Activity Reports and Homicide Reports** from the official New York Police Department website (Www1.nyc.gov, 2019)[iii].

The New York Police Department publishes weekly and annual reports for multiple crimes which contains various details such as ethnicities of suspects, demographics and count of victims,

demographics and count of arrests, and other relevant data on murders and shootings such as time, date, precinct, demographics along with detailed data on the victims and the suspects or convicts.

4.2. Literature Review

A **literature review** (Greene, 1999)[iv] will help understand the police policies and practices in New York City which will further guide my analysis and conclusion. Also to be reviewed is a book (Urban Health)[v] which talks about controlling crime in urban areas through law enforcement, and the effect of a strict of law enforcement on the crime rates. I will also review a paper published by NYU School of Law which compares the crime rates in US for 2018 with 2017, and provides detailed analysis of the trend (Grawert, Onyekwere and Kimble, 2019)[vi].

Further, the impact of problem-oriented policing on the prevalence of murder (White et al., 2003)[vii] will be helpful for the study, and a review of psychological interventions will be beneficial as well (Alves-Costa et al., 2019)[viii].

4.3. White Paper Review

A review of crime prevention techniques (TechRepublic, 2019)[ix] will help understand the ways in which NYPD can reduce the murders.

5. Investigative and Research Questions

- Which precincts or localities witnessed the highest number of total murders over the past year, was there an effective police vigilance in place which could have controlled these murders in those localities?
- Can a strong correlation be found across murders, in terms of: time (of the day of murder), and/or age of the victim?

6. The importance and benefits of the study

6.1. Increasing murder rates in NYC

New York City *(NYC or simply New York)* is the city with the largest population in the US *(c. 19 million in its metropolitan area)*. With over 50 million tourists every year, it is also the most visited city of the country and is an international center for culture and arts, fashion, music, business and finance; and its skyscrapers skyline, numerous landmarks and museums attracts many visitors. New York is considered the safest large metropolis of the US, with a crime rate per inhabitant even lower than the national average. However, given its status as the most visited city in the US, petty theft against tourists is not uncommon (Safearound, 2019)[x] and it has been witnessing a huge increase in the murder rates, making the neighbourhoods increasingly unsafe for residents. Although US recorded a decrease in the overall crime and murder rates over the last year (Nytimes.com, 2019)[xi], the murder rates within New York city significantly increased over the last year (Parascandola, 2019)[xii].

6.2. Provide an understanding to NYPD to help reduce murders

The NYPD has been trying to put out their best to prevent any sort of illegal activity and provide a safe neighbourhood for all. With a significant rise in the murder rates in the city, **NYPD is increasingly concerned**, and would be interested to further understand different statistics about these murders, which can help predict and **prevent these murders** to a certain extent, and also provide extra units and surveillance to the areas in need. An analysis of the murders over the past year, with a focus on which areas witnessed the highest number, and, a correlational study for the demographics of certain characteristics of the victims will help NYPD to obtain a clear picture in regards to the murders, and understand probable causes for the same. It might happen that there existed a fault in the internal team, or that there were increasing number of criminals who moved into the locality, or maybe that the murders are in strong relation to activities performed by the people of a certain age group, which induces the murders.

7. Type of research study

The research study comprises of the following two aspects:

i. Collection of **primary data** through a survey amongst the neighbourhood residents, and an expert interview of a senior police official from NYPD.

ii. Analysis of the **secondary data** as published on the NYPD website and other published articles, which includes statistic and demographics about the murder victims, suspects and convicts.

7.1. Exploratory Research

Exploratory research would be immensely beneficial for the study. This will help capture background information and perfectly measure the constructs in alignment with the management dilemma. Also, it will help identify the sources for the samples, for surveys and other purposes. The **literature review** will provide a good justification as to whether increasing vigilance in areas of high activity will lead to a reduction in the murder rate. An expert interview with a senior police official will help provide an in-depth understanding about the murders from their own perspective, and could lead to insights as to why they were unable to prevent them.

7.2. Descriptive Study

The type of research is a **descriptive study**, wherein the aim is to understand the reasons behind these murders (from a lack of police services standpoint), and help prevent them in future. It will be assisted by a **correlational study** between two variables relating to the murders.

7.3. Variables

- ***Dependent Variable:*** Murder rate (which includes the number of murders taking place in the numerator)
- ***Independent Variables:*** Demographics of the murder victims – ethnicity and age, statistics about the murders itself such as the time of murder and age of the murdered.

In order to understand and measure the above-mentioned variables successfully, exploratory research would be the most suitable form as it is the bottom-line to study factors leading to a certain

phenomenon, and also understanding where the gap lies. Also, descriptive study is selected because it aligns with the thought school that it is used to describe certain phenomena or characteristics about it and discover relationship among different variables, in our case, study the characteristics about the murders and also a correlation between two characteristics.

8. Methodology

8.1. Primary Data Collection

8.1.1. Surveys

Once we have identified the specific precincts to study, **Surveys** will be of utmost importance in collecting the views of the people residing in those neighbourhoods witnessing high number of murders. It will include but not limited to questions such as:

- How effective is the police vigilance in your area, on a scale of 1-5,
- Do you feel there was a major change in your locality, in terms of residents living, yes/no,
- Which age group do you belong to (with options for 4-5 groupings),
- How comfortable are you walking alone on the streets in your area, on a scale of 1-5.

This will help gather primary data about the safety concerns of the residents, and their views as to the efficiency of the NYPD in their area. Surveys are a versatile instrument for research, are time efficient, and can reach a large geographic area, if done via internet, social media or SMS services.

8.1.2. Interviews

Interview with the police officers would be conducted in the specific identified localities, and the basis for the same would be to understand the internal views about their own effectiveness in vigilance, were they aware that a large group of possible criminals had moved into those areas, and whether the incident reports and illegal activity reports were on a rise in those areas, which could have hinted towards a need for increased police vigilance. Also of importance would be to understand if the police knew about these matters, and failed to take immediate action, or whether the top management chose to ignore the repeated requests by the lower department.

8.2. Limitations to primary data collection

Limitations include low participation rate, measurement errors, inaccessible populations and non-generalizability of the results. The question content and sequencing will also play a major role in the participation and response error rates. Another limitation would be the **errors**: systematic errors, which may include respondent errors such as non-response error or response bias of unconscious misinterpretation.

8.2.1. Handling limitations to primary data collection

In order to tackle with these limitations and to improve survey response rates, techniques such as appeal for participation which can help increase the residents' own safety, and also promise for anonymity could be used. In addition, to significantly reduce the respondent errors, it will be imperative to make sure that the surveys are kept short and contain simple language to easily fit the constructs of the respondents, and reduce cognitive load. Also, surveys will be conducted in-person wherever possible to minimize non-response error and response bias of unconscious misinterpretation.

8.3. Secondary data collection

8.3.1. NYPD Website

Published Crime and Enforcement Activity Reports and Homicide Reports from the official New York Police Department website (Www1.nyc.gov, 2019)[xiii] will be used to analyse data such as ethnicities of suspects, victims, arrests, and other data on shootings such as time, date, precinct, demographics and other relevant data of the victims and the suspects or convicts. The NYPD publishes weekly and annual reports for different crimes and traffic offences which are classified into: citywide reports, borough and precinct reports and New York parks reports. They also publish the same in their advanced digital platform CompStat 2.0 in addition to the regular excel and pdf publishing. *Appendix I* shows a sample report published by the NYPD CompStat 2.0 software.

8.3.2. Other sources

Other secondary sources which will be used are newspaper and magazine articles about the crime and murder rates in New York city (Nypost.com, 2019)[xiv] and how it compares with other cities (Baruch.cuny.edu, 2019)[xv], why it bumped after hitting a record low in 2018 (Kanno-Youngs, 2019)[xvi], how the Brooklyn bloodbath (Cbsnews.com, 2019)[xvii] affected the numbers, and white paper review and literature reviews, all which have been stated previously, to understand the characteristics about the murders, if increased number of incident reports in an area is an indication of increased murders, and if increasing vigilance actually helps in reducing murders. A wise idea here will be to also study the areas with significantly low or zero murder rates and understand how they have been accomplishing it.

8.4. Limitations to secondary data collection

Limitations include limited access to published data on the NYPD website, the credibility of the data and availability of a complete dataset. There might also be **errors** involved such as administrative error of data processing, and appropriate data selection.

8.4.1. Handling limitations to secondary data collection

In order to overcome these errors, our experts will arrange appointments with the data collection officer, and understand their internal process of data recording, and publishing. Also, if any of the numbers and facts seems as an outlier, they would be discussed in person with the police officer in-charge for that particular case. To get full access to data, I will appeal to the senior management providing reasons as to the benefits of the study, and also guarantee the secrecy of sensitive data by way of using pseudo names in my report. It will further be guaranteed that only limited personnel will have access to the full data set, who would have signed a non-disclosure agreement.

8.5. Critical Path Method

The expected time frame for the entire study could be estimated at 30 days and a **critical path method** *(CPM)* has been put out in *Appendix II.*

8.6. Constructs and Operational definitions for the study

- **Murder rate:** The total number of murders committed in New York city during the past year
- **Time of murder:** The date and time of the murder, to be used in studying correlation
- **Age of victim:** The age of the murdered person, to be used in studying correlation

8.7. Other limitations to the study

- Evaluating information sources involves a complicated procedure
- Purpose, it might be easy to get drifted away to another agenda or goal
- Scope, age of the published data and its comprehensiveness on the relevant topic is important
- Authority, verifying the credibility of the source might not be an easy task
- Audience, degree to which the data might suit our necessary level of knowledge or expertise needs to be taken care of at each element of the study
- Cost and time duration of the research study

9. Population and sample selection

9.1. Sampling

The population of the study would be the entire 8.399 million (Www1.nyc.gov, 2019)[xviii] people of New York City, and the sample size for the survey would include the residents of those specific precincts which witnessed a high murder rate over the last year. This is because, as mentioned earlier, I will focus on high murder areas only, and white papers and literature reviews will be essential to justify these. To determine this sample, firstly the data about the total number of murders over the past year will have to be studied precinct-wise, and then a list needs to be curated indicating which precincts witnessed the highest number of murders over the past year. As this sample comprises of specific precincts, means it will be a non-probability sample selection. Now, within these particular precinct samples, it might still be a huge number of residents to study, hence the need for a probability sampling. Stratified sampling would be apt for this purpose, the precinct would need to be divided into naturally existing sub-groups based on the building number they live

in, and the survey would be sent out to random people from each of those buildings, keeping in mind that the random selection from each building is proportionate to the total population size of the buildings. This will involve deeper data analysis about the neighbourhoods.

9.2. Limitations and how to tackle them

- **Selection Bias:** the procedures used to select samples might over or under-represent segments of the larger population. This bias is not likely in our study as we will be selecting random samples from only those precincts which witnessed a high number of murders, and, all members of the stratified sample group will have equal likelihood to be selected. The surveys will be sent to random people in every building of the precinct, in a proportionate manner. Though, it needs to be made sure that the random sample includes people of various different demographics, for which, I will need to create a tally matrix to check if we are over or under-counting certain attributes of the demographics. And then, manually input those into our sample.
- **Response rate bias (non-response bias):** It might happen that a lot people from the precincts were not affected in any manner from the murders, and hence chose not to respond to the survey. Now, the responses are associated with the variable we are measuring, and so the random sampling might be broken. Those people whose were affected by any of the murders might have a strong motivation driven by anger to take the time to respond (literature review mentioned previously). This might make our survey results inappropriate to judge the precinct overall. To prevent a non-response bias, it is essential to use the techniques mentioned earlier, such as appeal for participation and promise for anonymity. It needs to be stressed that the survey can help improve their own safety and reduce the murder rates in their own locality. This will help tackle the issue of non-response bias to a large extent if not fully.
- **Validity:** There will also exist threats to validity which have been discussed later in *Section 11*.

10. Analytical Methodology

10.1. Type of analytical study and hypothesis

In the research study, I am trying to find which precincts need increased vigilance, and then trying to derive whether there is a strong correlation between the time of murder and age of victim.

The first part of the study, where I am trying to identify which precincts need more attention, would be a general study of comparing the total number of murders in each of the precincts and rank the precincts needing more attention, based on the number of murders.

In the second part, there exists a relational hypothesis as I am studying the relationship between two variables. The hypothesis and errors for the same can be defined as:

- **Null Hypothesis:** There is a strong positive correlation between the time of murder and age of the victim
- **Alternate Hypothesis:** There is no correlation between time of murder and age of the victim
- **Type I Error:** I derive that there is no strong correlation when in reality it does exist.
- **Type II Error:** I derive that there is a strong positive correlation when in reality there isn't.

The methodology used here will be the **bivariate correlation analysis**, using the **Pearson correlation coefficient**. This analytical methodology will successfully will help understand the measure of association between the time of murder, and the age of the victim. The continuous variables are time and age, and both are measured on an interval scale, and are linearly related to each other. Also, the coefficient does not distinguish between the independent and dependent variables. Hence, this type of research study falls under the Pearson (product moment) correlation coefficient of the Bivariate Correlation Analysis measure of association.

The Pearson correlation coefficient varies over a range of +1 through 0 to -1. The correlation coefficient will reveal the magnitude and the direction of the relationship, and the magnitude will represent the degree to which variables move in unison or opposition. My null hypothesis states that the coefficient will be near to +1.

10.2. Type I and Type II error reduction

10.2.1. Reducing Type I errors

It is never possible to completely eliminate the probability of a Type I error. However, the probability of rejecting a true null hypothesis can be minimized by picking a smaller level of significance α before doing the test (requiring a smaller p-value for rejecting H_0). But, lowering the significance level might also lead to a situation wherein the results of the hypothesis test may not capture the true parameter or the true difference of the test. The options for handling this have been discussed later below.

10.2.2. Reducing Type II errors

The best way to minimize the probability of a Type II error (failing to reject a false null hypothesis) is by picking a larger sample size. The sample size primarily detects the amount of sampling error, which translates into the ability to detect the differences in a hypothesis test. A big sample size increases the chance to capture the differences in the statistical tests, as well as the power of a test. It would ideal for me to consider the details of each and every murder which took place in the last year and consider the entire murdered group sample for analysis. Another approach would be to choose a higher level of significance, but here the probability of committing a Type I error increases. Thus, we should always assess the impact of both the errors on the decision based on the results of the test and determine the appropriate level of statistical significance.

It is imperative to minimize the Type I error as much as possible, though some Type II errors can be allowed. Our motive is to find a correlation between time of the murder and age of the victim, it is better to have a true positive as it will help the NYPD to inform the residents accordingly and take precautionary measures when people of certain age groups are expected to be out of their homes during certain times of the day. It needs to be noted that it is not possible to reduce both errors simultaneously, but there needs to be trade-off as to what errors might we be accepting of, and what might cause a significant difference in our analysis.

11. Threats to Validity

Validity means that we are measuring what we actually want to measure, and accomplish the claims of our study. It needs to be stressed that we do not allow co-founding variables to deviate our results, and also see if there is possibility to generalize our results.

11.1. Threats to Internal Validity

There might be threats to internal validity factors such as **participant selection** and **participant history** (from the NYPD database), which might result in the conclusions I draw about a cause or relationship to be not fully accurate. I need to make sure that the conclusion I draw about there being a strong positive correlation between time of murder and age of victim, is not affected by some other variable. Further, I need to ensure that if there any major outliers in the results such as mentally ill participants or patients under heavy medication, I examine the outlier-causing participant carefully before taking their responses into consideration for analysis.

11.2. Threats to External Validity

There might also be external validity concerns that, the results I obtain from the analysis cannot be generalized across all precincts or the entire New York city at large. There might be several different factors across all different precincts and cities, and our results, most probably cannot be implemented across all regions to reduce murders respectively. I need to understand that all the different precincts will have their own set of results and those different results need to be used to make improvements in the respective localities, such as increasing the police force or requesting support from the residents themselves.

11.3. Other threats to validity

There might be a threat of Criterion Validity, that there are some variables in my study, which have a strong correlation with some other variables which we are not studying, and might affect the results significantly. For example, the exact location of murder might be an important variable, and might significantly affect the recommendation to the NYPD, but I am not studying this variable.

12. Conclusion and Communication of Results

My research analysis will reveal the precincts which witnessed the highest total number of murders over the last year, and I will provide a ranked list as to which precincts needs to be the focus of NYPD. This will give them an overall idea as to the areas or localities of interest.

For the correlational study, I expect to see results in terms of whether there exists a strong positive correlation or not. If there exists a strong correlation, then I would convey the information to the NYPD supported with the facts and figures from my research. I will urge them to spread awareness to people of those certain age groups which were found to be vulnerable at certain times of the day, about safety measures and precautionary activities. Also, for certain hours of the day, NYPD might consider additional forces in those precincts.

The pivotal motive was to help NYPD control murders in NYC, and I will give them detailed analysis in regards to these murders, in terms of precincts, and the relation between two variables. This will help provide them an overall picture of these murders, and intervene necessarily, such as deploying additional forces, increasing vigilance, conducting thorough background checks of all suspects, and providing necessary training and awareness to residents.

13. Expense Justification, Concerns and Potential Implications

The research study concerns the NYPD problems, and the citizens' concerns at large. The expenses will be justified by way of benefits that it will bring to both NYPD and the public at large. My study will not involve any major expenses, as it is purely based on internal data, and surveys. A huge amount of tax-payers money is spent on the police and other military forces of the country, and I would require only a minimal amount of it, which will help regain the trust of the public in the police forces, and be free from fears of murders and other crimes.

An argument here would that NYPD must have their own research and analysis team to identify reasons and trends in the crime rates in the city. But yet, they failed to control those murders, or probably their internal team failed to make appropriate recommendations. My recommendations will be ground solid supported with data, and justifications throughout.

The **concerns** that NYPD's team might raise might be the credibility and the viability of my research, and how applicable my results and recommendations might be to the overall population. But as I have mentioned, it will be limited to specific precincts in NYC, and hence my recommendations will solely be based on specific attributes of those precincts and hence, totally applicable.
I expect the NYPD team to fully consider my recommendations, as I will do a detailed analysis, and also, I am using first-hand feedback from the local residents, which makes my analysis even more credible and acceptable.

As a result, the NYPD will successfully be able to re-optimize their forces to certain areas which need more forces than others. Also, identifying a strong correlation and conveying them to the public will make the public self-aware about the situation, and induce them to take precautionary measures which further increases safety apart from the police vigilance.

All in all, I believe my research will be highly effective and will yield varied insights on several functions of the NYPD, and I intend to conduct it with full diligence to provide better than expected output.

Appendix I: Sample of NYPD report publishing by CompStat 2.0 software

Police Department
City of New York

Bill de Blasio
Mayor

James P. O'Neill
Police Commissioner

Volume 26 Number 46

CompStat

Citywide

Report Covering the Week
11/11/2019 Through 11/17/2019

Crime Complaints

	Week to Date			28 Day			Year to Date*			2 Year	9 Year	26 Year
	2019	2018	% Chg	2019	2018	% Chg	2019	2018	% Chg	% Chg	% Chg	% Chg
Murder	5	6	-16.7	22	17	29.4	286	271	5.5	10.9	-40.3	-83.4
Rape	19	37	-48.6	118	139	-15.1	1,590	1,608	-1.1	23.7	31.6	-45.3
Robbery	273	220	24.1	1,161	1,011	14.8	11,605	11,434	1.5	-4.9	-32.1	-84.6
Fel. Assault	350	344	1.7	1,466	1,479	-0.9	18,216	18,064	0.8	1.1	20.0	-50.8
Burglary	187	201	-7.0	844	897	-5.9	9,262	10,344	-10.5	-13.1	-43.8	-89.6
Gr. Larceny	859	824	4.2	3,586	3,507	2.3	37,765	38,243	-1.2	-0.7	13.4	-50.0
G.L.A.	115	103	11.7	456	416	9.6	4,764	4,869	-2.2	-5.1	-47.9	-95.2
TOTAL	*1,808*	*1,735*	*4.21*	*7,653*	*7,466*	*2.50*	*83,488*	*84,833*	*-1.59*	*-2.32*	*-10.12*	*-78.04*
Transit	60	45	33.3	224	234	-4.3	2,123	2,187	-2.9	-1.3	13.2	***.*
Housing	75	89	-15.7	353	339	4.1	4,357	4,131	5.5	0.8	17.0	***.*
Petit Larceny	1,691	1,587	6.6	7,063	6,655	6.1	77,973	75,780	2.9	6.2	7.9	***.*
Misd. Assault	719	698	3.0	3,207	3,002	6.8	37,915	38,120	-0.5	3.0	-7.4	***.*
UCR Rape*	50	54	-7.4	208	220	-5.5	2,514	2,493	0.8	18.9	***.*	***.*
Other Sex Crimes	92	81	13.6	385	373	3.2	4,709	4,574	3.0	11.0	***.*	***.*
Shooting Vic.	13	10	30.0	70	61	14.8	833	805	3.5	-0.5	-47.6	-84.3
Shooting Inc.	12	9	33.3	59	56	5.4	702	675	4.0	0.3	-46.5	-85.3

Historical Perspective

(Historical perspective is a complete calendar year of data.)

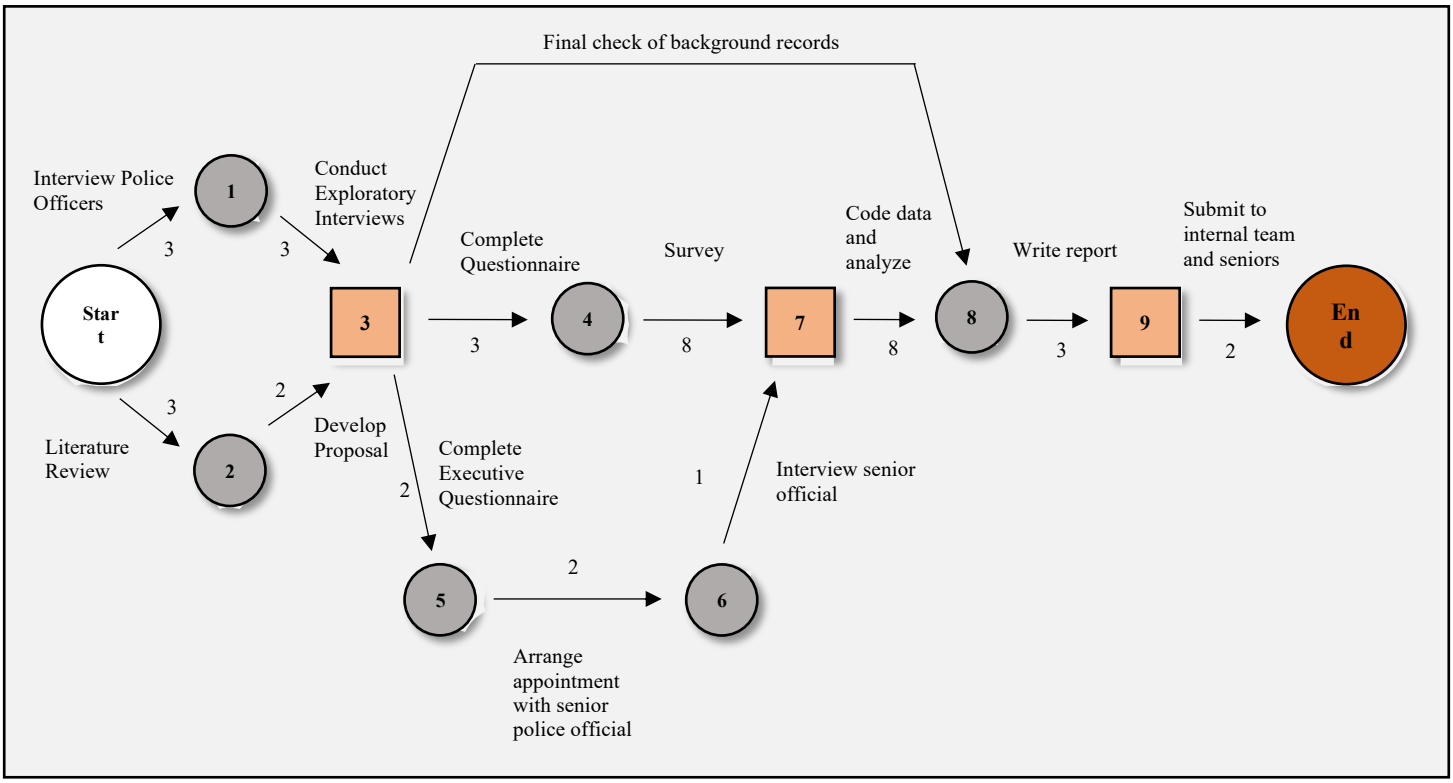
	1990	1993	1998	2001	2018	%Chg '18 vs '01	%Chg '18 vs '98	%Chg '18 vs '93	%Chg '18 vs '90	
Murder	2,262	1,927	629	649	295	-54.5	-53.1	-84.7	-87.0	Murder
Rape	3,126	3,225	2,476	1,930	1,794	-7.0	-27.5	-44.4	-42.6	Rape
Robbery	100,280	85,892	39,003	27,873	12,913	-53.7	-66.9	-85.0	-87.1	Robbery
Fel. Assault	44,122	41,121	28,848	23,020	20,208	-12.2	-30.0	-50.9	-54.2	Fel. Assault
Burglary	122,055	100,936	47,181	32,694	11,687	-64.3	-75.2	-88.4	-90.4	Burglary
Gr. Larceny	108,487	85,737	51,461	46,291	43,558	-5.9	-15.4	-49.2	-59.8	Gr. Larceny
G.L.A.	146,925	111,622	43,315	29,607	5,428	-81.7	-87.5	-95.1	-96.3	G.L.A.
TOTAL	*527,257*	*430,460*	*212,913*	*162,064*	*95,883*	*-40.8*	*-55.0*	*-77.7*	*-81.8*	*TOTAL*

Figures are preliminary and subject to further analysis and revision.
As of January 2013, complaints occurring within the jurisdiction of the Department of Correction have been disaggregated from the borough and precinct crime totals and are displayed separately on the Department of Correction CompStat page.
Unless otherwise noted, Crime statistics reflect New York State Penal Law ("NYSPL") definitions and differ from the crime categories used by the FBI Uniform Crime Reporting Program. All Crime statistics are translated to Uniform Crime Reporting categories for submission to the UCR Program.
* Uniform Crime Reporting ("UCR") Rape consists of all crimes defined in the FBI UCR definition of rape.

Prepared by
NYPD CompStat Unit

CompStat

Appendix II: Critical Path Method (CPM) schedule of the Research Design



Milestones

3 Proposal Approval
7 Interview and Survey Completed
9 Final Report Completed

Critical Path

S – 1 – 3 – 4 – 7 – 8 – 9 – E

Time to Completion

30 working days

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