Revitalizing Baltimore: A Smart Neighborhood Approach

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Abstract

This paper argues that a smart neighborhood approach focused on public safety is the missing element to revitalizing Baltimore’s inner neighborhoods. The research methodology consisted of reviewing the primary and secondary literature in the newly emerging field of “smart city” or “intelligent city” technologies that center on public safety and interviews with Baltimore city stakeholders that are currently revitalizing Baltimore. This paper makes the case that recent community-revitalizing efforts in Baltimore have not provided the necessary foundation to spur sustainable revitalization. It's my assertion that a smart neighborhood approach that utilizes grassroots organizing, and technology to achieve public safety goals can create the conditions for increased public and private investment in Baltimore inner neighborhoods. The primary recommendation is for Baltimore City to use security cameras to monitor events in real time, especially in neighborhood experiencing revitalization.

Keywords: Walbrook, Smart Neighborhood, Neighborhoods, Public Safety, and Baltimore Revitalization, Smart Cities

Research Questions

1. Can investments in public safety/security – especially those related to information technology – have a measurable impact on neighborhood revitalization in Baltimore and used as an economic development tool for the study area neighborhoods?

2. What elements of Baltimore’s traditional neighborhood-targeted public safety and economic development strategies need to be reformed to support investment in smart
city strategies? Can neighborhood-targeted housing investments be rethought in light of the recent unrest in Baltimore and data being produced by law enforcement?

3. How might an integrated, data-enhanced and neighborhood-targeted investment strategy benefit from an adjacent anchor institution, such as a hospital, university or regional retail destination?
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Introduction

“I have the audacity to believe that people everywhere can have three meals a day for their bodies, education and culture for their minds, and dignity, equality and freedom for their spirits. I believe that what self-centered men have torn down, men other centered can build up.”

- Martin Luther King, Jr.
You have to see the Baltimore riots unrest from my point of view to understand why I believe this is important. The morning and early afternoon of Monday April 27th was highly productive. I had returned from China after 10 days there on April 25th and was still shaking off the jet lag; however, I was still able to complete my work regarding the building of 4 single family houses on Clifton Avenue and develop plans to revitalize a public housing development in Baltimore City. I was also able to complete my presentation on Inclusionary Zoning for my Urban Lab class at 5:20 p.m. I’m a graduate candidate for a Master’s degree in Urban and Regional Planning at Georgetown University and work for a national development firm, The Woda Group.

I live at 2007 N Longwood Street and worked from home that day to recuperate from my trip. I talked with my partner about our presentation around 3:15 and jetted out the door to drive to the train station. Since I had ignored his call when I was reviewing my presentation, I returned my co-workers call when I was in the car to discuss the agenda for our Pittsburgh work. When I drove down Gwynn Falls Parkway passing Mondawmin Mall, I was what no words can describe but shook is the closest verb. To my left and across the street, more police than I could count in full riot gear boarding the parking lot to Shopper at Mondawmin Mall and the street. To my immediate right, more African American children than I could count in the street to the point where I couldn’t drive.
When I finally reached the corner of Reisterstown Road and Gwynn’s Falls Parkway, I couldn’t cross the 4 lane intersection so I turned down Reisterstown Road and down another side street and ended up on Druid Park Drive. Even though I was shook, I continued my conference call until I arrived at the Penn Station on Charles Street. Since I’ve thankfully never driven through a riot before, I was in a state of disbelief at what I witnessed and was still trying to access the severity of the situation. To help me recover, I asked the ticket agent, “What is going on?” It was a rhetorical question but she answered any. “They shouldn’t act like that and it won’t solve anything at all, destroying their own community,” she said. “However, no one has been listening and what they’ve been trying this far hasn’t worked,” she continued. Unknown to her, she depressed. My attention quickly turned to whereabouts of my wife and two children who use public transportation. I barely made the train and quickly texted my daughter and called my wife. The streets we passed countless times were descending into chaos and I greatly feared for their safety.

The things I remember most about the riots are connected to what you didn’t see on the CNN or MSNBC or FOX or local stations. What I remember about the riots is rooted in 35 years of calling a city your home, volunteering in her neighborhood associations to improve the place where your mother came with at the age of 3 from New York with
your old brother, Quddus. What I remember most is rooted in working as a program participant and then assistant at 1114 N. Mount Street Community Center in Sandtown-Winchester when I was 19 years old. Yes, this is same community where Freddie Grey was murdered, the death at the core of the unrest in Baltimore during the days leading up to and after April 27th. The program was a workforce development program aimed at helping youth ages 17 – 24 work with the Federal Highway Administration. Many of the youth still have those jobs today or used the skill set to step up. Craig Jernigan was the program director and before calling me to join the program, he recruited me a year earlier off the steps of 916 N Carey Street with the lure of food to join a program called Brother Helping Brothers. In attendance at the first meeting were Craig, Marvin, Kenny, Marshall, and Eddie. I would continue a relationship with them over the next couple of years and I still play basketball with Eddie.

After the emotions subsided, I remembered the 16 years of working trying to revitalize Baltimore’s urban neighborhoods. I wondered if the efforts were all in vain and how a public safety approach that uses technology was needed more than ever before. Any potential or current resident of Baltimore is going to question Baltimore’s public safety. Investors wanting to spend money on residential housing will require additional conditions, thereby, making it harder to invest in Baltimore’s inner neighborhoods. These experiences formed the foundation for my belief that a smart neighborhood approach was the missing element to revitalizing Baltimore’s inner core neighborhoods still suffering from failed urban policies of the past.
The primary topics and issues I’ll address are related to Baltimore City’s public safety and how that correlates with the investment of its inner cities. Underlining this issue is the question: would this increase in public safety lead to greater public and private real estate investment? In 1990 Baltimore City spent $130 million dollar trying to revitalize Sandtown. Unfortunately, the riots of April 2015 illustrated that almost 20 years later nothing much has changed. The riots were a response to Freddie Grey being arrested in Sandtown and his arresting officers charged with murder. Clearly, the $130 million spent was good but not sufficient.

My primary argument is that a smart city public safety approach would have ensured the dollars invested in Sandtown-Winchester achieved long term community revitalization. This point is made even clearer when you take into account the surrounding neighborhoods that didn’t have any concentrated private investments but improved during the same period. The Walbrook neighborhood in Baltimore’s Westside will serve as a case study for exploring these topics and issues. The neighborhood was affected by the recent unrest; the shopping stores along the 3001 block of North Avenue have already suffered from open air drug markets and their stores were looted during the recent unrest. The housing stock in the neighborhood is better than the rest of the city when measuring the number of occupied homes against vacancy. The neighborhood is also .25 miles from Coppin State and approximately 1 mile from Mondawmin. Both these entities have invested approximately $300 million into capital improvements over the last 8 years. The Woda Group, Inc., a national developer based in Westerville, OH, is developing residential housing on the 3000 block of North Avenue. A public safety approach that
uses smart city technology will enhance these nearby investments, spur future public/private partnerships, and provide Baltimore with the blueprint for how to revitalize its inner core communities into Smart Neighborhoods.
Literature Review
Our journey begins with a historical look at Baltimore land use and urban policies in Not in My Neighborhood: How Bigotry Shaped a Great American City,' by Antero Pietilais. Pietila spent seven years researching the people and stories in this account, which contains nearly 40 pages of notes. The reason I believe this book is critical is because of its historical look at Baltimore. Instead of using narratives to relay the story, Pietila uses legal records and covenants to illustrate how Baltimore became the segregated city that exist today where there are two Baltimore’s inhabited by individuals from vastly different social and economic backgrounds. Perhaps the most telling story takes place on McCulloh Street. According to Pietila, Baltimore's racial problems were exacerbated in 1910 when an African-American lawyer set up an office on McCulloh Street in a house he had bought from a white woman. Soon afterward, Baltimore enacted the first law in U.S. history to prohibit African-Americans from moving to white residential blocks and vice versa. Baltimore, though, used the force of law to "achieve systemic, citywide separation."

These policies created a three-tiered market that operated like a racially charged game of musical chairs. When Jews moved into a neighborhood, whites moved to outer areas. When blacks moves into a neighborhood, Jews moved to the outer areas occupied by whites. The migration of Jews and blacks proceeded north and northwest from the harbor to Ashburton, to Windsor Hills, to Gwynn Oak and Woodlawn. Later, Jews moved to Pikesville and the Reisterstown Road corridor up to Owings Mills and Reisterstown. Gentiles moved east toward York Road or north toward Carroll County. After the Rev. Martin Luther King Jr. was assassinated, Baltimore, like other cities, exploded. To
prevent an all-out race war, President Lyndon B. Johnson signed the Civil Rights Act of 1968 on April 11, which included provisions for fair housing. But by then, as Pietila vividly describes it, Baltimore - with its ugly racial and ethnic prejudices - had shown itself to be anything but Charm City.

Emily Lieb, “Row House City: Unbuilding Residential Baltimore 1940 – 1980” was very instrumental in informing my knowledge of Baltimore from the Civil War until 1980’s Baltimore. According to her thesis, Baltimore was a Southern state but its economy didn’t depend on it. Baltimore’s land use was shaped by Baltimore’s Inner Harbor serving as a key source of commerce for the city. This source of commerce drew black families to the city with ships of cargo constantly coming into its port. Baltimore created it’s the attraction for African American families to come in troves when it developed its economy. The city’s policies did not create the conditions for these newcomers to succeed but laid the ground work for Baltimore to remain a segregated city; a status that still exist today. Emily’s thesis also highlights other reports such as Across the Fallsway: A Social Study of Wards 5 and 10 in Baltimore, Maryland. Old Town and Poe Homes are the neighborhoods that highlight the dynamics of past decision making. Along with a small squadron of social workers and statisticians, Morton began her investigation of the neighborhood: 0.57 square miles that surrounded the Old Town alley district on the eastern edge of downtown. The oldest part of the district - Old Town, that is – predicated Thomas Poppleton’s 1823 city grid, and so its cramped streets, alleys, and mid-alley courts radiated every which way from Gay Street, which served as the neighborhood spine. It was crowded and held about 53,000 people per square mile, or
“5.2 times as many as there are in the city as a whole per square mile”- but it was not as crowded as other parts of the city, like the “Black Lung” sections of West Baltimore. In fact, census figures showed that for the past three decades, people had been moving out of the district, and the trend was accelerating. From 1920 to 1930, Ward 5 almost had lost 32 percent of its population, while Ward’s 10 populations had almost decreased by 10 percent. At the same time, the black population was growing. In 1900, almost 1,000 African Americans lived in the area, comprising 2 percent of the neighborhood’s total population; by 1930, about 13,500 African-Americans lived there, comprising 44 percent of the total population. Lieb pg. 29 – 31

During these years, Baltimore’s black population exploded but the number of neighborhoods where they could live by law or without racism dwindled. It’s important to note this included affluent blacks as well as poorer blacks. The statistic that I quote most often is what the Morton surveyors noted during their observation of what are the Edgar Allen Poe housing projects. The survey found the area’s worst conditions on the mostly African American alley blocks that surrounded the church’s Memorial Guild recreation center. There, more than 11 percent of the houses were vacant (three times as many as the city as a whole) and fewer than 10 percent were in good condition. In these streets and alleys, the researchers counted 420 baths and 970 toilets for 3,409 residents. Except for the segregated bathrooms in the churches and in the recreation center, almost all of the toilets were outdoors. Lieb pg. 31

What made the decisions truly detrimental to Baltimore’s growth and induced its decline were the land use patterns as a result of these policies. If you fast forward to present day
Baltimore, you can clearly see where these neighborhood existed. After realizing they needed to invest in black neighborhoods, Baltimore turned to urban renewal legislation to build public housing investments that were intended to develop better neighborhoods but instead became a recreation of the slums that existed previously. These developments would also have to be torn down and replaced with higher quality housing and amenities. Row House City clearly articulates how the decisions Baltimore made yesterday effects its future today.

Jane Jacobs, “The Life and Death of America’s Great Cities” (Random House 1961) gives us the modern definition of public safety. Chapter 2 the use of sidewalks: safety is the underlining theme for public safety by putting up against an important question: are the sidewalks safe for children to play and are eyes on the street? First, there must be a clear demarcation between what public space is and what private space is. Second, there must be eyes on the street, eyes belonging to those who might call the natural proprietors of the street. The buildings on a street equipped to handle strangers and to insure the safety of both residents and strangers, and must be oriented to the street. They cannot turn their backs on it and leave it blind. And third, the sidewalk must have users on it fairly continuously, both to add to the number of effective eyes upon the street and to induce people the people in the buildings to along the street to watch the sidewalks in sufficient numbers. Nobody enjoys sitting on a stoop or looking out a window at an empty street. Almost nobody does such a thing. Large numbers of people entertain themselves, off and on, by watching street activity. Lieb pg. 35
This is the basis for my definition of public safety and the concept for how to place eyes on the street in a more apathetic world than existed during Jane Jacob’s time period. It’s clear from the length of the chapter that Jacobs believes neighborhood sidewalks are ground zero for claiming a neighborhood. These sidewalks must be places where commerce occurs, people meander without fear, and children play under the watch of the entire neighborhood. I believe the reason Jacob’s work has sustained all these years is because there are lessons for low and high income neighborhoods. Regardless of the neighborhood, there are certain traits that must exist in order for the neighborhood “eco system” to be sustainable. The streets must not only defend the city against predatory strangers, they must protect the many well-wishing strangers who wish to use them, insuring their safety too as the pas through. Moreover, no normal person can spend his life in some artificial haven, and this includes children. Pg. 36

If Jane Jacobs were alive today, I believe she would agree with my strategy for community revitalization through public safety that uses smart city technology. I believe she would see the merit in a public safety approach that has her core values with a technological slant. As she states in her final chapter on the last page: Dull, inert cities, it is true, do contain the seeds of their own destruction and little else. But lively, diverse, intense cities contain the seeds to their own regeneration, with energy enough to carry over four problems and needs outside themselves.

The report Sandtown-Winchester—Baltimore’s Daring Experiment In Urban Renewal: 20 Years Later, What Are the Lessons Learned written by Stefanie DeLuca,
Johns Hopkins University and Peter Rosenblatt, Loyola University Chicago and study was an important piece of literature because it asks the central question: what happened to the $130 million that was invested in Sandtown-Winchester? This community is where Freddie Grey was arrested; an incident that set off a chain of events that culminated in the April 2015 riots. Prior to the riots, this neighborhood received a lot of attention when Mayor Kurt L Schmoke and James Rouse came together to marshal public and private resources to revive a 72 square block community in West Baltimore. The report outlines the gains and losses from this multiyear and multi-million dollar initiative. The reason I value the piece in my paper is because it’s not written with a slant and is an in depth look at the intense effort that went into to revitalize Sandtown-Winchester and why the promise didn’t match the reality afterwards.

The transformation began in the later 1980s with a plan to construct 223 new houses for low-income homeowners. Former President Jimmy Carter was on hand in 1992 as Habitat for Humanity announced that it would renovate 100 vacant homes in the area, a pledge that was fulfilled in 1998. Almost 600 units of public housing in Gilmore homes were modernized in the early 1990s. Mayor Schmoke also pledged to renovate 600 vacant houses in the neighborhood within one year, although this timeline proved overly ambitious—in 1996, the Sun reported that the city was only beginning to make good on its pledge. Mayor Schmoke also pledged to renovate 600 vacant houses in the neighborhood within one year, although this timeline proved overly ambitious—in 1996, the Sun reported that the city was only beginning to make good on its pledge. Funding for further development came in 1997, when Sandtown was selected as one of six neighborhoods in the country to receive a $5.2 million federal “homeownership zone” grant from the Department of Housing and Urban Development. This grant attracted another $30 million in public and private funding, and in 2000, the enterprise Foundation began selling renovated and newly built homes to first-time homebuyers. Pg.1
The study also highlights the workforce development initiatives that took place in harmony with the physical redevelopment. On the health front, the Vision for Health Consortium (VFH), made up of staff from established Baltimore hospitals including Bon Secours, the University Of Maryland School Of Nursing, and the Baltimore City Health Department, undertook a number of initiatives to improve resident well-being. Door to door visits and case management were undertaken to reduce infant mortality in the neighborhood, and in 1998 the VFH began substance abuse treatment and prevention.

What was most intriguing about the report was the comparison with the neighborhood that did not receive funding, Upton and Penn North/Reservoir Hill respectively. Although they didn’t have a concentrated investment, they experienced similar socioeconomic investment. The other less notable highlight: they didn’t have a public health and safety objective.

Loren Siegel, Robert Perry, Margaret Hunt Gram from the New York Civil Liberties Union elevated the opportunities and challenges when discussing public safety through a smart city lens and CCTVs in its report: Who’s Watching? Video Camera Surveillance In New York City and the Need for Public Oversight. The report elevated the growth of New York closed circuit TV’s that are attached to private and public buildings. The report was told as a cautionary regarding the unintended consequences associated with being achieving public safety through technology. The report influenced my policy and Smart
Neighborhood recommendations so they we measured and thought about “who watching”.

Barbara B Brown, Douglas Perkins, and Graham Brown provided with the study on how incivilities such as litter, graffiti, and unkempt homes leads to crime as criminals feel emboldened to commit offences as the feel the residents will not address the situation in their report: *Incivilities, place attachment and crime: Block and individual effects*. Their report studied 66 Baltimore neighborhoods and learned that incivilities such as trash, unkempt lawns and homes led to crime. This was an important piece with helping highlight my definition of public safety so that it includes abandoned houses, illegal dumping along with crime deterrence and solving.

IBM’s Smarter Cities Challenge case studies were the primary information source for learning the best practices and promising approaches for Smart Cities and the ways to develop a Smart Neighborhood. Their Brazil and New York work was instrumental when developing a practical that could actually be implemented in Baltimore’s Walbrook neighborhood. They also performed work in Baltimore that served as the foundation for understanding how I could integrate my Smart Neighborhood policy and approach into the City’s current framework.

The literature reviewed for this paper revealed the multiple ways our urban environment is changing; it also highlighted how many of the same concerns such as public safety and economic development still matters. People will always desire to live in safe neighborhoods with good schools. However, the key takeaway was the various usages for
technology in the environment and how this is leading to innovative ways for revitalizing cities like Baltimore, MD.
Research Methodology
The research methodology consisted of reviewing the primary and secondary literature in the newly emerging field of “smart city” or “intelligent city” technologies with a concentration on public safety. The case studies that formulated my smart city approach came from IBM’s work national and international work with Smart Cities. Particular focus was paid attention to the challenges and opportunities associated with integrating these new technological strategies. The research methodology also included the development of a candidate neighborhood case study in Baltimore, MD. Primary research included almost 8 years of interviews with neighborhood representatives, public officials and IT industry representatives working in Baltimore. These representatives from neighborhood-based and community-based organizations were an invaluable source of information. Surveys were conducted with neighborhood associations in the Walbrook and Penn North communities where some of the unrest took place on April 27th, 2015. The questions explored centered on privacy concerns residents may have regarding “big brother” always watching and residents/businesses willingness to incur added cost. Housing trends, historic data, case studies, best practices, and challenges facing Baltimore City will be highlighted and analyzed through geo-spatial mapping. Since the Mayor Office of Information Technology is already monitoring certain areas in real time with their Citistat and Citiwatch programs. The questions I asked concerned Baltimore’s Citiwatch Program, a city program that lets private home owners place video cameras outside their property and connect them with police monitoring; however, the cameras are not monitored in real time. Analyst Ann Moxie at Nucleus Research was also interviewed regarding Nucleus’ research with Kana in the City of Buffalo. The city of
Buffalo deployed LAGAN Enterprise from KANA, part of Verint, to utilize analytics capabilities for its Operation Clean Sweep program. Nucleus found that the solution enable the city to leverage its preexisting data to pinpoint targeted areas, helping the city to deploy resources more effectively. They were able to realize a 512% rate of return in 2.4 months and an average annual benefit of $2,455,237. Nucleus also studied the City of Lancaster, California needed to gain greater visibility into where Part I crimes were occurring and where they were expected to occur in the near future. By using IBM SPSS to develop predictive models for crime prevention, the City of Lancaster saw a crime rate reduction of over 35 percent compared to its benchmark crime rate measured in 2007. (See Chapter 3 Smart City Revolution complete case analysis). The primary cost benefit came from avoiding new hires, increasing working productivity with the technology, and being more precise with the deployment of resources. The research did not support this happening across all areas; however, it elevates the point of how technology can have a double bottom line that’s cost effective and achievements maximum results.
Chapter 1: Baltimore’s Urban Decline and Revitalization
The Baltimore neighborhoods that serve as case studies in this document are Sandtown-Winchester (Sandtown), Upton, Penn-North, and Walbrook. Sandtown was revitalized in 1990 by Baltimore City with approximately $130 million dollars in public/private funding while Penn-North and Upton didn’t undergo the same intense revitalization efforts. As this paper will highlight, 20 years later, there is little difference between these neighborhoods today. This elevates the reason why a public safety approach that uses smart city technology should be piloted to enhance the public private investment in Walbrook and is the missing element when revitalizing Baltimore’s inner cities.
A historical look at these neighborhoods explains how they became places that required revitalization. In 1860, there had been around 25,000 black people in Baltimore, 2,000 were slaves. In 1880, there were nearly 54,000; in 1890, there were more than 70,000. Another 10,000 arrived between 1890 and 1900. In all, between 1870 and 1900, African-Americans comprised about 20 percent of the city's population. Between 1910 and 1920, Baltimore's black population grew by 28 percent. At the end of the decade, it had more black people than any city except Chicago, New Orleans, and Washington, D.C. By then, the first "Great Migration" of African-Americans from the rural south to the urban north was well underway, and industrial cities from New York to Los Angeles had begun

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to experience the kind of race-based sorting that had been underway in Baltimore for decades.²

Figure 11: Baltimore's Segregation: 1970. The red dots represent a pattern that still forms Baltimore’s social and economic dynamics. Source: Wall Street Journal

During this same time period suburban Baltimore and Anne Arundel counties would gain more than 300,000 people.³ The trend was set in place – Baltimore would become poorer as measured by household income, less economically viable due to the loss of business and taxes, less resourced as a result of segregation, social ills seeped into educational

² Ibid.,
³ Ibid.,
underachievement, stable family environments eroded more sharply, drug and crime addiction increased.

**Figure 12:** Baltimore's Segregation: 2010 Source: Wall Street Journal. The comparison from Fig. 4 shows how Baltimore's segregation practices are still evident.

The impacts of these conditions would have negative impacts on education, health, and families as well. The psychological and physical impacts of segregation took its toll on urban Baltimore; between 1950 and 1960, it lost 113,000 white, typically middle class people. Meanwhile, Baltimore’s black population increased from 225,000 to 328,600 and
the city’s total population dropped from 723,700 to 610,400. This also brought the legacy of Jim Crow, and white citizen’s fears about what it meant to live beside blacks. Additionally, Blacks were denied economic opportunity and therefore every Black that came to Baltimore was forced to enter into an inferior economic status, regardless of their occupation or monetary value. This time period in Baltimore City’s history predetermined where African-Americans would live and its housing policy created the conditions such as lack of plumbing infrastructure, for slums to exist. Decisions made by public officials during this time period ensured blacks were second class citizens. The maps illustrate Baltimore’s the effects of racially segregated demographic patterns and their long term effects on Baltimore. The data elevates how Baltimore’s past created impoverished neighborhoods are characterized by neighborhoods where families of four earn between $10k and $25 annually. These issues are multi-generational, inextricably intertwined, and originated due to the exclusion of Baltimore early population from economic opportunities. The PBS Documentary: Race the Power of an Illusion, Part 3, elevates the connection between these variables in its televised special on how Roosevelt's New Deal reforms that offered many Americans a path out of poverty but excluded its African Americans citizens. The original social security program excluded farm workers and domestics, most of whom were non-white. And many unions locked Blacks and Mexicans into low paying jobs, or kept them out altogether. The best example of how European ethnics would finally gain the full benefits of whiteness, to the exclusion of others, would come with an innovation in housing at the end of World War

\footnote{Ibid.}
II. It was a time when hundreds of thousands of GIs came home ready to start families, but had no place to live. According to realtors from that time period, living space was at a premium. FHA came to the rescue by insuring long term, low monthly payment mortgage loans. Home ownership was made possible for additional millions of families and stimulated a tremendous volume of construction. When veterans needed homes for families they turned to the revolutionary New Deal housing program. In the 1930's the federal government created the Federal Housing Administration, whose job it was to provide loans or the backing for loans to average Americans so they could purchase a home. In order to purchase a house in America prior to 1930s, you had to pay 50 percent of the sales price up front. The new terms of purchasing a home was that you put 10 percent or 20 percent down, and the bank financed 80% of it— not over five years but over 30 years at relatively low rates. This opened up the opportunities for Americans to own homes like ever before. This is essentially the same financing pro forma that allows most Americans to own their homes today. However, the FHA underwriters warned that the presence of even one or two non-white families could undermine real estate values in the new suburbs. These government guidelines were widely adopted by private industry. Race had long played a role in local real estate practices. Starting in the 1930's, government officials institutionalized a national appraisal system, where race was as much a factor in real estate assessment as the condition of the property. Using this scheme, federal investigators evaluated 239 cities across the country for financial risk. When the white residents of Eight Mile Road in Detroit were told they were too close to a Black neighborhood to qualify for a positive FHA rating, they built this six foot wall
between themselves and their Black neighbors. Once the wall went up, mortgages on the white properties were approved. Between 1934 and 1962, the federal government underwrote 120 billion dollars in new housing and less than 2% went to non-whites.\(^5\)

**Figure 13:** Baltimore's income demographic maps show how segregation practices formed the city's social and economic landscape.

These policies created the perception of Baltimore then and now. In April 1968 racism shaped the way that people interpreted the built environment and trained white people to believe that integration was a threat to "their status, their pocketbooks, and ultimately their way of life. And now you could include their safety."\(^6\) In April 2015 that legacy of

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\(^6\) Lieb, Row House City: Unbuilding Residential Baltimore, 1940-1980
racism and the failure of American society to remedy it enforced the views Baltimore had trying to get rid of since 1968. The effects of racism and segregation were the key catalyst for creating the Baltimore we see today; it’s also the key barrier towards its revival in the creation of its ghettos from the late 1890’s until 1960’s. This time period laid the foundation for Baltimore City’s future urban plans, created its current grid, and nurtured the social and economic decay that still exist today. Unfortunately, Baltimore history, like other African American cities, is also a lesson on how entrenched these policies are Baltimore’s city streets, housing, schools, health, and national fiscal policy. The underlining theme I want to reiterate is that Baltimore’s past policies along with the 1968 and now 2015 riots left an indelible mark on its core inner neighborhoods as an unsafe place to experience a high quality of life, real or perceived, this stigma exasperates its greater social and economic challenges and opportunities. As previously stated, the purpose of this paper is not revisit Baltimore’s history and how the population became so restless that it resulted in violence in a major American city; the purpose is to learn what strategies have been employed to create socioeconomic change in Baltimore’s disinvested neighborhoods, why they fell short of their goals, and what new public safety smart city strategies are needed to turn the curve to holistically revitalize Baltimore’s inner core neighborhoods.
Chapter 2: Sandtown-Winchester: Research Findings from Past Revitalization Initiatives
This May 2015 Time magazine cover suggests nothing has changed since the civil rights movement in America 50 years ago; it shows a man running from the police in the middle Baltimore riots. Aspiring photographer Devin Allen's image is in black and white with the headline "America, 1968" -- only the year has been crossed out and replaced with "2015." Baltimore saw riots and looting in April 1968 after Martin Luther King Jr. was assassinated. Business Insider reports 6 people died, 700 were injured, and more than

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7 Geoff, Herbert. Time magazine cover on Baltimore riots suggests nothing's changed since '60s. Syracuse.com. Syracuse, NY, April 30, 2015.
"We never really recovered from the riots of 1968," Baltimore City Council president Jack Young told Time. "Our infrastructure was destroyed: butcher shops, clothing stores, supermarkets, all destroyed for one reason or another." Cut to April 2015, when 25-year-old Freddie Gray died while in police custody. After his funeral Monday, protests erupted with accusations of police brutality and stores were robbed, cars were set on fire and cops were injured.

Baltimore City’s Sandtown-Winchester is the primary case studies I’ll use to illustrate how ensuring public safety is the necessary piece to revitalizing Baltimore’s neighborhoods. In Sandtown, millions of dollars were been dedicated to community revitalization efforts but persistent problems such as open air drug dealing, violence crimes, and poverty are still prevalent. The purpose in sharing this example is to highlight my “good but not sufficient” premise. In all fairness, smart city technology was

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8 Ibid.,
9 Ibid.,
10 Ibid.,
11 Ibid.,
12 Ibid.,
not around during the redevelopment of Sandtown; however, there are similar neighborhoods such as Greater Mondawmin/Walbrook undergoing similar revitalization efforts and my argument is that these initiatives require a public safety smart city approach to be accomplish their revitalization goals.

Sandtown- Winchester Case Study

Figure 16: Map of Sandtown Winchester – Credit A. Price

Today, the 72 block neighborhood is part of a section of West Baltimore in which about half the children live below the poverty line, nearly a quarter of adults are out of work, and the homicide rate is more than double the citywide average; it is home to about 8,500
people today, which is down from nearly 11,000 in 1990.\textsuperscript{13} In 1989 developers, religious and community leaders, nonprofit organizations, and elected officials, implemented a decade long initiative to revitalize the neighborhood. The transformation began in the latter 1980s with a plan to construct 223 new houses for low-income homeowners.\textsuperscript{14} Habitat for Humanity announced it would renovate 100 vacant homes in the area and 600 units in Gilmore Homes were modernized in the early 1990s.\textsuperscript{15} In 1997 Sandtown was selected as one of six neighborhoods to receive a $5.2 million federal “homeownership zone” grant from the Department of Housing and Urban Development.\textsuperscript{16} This grant attracted another $30 million in public and private funding. In 1994, the community established a “Compact Schools” agreement to increase student achievement in three elementary schools in the neighborhood.\textsuperscript{17}

\textsuperscript{13} Wenger, Yvonne, Saving Sandtown-Winchester: Decade Long, multimillion-dollar investment questioned (Tribune Content Agency May 10, 2015) pg. 1

\textsuperscript{14} DeLuca, Stephanie and Rosenblatt, Peter, Sandtown-Winchester-Baltimore’s Daring Experiment In Urban Renewal: 20 Years Later (The Abell Report November 2013, Volume 26, Number 8) Pg. 1,2

\textsuperscript{15} Ibid., 1.

\textsuperscript{16} Ibid., 2.

\textsuperscript{17} Ibid., 2.
The reforms also extended to health with the inception of the “Neighborhood Transformation Initiative” that employed residents in community improvement jobs, such as health outreach workers, and family and youth counselors.\textsuperscript{18} In 1996, Sandtown Works began job readiness training and placement services to teens and adults in the neighborhood, and the following year Jobs Plus was established to provide employment services to residents of Gilmore Homes.\textsuperscript{19} In 1993, Sandtown was included in Baltimore’s empowerment zone”, a Clinton-administration program that provided tax credits to employers who hired local residents from the area.\textsuperscript{20} The Vision for Health consortium (VFH), made up of staff from established Baltimore hospitals including Bon Secours, the University Of Maryland School Of Nursing, and the Baltimore City Health Department implemented programs aimed at reducing infant mortality and substance abuse.\textsuperscript{21} The neighborhood transformation spurred residents, local government officials, and private developers to overcome what James Rouse, the philanthropist who contributed ongoing financial support, referred to as the “great American failure in the

\textsuperscript{18} Ibid., 1. 
\textsuperscript{19} Ibid., 3. 
\textsuperscript{20} Ibid., 
\textsuperscript{21} Ibid.,
United States to recognize the deplorable conditions of inner city neighborhoods and come together to do something about them.\footnote{22}

\textbf{Figure 18: Investment in Sandtown Questioned Data - Emma Patti Harris}

The report by Stephanie DeLuca and Peter Rosenblatt: Sandtown-Winchester-Baltimore’s Daring Experiment In Urban Renewal: 20 Years Later compared three “control neighborhoods that were similar to Sandtown-Winchester, the Penn North/Reservoir Hill neighborhood just to the north of Sandtown-Winchester, and the Greenmount East neighborhood in east Baltimore.\footnote{23} These control neighborhoods did not take part in the Sandtown transformation initiative, but they were other very low income, racially segregated neighborhoods that were facing similar social and economic challenges in the 1980s and 1990s.\footnote{24} This analysis allows us to compare and contrast and

\begin{footnotesize}
\begin{itemize}
\item \footnote{22} Ibid., 1,2.
\item \footnote{23} Ibid., 3.
\item \footnote{24} Ibid.,
\end{itemize}
\end{footnotesize}
imagine what would have happened if the revitalization effort never occurred. These neighborhoods were all much poorer and more segregated than the average city neighborhood, were similar in geographic size to Sandtown, had median incomes well below the citywide average, and double digit unemployment rates. Greenmount East was the most similar to Sandtown-Winchester in 1990, Upton was worse, and Penn-North/Reservoir Hill was slightly worse off than Sandtown.

Figure 19: Baltimore Neighborhoods Map - Andrew Zaleski

Greenmount East, which did not have a comparable neighborhood transformation strategy, saw a similar drop in poverty during both the 1990s and 2000s, although the

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25 Ibid.,
26 Ibid.,
27 Ibid.,
neighboring Upton community did not.\textsuperscript{28} Penn-North/Reservoir Hill had an even greater drop in poverty rate during the 2000s, down to 23% poor by 2009.\textsuperscript{29} Other measures of neighborhood socio-economic data also improved in Penn-North, which saw greater gains in the median income and the number of high school and college graduates than Sandtown in both the 1990s and 2000s.\textsuperscript{30} Upton and Greenmount East had comparable proportions of high school and college graduates as Sandtown in both 2000 and 2009.\textsuperscript{31} The median income in these neighborhoods lagged behind Sandtown Winchester.\textsuperscript{32} While the unemployment rate also increased in Upton and Penn-North/Reservoir Hill since 1990, Sandtown-Winchester was the only neighborhood of the four that saw an increase in unemployment during the 2000s.\textsuperscript{33} By 2009, Sandtown had a slightly higher unemployment rate than any of the three comparison neighborhoods.\textsuperscript{34} The case study of Sandtown’s revitalizations most compelling takeaway is that despite not having the same kind of intensive community transformation efforts as Sandtown, the Greenmount East neighborhood saw similar declines in poverty, and by 2009 was still comparable on a number of selected census measures to Sandtown, including home ownership.\textsuperscript{35}
My theory of change regarding a public safety smart city approach as the key element was echoed by Mayor Kurt L. Schmoke when he stated that some of the problems afflicting Sandtown never disappeared.36 “It was a real challenge, because you had high levels of poverty in an area that had a significant infiltration of street-level drug dealers, Schmoke said.37 In dealing with issues like that, you have no final victories, and you have to have people coming behind you to build upon the work.”38 Put another way, Baltimore City never realized the full impact of its failed policies of the past of what it would actually take to revitalize an urban neighborhood.

According to the report, Sandtown-Winchester-Baltimore’s Daring Experiment In Urban Renewal: 20 Years Later crime and policing programs were not as central to the have been affected by the other reforms as residents became more empowered by the Neighborhood Transformation Initiative.39 Data shows changes in reported crime per 1,000 neighborhood residents for Sandtown-Winchester, the three comparison neighborhoods, and Baltimore city as a whole; it also highlights how the overall crime

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36 Ibid.,
37 Ibid., 7
38 Ibid.,
39 Ibid.,
rate declined across the city during the 2000s. The crime rate in Sandtown-Winchester was very close to the Baltimore average, as was the crime rate in Greenmount East and Penn North/Reservoir Hill and only Upton had a markedly higher rate of crime during this period, although it declined by more than half between 2000 and 2009. When you look at the overall life expectancy in each neighborhood, as calculated by the Baltimore City Health Department, its figure provides a way to understand the quality of life in a Neighborhood by looking at how long residents live on average, compared to the city as a whole. Data from 2008 and 2011 are presented as a comparison and all four comparison neighborhoods had shorter life expectancies than the city average. Upton, with a life expectancy eight to nine years lower than the city average, had the lowest of any neighborhood in the city. Sandtown was not much better off, with an overall life expectancy of around 65 in both 2008 and 2011, six to seven years shorter than the city average.

In my viewpoint, the biggest lesson learned from Sandtown is that public health and safety strategies should be a key part of any revitalization strategy. I believe that smart city technology would have allowed Sandtown-Winchester to maintain its gains while garnering public and private partnerships. Imagine if the part of the $130 million dollars of public/private investment also went to smart city public safety infrastructure. These developments have multiple bottom lines as they allow the community to be safe while

40 Ibid., 41 Ibid., 42 Ibid., 43 Ibid., 44 Ibid., 45 Ibid., pg. 8
sustaining the investments in new housing and community and supportive services that have been unable to turn the curve by themselves. As we’ll see in the next chapter, public safety incivilities, invites nefarious elements to feel emboldened, which results in higher crime. While crime is a primary target for public safety, it also includes elements of health, code enforcement, sanitation, and emergency response, which are symbolized in Baltimore by dilapidated residential and commercial structures, illegal dumping in alleys, and open air drug markets. These elements feed off each other and it’s my argument that a smart city public safety approach is the missing element to either independently of jointly enhance current and new community development initiatives.
Chapter 3: Smart City Revolution
It’s my argument that a public safety approach was the missing element in maintaining the gains from the $130 million initiative and leveraging additional resources. Public safety is defined as more than simply keeping people safe; it also means creating the physical conditions for revitalization to occur. This is especially true since there is a growing school of thought of the connection between crime and physical incivilities or what I have referred to as public safety; these include: unkempt lawns and litter. There is data that shows areas with multiple physical “incivilities,” such as litter, graffiti, broken windows, unkempt lawns, and homes in disrepair, suffer consequences beyond those of the immediate physical decay and disorder. As of 2014, Baltimore had approximately 16,000 vacant homes. Incivilities are hypothesized to become important symbols that residents and others cannot or will not protect their neighborhoods from crime and fear. It is further believed that residents react to the symbolism of these incivilities by withdrawing from social

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47 Alana Semuels, “Could Baltimore's 16,000 Vacant Houses Shelter the City's Homeless?”(The Atlantic October 2014), pg. 1.
activity in the neighborhood. The map above depicts the number of vacant row houses in Baltimore City, which if you overlay it with the maps of Baltimore City are predominantly in its low-income African American communities such as Upton and Sandtown. Criminals also interpret these physical cues to mean that residents, through fear or apathy, have lost control over the neighborhood and will not interfere with criminal activity. Baltimore was one of the few places where this correlation was actually tested. In 66 Baltimore neighborhoods, physical incivilities correlated with police reports of serious crimes and neighborhood incivilities in Baltimore predicted the increases in police reports of homicide but not robbery, assault, or rape. Neighborhood

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49 Ibid., 360.
50 Ibid.,
51 Ibid.,
52 Ibid., pg. 362
litter predicted quality of life crimes such as drug dealing and harassment. This data supports my argument that smart city technology can increase public safety and lead to housing and economic development in Baltimore City.

This paper will later illustrate how a smart city public safety strategy can be piloted in Baltimore’s Greater Rosemount and Mondawmin Area. The neighborhood has seen $350 million dollars of investment in public and private investment over the past 5 – 7 years but is still on at a “tipping point” because of its open air drug market and blighted housing stock. In order to understand the smart city concept, we must first understand smart city technology for public safety movement and how cities such as New York, Chicago, and Brazil have pioneered Smart City technology geared towards public safety.

According to the Smart Cities Council, a smart city gathers data from smart devices and sensors embedded in its roadways, power grids, buildings and other assets. It shares that data via a smart communications system that is typically a combination of wired and wireless. It then uses smart software to create valuable information and digitally enhanced services. According to ABI Research, smart cities technology is an $8.1 billion market today and in five years, the market will grow to almost five times that size, reaching $39.5 billion. Pike Research forecasts that investment in smart city technology infrastructure will total $108 billion during the decade from 2010 to 2020. The Smart

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53 Ibid., pg. 362
55 Ibid.,
56 Ibid.,
57 Ibid.,
58 Ibid.,
2020 report is even more bullish, claiming the related technologies and industries will grow four-fold to become a $2.1 trillion market by 2020.\textsuperscript{59}

\textbf{Smart City Best Practices: Public Safety}

One of the main emphases of this paper is exploring how smart city technology can increase public safety towards revitalizing Baltimore’s inner neighborhoods. Public safety technology provides a good frame for understanding smart city technology, which can be placed into 2 primary categories – soft (computer software, information systems) and hard (hardware or materials).\textsuperscript{60} Hard technology innovations include new materials, devices, and equipment that can be used to prevent and control crime.\textsuperscript{61} We increasingly see hard technologies intended to prevent crime – the ubiquitous CCTV cameras, metal detectors in schools, baggage screening at airports, bullet proof teller windows at banks, and security systems at homes and businesses.\textsuperscript{62} Soft technologies involve the strategic use of information to prevent crime (e.g. the development of risk assessment, and threat assessment instruments) and to improve the performance of the police (e.g. predictive policing technology, and recording/video streaming capabilities in police vehicles).\textsuperscript{63} Soft technology innovations include new software programs, classification systems, crime analysis techniques, and data sharing/system integration techniques.\textsuperscript{64}

\textsuperscript{59} Ibid.,
\textsuperscript{61} Ibid.,
\textsuperscript{62} Ibid., pg18.
\textsuperscript{63} Ibid.,
\textsuperscript{64} Ibid.,
Rio de Janeiro: Integrating City Agencies

*Rio de Janeiro*, a city of 6 million and burdened with failing infrastructure and high crime turned to IBM to help it prepare for the 2014 FIFA World Cup and 2016 Olympics. IBM helped them with response coordination, increase transportation, improve service for citizens, and integrate 30 agencies into one command center that gathers data across city sectors to respond to problems quickly; sensors and video feeds produce real-time maps and graphs that’s transmitted to patrol officers who work to predict crimes and counteract them. As a result, Rio improved response time by 30 percent.

The new *Operations Center (Pictured Above)* in Rio provides the incident commander and responders with a single, unified view of all the information that they require for situational awareness. The mission of the Rio Operations Center is to consolidate data from various urban systems for real-time visualization, monitoring and analysis. The
system was designed initially for forecasting floods and related emergencies, but it is extensible to any event occurring in the city.

![Figure 24: The I.B.M. executive Guru Banavar in the command center that the company designed for the city of Rio de Janeiro. The center gathers data from 30 agencies, helping the city coordinate their work. Credit Andre Vieira for The New York Times](image)

The Center will enable city leaders to make decisions in emergency situations based on real-time information. This is the first center in the world that will integrate all the stages of a crisis management situation: from the prediction, mitigation and preparedness, to the immediate response to events, and finally to capture feedback from the system to be used in future incidents. At the time, Rio had its hands full with everyday issues that were already taking a toll on the city. Its infrastructure was aging, crime was on the rise and the capacity to effectively respond to natural disasters such as floods was hampered by scattered and isolated municipal agencies. To fix all of this for its six million citizens, Rio

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needed to transform and it needed to get smarter. After the command center was built, the city set up a high-resolution weather forecasting and hydrological modeling system — which can predict heavy rains as much as 48 hours in advance. Transportation issues can be better monitored through real-time data culled from sensors and video cameras. Most important, Rio needed to better predict and coordinate its response to emergency incidents. In a city that’s prone to flash floods that was critical.

There are similarities between how Brazil handled its public safety challenges and Baltimore. Brazil transformed its infrastructure so that operations can respond in real time. They also expanded the use of the smart city technology to include emergency services. This allows for them to reap more benefits from their initial investment.

New York City Real Time Crime Centers

Figure 25: New York City’s Real Time Crime Center Source: IBM.com

67 Ibid.,
68 Ibid.,
69 Ibid.,
**New York City**: A man robs a midtown pizzeria at gunpoint, but not without the manager seeing his Sugar tattoo. Instead of the police having limited search queries and data bases in different locations and formats, they have the *Real Time Crime Center*, which gets information and investigative report to offices investigating violent crime. The RTCC provided the information to detectives in the pizzeria case and it gave them his address. The suspect was apprehended hours later. There are three core components of the Real Time Crime Centers: ⁷⁰

- **Data Warehouse**: For the data warehouse, the NYPD worked with IBM Global Services, to create a single front-end access point for some of the department's own homegrown applications.

- **Data Analysis**: The NYPD turned to Dimension Data, a solutions provider based in Hauppauge, New York, to implement data mining and analysis products to help the RTCC staff use the massive amount of raw information available.

- **Data Wall**: The RTCC's core is a room with a two-story video wall composed of 18 connected Mitsubishi TV screen panels and 25 desks, manned by more than 40 detectives and crime analysts. The NYPD hosts its own data centers and uses a backup center to provide redundancy.

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The engine driving New York’s real-time crime center is its data collection. The primary sources for data collection are captured by closed-circuit television (CCTV), also known as video surveillance, which is the use of video cameras to transmit a signal to a specific place, on a limited set of monitors. The New York Civil Liberties Union issued a report to ask discussions about the critical questions that have yet to be asked by city officials regarding the rapidly growing number of surveillance cameras. Their 1998 study identified 2,397 video surveillance cameras visible from street level in Manhattan. Seven years later nearly that same number of surveillance cameras was counted in just one area of lower Manhattan that comprises Greenwich Village and SoHo. A 2005 survey found 4176 cameras below Fourteenth Street, more than five times the 769 cameras counted in that area in 1998. Two hundred and ninety-two surveillance cameras were spotted in central Harlem, where cameras literally line 125th Street on both private and public entities.

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72 Ibid., 2.
73 Ibid., 2
74 Ibid, 2.
The New York City Police Department, spurred by the promise of $9 million in Federal Homeland Security grants and up to $81.5 million in federal counter-terrorism funding, announced this year that it plans to create “a citywide system.”\footnote{Ibid.,}
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<td><strong>District 2 (Greenwich Village, SoHo)</strong></td>
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<tr>
<td><strong>Central Harlem</strong></td>
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<td><strong>Total</strong></td>
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Table 1: New York CCTV Count - Source: New York Civil Liberties Union

In 2006 the City Council introduced a measure to mandate private entities install video surveillance cameras.\(^{76}\) In Harlem, virtually every step taken on 125th Street in Central Harlem is captured on a video surveillance camera, as are many activities at several large public housing projects in the area. In testimony before the New York City Council in 2006, the commanding officer of the police department’s Technical Assistance Response Unit claimed that the department’s Video Interactive Patrol Enhancement Response (VIPER) program, a collaboration between the NYPD and the New York City Housing Authority that operates 3,100 monitored cameras in fifteen public housing buildings. The cameras were installed in 1997 and have been given credit for the monitored buildings experiencing 36 percent less crime on average than in the year before installation.\(^{77}\) The

\(^{76}\) Ibid.,

\(^{77}\) Ibid, 5.
report also offered five ways to successfully implement a smart city approach to increase public safety, which included the following:

1. SCOPE AND PURPOSE. The city must establish specific and justifiable objectives for its video surveillance programs. In order to identify and meet these objectives, the city must also undertake a needs assessment audit prior to installing video surveillance cameras. Following their installation, there must be periodic audits to evaluate the effectiveness of surveillance cameras, as well as compliance with laws and regulations governing operating procedures.78

2. PUBLIC NOTICE. The city should provide the residents of neighborhoods and communities in which the city intends to install video surveillance cameras the opportunity to participate meaningfully in decisions regarding the location and operation of the cameras.79

3. TRAINING AND SUPERVISION OF PERSONNEL. Personnel charged with operating video surveillance cameras or controlling access to such cameras or to video footage must be properly trained and closely supervised.80

4. STORAGE AND RETENTION. The city must establish clear rules and procedures for retention, storage and destruction of video surveillance images, and for access to and dissemination of such video images.81

5. PROHIBITIONS AND PENALTIES. The city must explicitly prohibit unlawful video surveillance camera practices, and prescribe penalties for violators.82

78 Ibid, 13.
79 Ibid.,
80 Ibid.,14.
81 Ibid., 15.
These findings serve as the core principles for how to implement my recommendations for implementing a smart city geared towards public safety approach in the Walbrook Neighborhood of Baltimore. Another case study that illustrates the merit of smart city technology’s economic benefit is the City of Lancaster California. Lancaster used smart city technology when it realized it needed to gain greater visibility into where Part I crimes were occurring and where they were expected to occur in the near future. By using smart city technology to develop predictive models for crime prevention, the City of Lancaster saw a crime rate reduction of over 35 percent compared to its benchmark.

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82 Ibid., 16.
83 Nucleus Research Report m153 - IBM SPSS, “ROI Case Study: City of Lancaster”, (Copyright 2012 Nucleus Research Inc.), 1.
crime rate measured in 2007.\textsuperscript{84} Lancaster started its predictive analytics approach to fighting crime by hiring James Kobolt as its first Senior Criminal Justice Analyst in January of 2008 to analyze data, provide recommendations, and identify new programs focused on reducing crime.\textsuperscript{85} There were initial problems with creating the algorithms so Mr. Kobolt had to create models that were more accurate and useful, including a time-series analysis of crime going back to January 2000 and by June of 2010.\textsuperscript{86} By hiring the correct resources, acquiring predictive and location-based analytics software, setting up the data appropriately, and getting internal buy-in, Lancaster developed a new data-driven crime prevention model that helped reduce the crime rate by over 35 percent.\textsuperscript{87}

Lancaster worked with Nucleus Research to determine the economic benefits.\textsuperscript{88} Nucleus is the only provider of case-based technology research that delivers the insight, benchmarks, and facts that allows its clients to make the right technology decisions.\textsuperscript{89} Their research approach builds on in-depth assessments of actual deployments allowing our analyst to provide technology advice built on real-world outcomes, understand how

\textsuperscript{84} Ibid.,
\textsuperscript{85} Ibid., 2.
\textsuperscript{86} Ibid., 3.
\textsuperscript{87} Ibid.,
\textsuperscript{88} www.Nucleusresearch.com
\textsuperscript{89} Ibid.,
financial decision makers think and help them build the business case for technology. Nucleus’ research approach follows the same methodology used by accountants and financial professionals and they are the only firm registered by the National Association of State Boards of Accountancy. Since 2000, their analysts have blended technology with a financially focused investigative research approach to deliver quantitative analysis and support.

When Nucleus worked with Lancaster they calculated the changes in Part I crime between the initial pre-analytics crime rate in 2007 of 449.4 crimes per 10,000 residents and the crime rate after predictive analytics were fully implemented. Lancaster saw a 35 percent reduction in 2010 and a 42 percent reduction in 2011 compared to the original 2007-benchmark rate. This additional benefit resulted in over $800,000 value in the partial year of 2010 when predictive analytics were implemented and 1.7 million dollars in value in 2011. By using predictive and geographic analytics, Lancaster was able to gain over a million dollars in productivity on a year-over-year basis.

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90 Ibid.,
91 Ibid.,
92 Nucleus Research Report m153 - IBM SPSS, “ROI Case Study: City of Lancaster”, 3.
93 Ibid., 3.
94 Ibid.,
95 Ibid.,
## FINANCIAL ANALYSIS

**IBM SPSS - City of Lancaster**

### Annual Benefits

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<td><strong>Other</strong></td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
<td>$ -</td>
</tr>
<tr>
<td><strong>Total per period</strong></td>
<td>$ 25,474</td>
<td>$ 7,023</td>
<td>$ 7,023</td>
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### Financial Analysis

<table>
<thead>
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<th>Results</th>
<th>Year 1</th>
<th>Year 2</th>
<th>Year 3</th>
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</thead>
<tbody>
<tr>
<td><strong>Net cash flow before taxes</strong></td>
<td>$(695,940)</td>
<td>$ 845,625</td>
<td>$ 1,774,285</td>
<td>$ 1,482,697</td>
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<td><strong>Net cash flow after taxes</strong></td>
<td>$(58,131)</td>
<td>$ 469,065</td>
<td>$ 979,828</td>
<td>$ 819,454</td>
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<tr>
<td><strong>Annuel ROI - direct and indirect benefits</strong></td>
<td><strong>1301%</strong></td>
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<tr>
<td><strong>Annual ROI - direct benefits</strong></td>
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<tr>
<td><strong>Net Present Value</strong></td>
<td>$ 1,904,985</td>
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<td><strong>Payback period</strong></td>
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<td><strong>Average Annual Cost of Ownership</strong></td>
<td>$ 30,221</td>
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<tr>
<td><strong>3 year IRR</strong></td>
<td>891%</td>
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</tbody>
</table>

### Financial Assumptions

- **All Government Taxes**: 45%
- **Cost of Capital**: 7.00%

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*Table 2: Nucleus Research Rate of Return Calculation - Source: Nucleus Research*
Chapter 4: Baltimore’s Smart City Revelation
The City of Baltimore has begun to use smart city technology towards public safety. In 2011 Baltimore entered and was one of three US cities selected to receive a Smarter Cities Challenge grant from IBM as part of IBM’s philanthropic efforts to build a Smarter Planet. During a three-week period in October 2010, a team of seven IBM leaders worked in the City of Baltimore to deliver recommendations around two key challenges that were identified by Baltimore Mayor Stephanie Rawlings-Blake and her senior leadership team: public safety and youth services. For purposes of this paper, we’ll focus on their public safety recommendations. I interviewed IBM’s Program Manager - Corporate Citizenship and Corporate Affairs, Sally Scott Marietta, the lead in working with Baltimore Mayor Stephanie Rawlings Blake’s administration.

I interviewed Sally Scott Marietta, Program Manager - IBM Corporate Citizenship and Corporate Affairs, to understand IBM’s Smart City work in Baltimore and across the United States. Sally works with local leaders to share information to make better
decisions by government, identify their most enduring problems, mobilize technological and human resources, and deploy strategic and deliberate solutions.” Perhaps, the most interesting part of the interview was Sally’s reflective look back on Baltimore’s Smart City journey from 2011 until 2014. More important than the results we discussed, was the process. When the IBM team first came to Baltimore as part of its Smart City challenge, they rode around the city in a van to get a sense the IBM team a sense of Baltimore’s social status. They also rode around with police and had the opportunity to witness its smart technology. Baltimore City Police use a technology called Pocket Cop that delivers information on suspects in Baltimore to their phones with GPS. One of the biggest lessons learned was how the IBM changed Pocket Cop. Instead of receiving information on everyone in the city, they streamlined the data to only contain information on suspects in their district. The continuous theme Sally mentioned was how important ownership over the data was to a Smart City. Ownership of the data by a central unit ensures it is not only being collected but also being connected to data from other departments. Sally concluded the interview with her top three recommendations from their 2011 visit, they included:

- Apply data analytics to existing police data sets to more effectively identify and apprehend criminals, deploy police officers more efficiently, enhance case resolution, identify risk factors and enhance intervention approaches.

- Enhance the functionality of the Police Department’s Side Partner handheld devices to increase police officer time out of cars by deploying real time handheld alerts,
providing timely, usable information to officers filtered by assignment and geography and tracking suspects using GPS technology.

Baltimore also implemented IBM’s recommendations with the creation of Citistat and Citiwatch. Citistat is a soft technology approach to public safety that evaluates policies and procedures practiced by City departments for delivering all manners of urban services from criminal investigation to pothole repair. Staff analysts examine data and perform investigations in order to identify areas in need of improvement. City agencies are required to participate in a highly particularized presentation format designed to maximize accountability. Agencies must be prepared to answer any question raised by the Mayor or her Cabinet at CitiStat sessions, which are held every four weeks. Since Baltimore city started using it in 1999, it has saved the city over $350 million in overtime pay. The Smart Neighborhood Initiative will build upon Baltimore City’s CitiWatch program that provides state-of-the-art CCTV cameras throughout the City of Baltimore in an effort to assist Police and other City agencies with public safety. The cameras are monitored 24 hours a day and 365 days of the year by certified CCTV monitors with law enforcement backgrounds. The Mayor’s Office of Information Technology ensures the functionality of the cameras provides administration and reporting on camera availability, directs vendors that maintain and service the cameras on the streets and provides CCTV

97 Ibid.,
99 Ibid.,
training to officers. The Community Partnership is a voluntary registry that contains the locations and owner information of privately owned surveillance systems—information that is valuable to the Baltimore Police Department in the event of a crime.  

- **Better Access** – The Community Partnership is a voluntary registry of surveillance systems that will allow police to locate valuable evidence faster.

- **Commitment** – Joining CitiWatch and the Baltimore Police in the fight against crime and displaying your CitiWatch Community Partnership placard shows your commitment to a safer neighborhood and a better Baltimore.

- **Cooperation** – The Community Partnership is designed to increase cooperation and communication, and to improve relationships between business owners, the community, and the police.

In 2014 the city expanded its use of smart city technology with the Citiwatch program. Citiwatch allows private property owners to take part in the program; a press conference was held outside *The Avenue Bakery* on October 14, 2014 to introduce the program’s expansion. James Hamlin, *The Avenue Bakery Owner*, became the first property owner to sign up for the partnership. I spoke with Mr. Hamlin a few months after the press conference to discuss my Smart Neighborhood idea. In 2010, Hamlin opened the Avenue Bakery at Baker Street and Pennsylvania Avenue in West Baltimore. He grew up nearby.

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100 Ibid.,
101 Ibid.,
102 Ibid.,
103 Ibid.,
104 Ibid.,
106 Ibid.,
and remembered when he saw the Temptations and Stevie Wonder walking on Pennsylvania Avenue, which was Baltimore's bustling nightlife district.\textsuperscript{107} Years later, the area declined into one of the city's more notorious open-air drug markets, where dealers sold heroin out of stores and held businesses hostage. He said he believes the main business strip can return to its heyday if shoppers and business owners feel safe. The CitiWatch partnership, he said, is a good step toward that end. "It is important that people and tourists and that the community itself feels safe," Hamlin said.\textsuperscript{108}

"I think we can instantly quadruple the eyes we have on the street,"\textsuperscript{109} Mayor Stephanie Rawlings-Blake said. Baltimore's growing network of public surveillance cameras was first viewed as a deterrent, with blinking blue lights that became ubiquitous in some crime-ridden neighborhoods.\textsuperscript{110} The city has been taking the cameras out of service over the last few years and adding ones that stand out less.\textsuperscript{111} Officials stress that becoming part of the CitiWatch system is voluntary and — unlike the current feeds from Hopkins and the MTA — police officers will look at

\textsuperscript{107} Ibid.,
\textsuperscript{108} Ibid.,
\textsuperscript{109} Ibid.,
\textsuperscript{110} Ibid.,
\textsuperscript{111} Ibid.,
footage from the expanded private system only after they receive a report of a crime in the vicinity. The police will not be able to view a live feed from the newly signed-up private cameras, officials said. Baltimore Police Commissioner Anthony W. Batts said the new program strengthens two areas in which police are trying to improve: technology and community relations.

In 2005, Thomas J. Nestel, the Philadelphia Police Staff Inspector, surveyed police departments in the fifth largest U.S. cities, requesting from each its policy and practice guidelines for video surveillance cameras. Nestel writes the following about the NYPD’s use of closed-circuit television (“CCTV”) technology for carrying out surveillance: The department has been utilizing CCTV surveillance systems for five years and the operation includes more than one hundred cameras. The cameras were installed at locations based on crime data and input from the Housing Authority. The system is actively monitored and operates on a 24/7 basis. A written policy for operations does exist but was unavailable for review. The community was not involved in the initial or subsequent implementation process. CCTV operators do not receive special training. Constant supervision does not exist for CCTV operations.

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112 Ibid.,
113 Ibid.,
114 Ibid.,
116 Ibid.,
117 Ibid.,
118 Ibid.,
119 Ibid.,
120 Ibid.,
121 Ibid.,
Mr. Nestel’s critique is applicable to Baltimore when studying was to enhance Baltimore Citistat and Citiwatch smart city programs. Currently, Baltimore’s policy and practice guidelines for video surveillance cameras are not being informed by the community. This step would provide transparency and provide that enhances Baltimore’s Citiwatch program. Former Baltimore City Commissioner Anthony W. Batts statement regarding the department’s need to get better at community engagement and technology serve as validation of my assertion. Baltimore’s Citiwatch system is not monitored 24 hours in real time or during predetermined hours within Baltimore’s most troubled communities. This is another critique that became evident in conversations with residents and business owners in the Walbrook neighborhood. Open air drug dealing was one of the top items that could potentially be solved with technology. Residents stated police say they are unable to make an arrest without seeing an actual transaction taking place, which leaves them either playing detective while trying managing their own lives. Residents stated they make 911 or 311 calls repeatedly but the same known bad actors are allowed to maintain an open air drug market. Business owners I talked to along the 3100 North Avenue business corridor echoed similar sentiments. Police stated their main weapon are resident calls with descriptions of suspicious characters and that residents don’t call enough. These comments highlight how a Smart Neighborhood approach can bridge the gap so bad actors are quickly identified, abandoned houses are protected, lighting is improved along side streets and alleys, residents feel safe and revitalize their communities. The urban policy recommendations in the next chapter explore this connection further.
Chapter 5: Urban Planning Policy Recommendations
On November 19, 2015 from 6:00 pm until 8:00 pm, I coordinated a meeting with the North Hilton and Merchants Association Task Force, a community based organization that is working to improve the life outcomes for low-income children and families living along the corridor and surrounding communities, discussed the smart city public safety initiative during their regularly scheduled community meeting. The group is a coalition of business owners, pastors, residents, who have their own community-based organizations. There were also former public officials, and business owners from the adjacent North Avenue Business corridor owners at the meeting. Mr. Pittman, a 95-year-old community organizer for the last nine years, organizes the meetings. He started organizing the neighborhood as way to adopt a lot that he wanted to see transformed into housing and as a way to create jobs for the neighborhood.

In 2008, with the pro bono support of Jordan & Associates and the Kirwan institute for race and ethnicity, they drafted The Neighborhood University Initiative (NUI), a community based strategy to build partnerships between Coppin State University, Baltimore City, and non-profit organizations towards physically revitalizing the North Avenue Corridor, which encompasses the 2700 – 3100 blocks of North Avenue. The NUI’s primary goal is to create a mixed income community that connects residents to affordable housing, high performing schools, quality childcare and early education, and responsive health care. The key catalyst for the NUI is the North Avenue and Hilton Merchants Association Task Force.

Twenty-five years later, part of their vision recently came true, when the Task Force partnered with the Woda Group and developed North Avenue Gateway Apartments, a 64
unit affordable housing development. The project was built with low-income housing tax credits from Maryland Department of Housing and Community Development. Their story was chronicled in the Baltimore Sun Paper on December 12, 2013.

"It just didn't happen," said Herman Pittman, the organization's 90-year-old founder, who has headed the task force off and on for about 25 years.\textsuperscript{122} He said plans typically fell apart when developers failed to secure the financing.\textsuperscript{123}

The roughly $15 million project, which started construction in July, opened this fall with the help of $10.5 million from the state in federally authorized low-income housing tax credits and roughly $1.9 million in state loans through the Department of Housing and Community Development's rental housing funds program, said Kevin Bell, Senior Vice President at Woda.\textsuperscript{124} The city also forgave $1.5 million in items such as back taxes and liens on the properties, he said.\textsuperscript{125} There are certainly sections of the city where we would not support this type of development because we don't think there is a market yet,"\textsuperscript{126} said Peter Engel, Baltimore Housing's deputy commissioner for project finance and development.\textsuperscript{127} "The fact that it leases up quickly shows that the area does have demand, still does have a market."\textsuperscript{128} A Rosemont-Walbrook resident who drafted a community development plan in 2008 and now works for Woda, said he believes the

\begin{flushright}
\textsuperscript{122}\textsuperscript{123}\textsuperscript{124}\textsuperscript{125}\textsuperscript{126}\textsuperscript{127}\textsuperscript{128}
\end{flushright}
neighborhood is changing, although more work is needed.\textsuperscript{129} "I think as folks become more alert to this community development area you're seeing resident pride and a greater sense of community," he said.\textsuperscript{130} "The same way it got here is the same way it's going to leave — incrementally. But you've got to take the first step and this is one giant first step."\textsuperscript{131}

During the meeting the group took a survey aimed at gauging their support for element of a smart neighborhood public safety initiative. There were 8 Baltimore City residents present at the meeting and 4 non-Baltimore city residents. The communities they represented included Walbrook (4), Northwest Community Action, Reservoir Hill, and West Baltimore, Carrol County, and Woodlawn. Below are there responses.

1. When asked do you feel safe in your neighborhood throughout the day, Baltimore city residents responded yes 3 times and sometimes 5 times to the question. The respondents who did not live in Baltimore City responded yes 2 times and sometimes 1 time to the question.

2. When asked are you willing to increase public safety through cameras that are linked to police monitors on streets in front of your home, Baltimore City residents responded yes 6 times and unsure 2 times.

3. When asked what places require 24 hour police monitoring Baltimore City residents mentioned Main streets such as North Avenue, Gwynn Falls, alleys, side streets and

\textsuperscript{129} Ibid.,
\textsuperscript{130} Ibid.,
\textsuperscript{131} Ibid.,
commercial corridors such as the North Avenue Hilton Business district were each mentioned 4 times.

4. When asked where they willing to connect private cameras to with Baltimore City Police, Baltimore City residents answered yes 7 times and maybe 1 time. Non-Baltimore City residents answered yes 1 time and unsure 1 time. One respondent stated she wanted the camera in front of her home but she did not wanted it near but not directly in front of her home.

5. When asked what areas of public safety do they think would be improved most through technology, Baltimore City residents responded violence 5 times, open air drug selling 7 times, and abandoned houses 3 times. Non-Baltimore City residents responded violence 2 times and open air drug selling 3 times.

6. When asked if they were a property owner, would they be willing to fund public safety initiatives through taxes if it increased (City) revenue, Baltimore City residents responded yes 7 times and unsure 1 time. This was surprising given Baltimore’s relatively high property tax. Non-Baltimore City residents responded yes 1 time.

7. When asked do they think better use of technology can improve public safety, Baltimore City residents responded yes 8 times. Non-Baltimore City residents responded yes 4 times.

Baltimore’s Smart Neighborhood of tomorrow will rely on grassroots efforts merging with public/private resources, law enforcement, and the creation of policies that promote the smart neighborhood approach.132 These policies must take into account the changing

landscape of the smart cities movement happening in cities like Philadelphia.\textsuperscript{133} 

**FastFWD** is a partnership among The City of Philadelphia, Good Company Group, a social enterprise accelerator, and the Wharton Social Impact Initiative. FastFWD was created through the City of Philadelphia’s participation in the Bloomberg Philanthropies’ Mayors Challenge, a competition to inspire American cities to generate innovative ideas that solve major challenges and improve city life.\textsuperscript{134} The first cycle of the FastFWD project brought to light the enormous opportunity for innovation around public safety while the second cycle of FastFWD expanded the view of public safety to include broader, more proactive stability of communities.\textsuperscript{135} Focus areas included, but were not limited to, substance abuse, housing stability, and youth/gang violence.\textsuperscript{136} The first part of FastFWD is to **identify and define** through the alignment phase that generates interest in the FastFWD initiative by identifying the most pressing general challenge sectors within the City as well as synthesizing insights from City officials, industry leaders and academic experts around those sectors.\textsuperscript{137} This stage also includes Zero Stage, an intensive workshop on problem identification and systems thinking to generate transformative ideas, reframe challenges, and develop shared goals.

\textsuperscript{133} Ibid.,  
\textsuperscript{134} Ibid.,  
\textsuperscript{135} Ibid.,  
\textsuperscript{136} Ibid.,  
\textsuperscript{137} Ibid.,
to accelerate positive change in urban environments, using Philadelphia as a focal point. FastFWD conducts a second round of interviews within the identified challenge sectors to compare their respective market opportunities. After the interview and research steps are complete, FastFwd hosts a convening of top innovators and stakeholders from industry, government and academia to generate partnership and alignment on the challenges identified through the deep dive. The culmination of the Identify and Define phase is the generation of an open call for solutions to the specific challenges identified in the deep dive where the challenges are packaged as market-based opportunities that allow innovators to leverage their domain expertise, propose their prototypes and iterate with the city buyer at hand. The strongest teams and most scalable, impactful proposals are selected for participation in a social impact accelerator program. Applications are selected based innovation, implementation, impact, city engagement and entrepreneurship. Successful solutions are pitched to other cities in annual symposia and national demonstration events. Fast Forward provides an example for how a Smart Neighborhood Initiative can be “rolled out” and implemented in a way that tackles public safety through public private partnerships with grassroots innovation as the centerpiece.

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138 Ibid.,  
139 Ibid.,  
140 Ibid.,  
141 Ibid.,  
142 Ibid.,  
143 Ibid.,
The policies below offer a framework for how Baltimore City can develop a Smart Neighborhood. Baltimore’s Smart Neighborhood of tomorrow will rely on grassroots efforts merging with public/private resources, law enforcement, and policies that underline the smart neighborhood approach. These policies must take into account the changing landscape of the smart cities movement happening across the country such as New York and Philadelphia.

**Smart Neighborhood Policies**

1. **Public Safety Not Crime and Justice**: Frame smart neighborhood approach as an effort to increase the quality of life by reducing multiple negative indicators. This was illustrated by the connection between incivilities and crime in Baltimore. The overall mission of the initiative can’t only be a crime and justice initiative. If people view this as merely another “war on crime”, it’s more likely they will not be open to the other benefits such as increased investment, higher residential occupancy, and cleaner community. This would also contribute to the forming the scope and purpose for law enforcement so they understand this isn’t just an effort to increase their capacity to fight crime, but improve the quality of life for residents across multiple indicators.

2. **Grassroots Driven**: Community consultation prior to implementing a smart neighborhood program. Research has revealed that Baltimore city residents believe technology can make a difference but want to be involved in the process. Public notice should be given 30 days before CCTVs are deployed in residential and commercial areas; residents should also be given 30 days to respond. Another way to
involve the community is through police updates at local community meetings. This ensures an informal process accompanies regulated community consultation.

3. **Promote Investment**: Promote public and private investment by monitoring CCTVs 24 hours in real time in hot areas along inner blocks and neighboring commercial corridors. Retailers along urban corridors can serve as amenities and increase residential value; however, many of the retail corridors have been infiltrated by open air drug markets and loitering. These nefarious elements deter would be consumers from entering the retailer and serve to decrease the economic activity.

4. **Leverage Existing Resources**: Leverage public/private investments by developing smart neighborhoods in tandem with affordable housing developments. Many of these developments in what are classified as transitioning neighborhoods. The development of smart neighborhoods in this context ensures that current investments are sustainable and new developments are encouraged.

5. **Leverage Existing Capacity**: Integrate and leverage Baltimore’s Citistat and Citiwatch programs and knowledge into the Smart Neighborhood. Both of these approaches are already using a smart city approach and any smart neighborhood will require an infrastructure developed with the city to house monitors and other hard technology. Integrating this technology has the dual effect of reducing start-up cost and developing a uniform operating procedure. The knowledge would also transfer the lessons learned to current and future smart neighborhoods.

6. **Legislative Mandate**: Introduce legislation that owners of abandoned houses be equipped with CCTVs and sensors at owner’s expense. This is consistent with the
precedent set in 2006 by the City Council when for the first time they considered mandating that private entities install video surveillance cameras.\textsuperscript{144} This is also ensures that property owners at a minimum invest in keeping their property and the neighborhood safe and clean.

7. **Share Information across Baltimore City Departments**: Allow for data from CCTVs, sensors, and other hard technology to be used across multiple agencies such as code enforcement, department of public works and Baltimore City police departments. Baltimore City is already performing this task through its Citistat program.

8. **Public/Private Partnerships**: Finance through public private ventures and savings to pay for investments overtime. Hard technology equipment companies such as General Electric and Streetline allow clients to pay for the cost of installing equipment overtime. In November 2015 President Barack Obama’s Administration issued a press release regarding their “Smart Cities” Initiative that will invest over $160 million in federal research and leverage more than 25 new technology collaborations to help local communities tackle key challenges such as reducing traffic congestion, fighting crime, fostering economic growth, managing the effects of a changing climate, and improving the delivery of city services.

9. **Training and supervision of Personnel**. Personnel charged with operating video surveillance cameras or controlling access to such cameras or to video footage must be properly trained and closely supervised. Personnel involved in CCTV use should

\textsuperscript{144} Loren Siegel, Robert A. Perry, and Margaret Hunt, “WHO’S WATCHING? VIDEO CAMERA SURVEILLANCE IN NEW YORK CITY, AND THE NEED FOR PUBLIC OVERSIGHT” pg. 2.
be appropriately trained and closely supervised in the responsible use of this technology. Each law enforcement agency implementing or using a CCTV program should designate a responsible individual(s) for the implementation and oversight of the program.

10. Prohibitions and Penalties: The city must explicitly prohibit unlawful video surveillance camera practices, and prescribe penalties for violators. The unauthorized use of video surveillance technology by city agencies or private corporations can result in serious harm to individuals engaged in conduct that is entirely lawful. The effects of such harm extend broadly, undermining fundamental rights of privacy, speech and association. The city must clearly define unlawful use of video surveillance technology and provide for legal sanctions against persons who are responsible for such unlawful conduct.

These policies are exemplified in other Smart City Initiatives and more I believe Baltimore has a similar opportunity like Philadelphia to use technology to address public safety in the Walbrook Neighborhood of Baltimore, MD.
Chapter 6: The Smart Neighborhood Initiative Pilot
The Walbrook Smart Neighborhood Pilot

The key argument this paper seeks to highlight is that smart city technology implemented with a system like the diagram picture above can revitalize Baltimore’s neighborhoods. Baltimore’s progress with smart city technology has laid the foundation for this work to take place and my key recommendations involve piloting a smart neighborhood approach in Baltimore’s Walbrook neighborhood, which is a part of the Greater Rosemont and Mondawmin Area. The key elements of the smart city initiative is the installation of hard technology along the inner blocks of Walbrook and the North Avenue business corridor, both would be linked to 24 hour police monitoring. The Walbrook Neighborhood is bordered by W North Avenue to the South, Hilton Ave to the West, Dukeland Ave to the...
East, and Gwynn’s Fall Parkway to the North. The smart neighborhood initiative would increase the number of street lights and ensure they are all smart poles that have cameras that are monitored in real time to police monitors in squad cars and to a central location like Brazil’s new Operations Center in Rio provides the incident commander and responders with a single, unified view of all the information that they require for situational awareness. The neighborhood is a prime place to pilot a smart neighborhood approach because it has recently experienced millions of dollars in public/private investment. The neighborhood is adjacent to The Woda Group, Inc. North Avenue Gateway I and II apartments. These affordable housing developments have added 65 high quality units and additional 65 units slated to come online in 2017. These developments represent a public/private investment worth $30 million dollars. North Avenue Gateway II is currently seeking financing; North Avenue Gateway I is fully occupied with a 90% occupancy rate. There are many area assets which could be built upon, such as having Coppin State University and Baltimore City Community College as anchor institutions and potential partners; Mondawmin Mall is also a commercial and retail attraction for city residents.

Despite these investments, the neighborhood still lags behind many of the city’s public safety indicators as measured by crime per 1,000 residents, percentage of abandoned or vacant houses, and number of occupied houses; these indicators come from the Baltimore City Neighborhood Indicators Alliance. It’s hopeful these strategies will improve these indicators by reducing the amount of illegal activities such as open air drug activity and illegal dumping; 2) increase the number of occupied houses and 3) enhance the recent
public and private investments taking place on North Avenue, Coppin State University, and Mondawmin Mall. The Smart Neighborhood Initiative would integrate Baltimore City’s Citistat and Citiwatch programs with hard technology along the North Avenue Hilton business corridor as well. Perhaps, the most often asked a question regarding smart cities during interviews with public officials, police officers, is what will actually be done or implemented beyond collecting data that’s already available? The Smart Neighborhood Initiative would be different in two ways that are being implemented in other neighborhoods.

**Urban Planning Recommendations: Smart Neighborhood Pilot**

**Recommendation 1:** Install hard technology such as smart LED Lamps along streets and alleys and install hard technology such as sensors and cameras in and around abandoned houses. Where to place this type of technology should be done in concert with the community serving as consultants to inform the police regarding the placement of CCTVs. The cost for these laps should be paid for over time with the projected cost savings. These devices will also be monitored in real time for 24 hours or during predetermined hours. Research revealed only two street lights on relatively long blocks such as Longwood and Rosedale Streets with a high number of abandoned houses. Observation and conversations with residents revealed Longwood, Rosedale, Popular Grove, Walbrook, Streets as the inner city blocks that flows north to south and connects W North Avenue and Gwynn’s Falls Parkway. Imagine this scenario: A gunshot echoes down a city street at night; a passersby turns to look, but can’t make out the scene in the darkness. The first to react effectively is the nearest street lamp.
Figure 34: GE Intelligent Lamp – These types of street lights can be equipped with hard technology such as sensors, cameras, and other hard technology aimed at increasing public safety. This style of light may work well along the inner blocks of the Walbrook Neighborhood. Source: www.GE.com

It hears the gun and automatically goes to full brightness to illuminate the scene, film the attacker and call the emergency services – all in an instant or how about medical emergencies? Ibid., An intelligent lighting system could be a central part of the healthcare infrastructure, serving as a network through which hospital managers receive updates in real time about a patient’s location and status.\textsuperscript{145} It could significantly improve the quality of medical care and speed up response time.\textsuperscript{146} Networked intelligent LED lighting systems equipped with sensors that can see, feel and hear could soon illuminate roads and hallways, and help improve security, optimize traffic, monitor the environment, and a whole lot more.\textsuperscript{147}
Figure 35: Walbrook Avenue at Longwood Street facing west – Malik Jordan

The above picture is at the intersection of Longwood and Walbrook Street facing west. Interviews with undercover narcotic detectives revealed the challenges with controlling open air drug activity and other nuances. According to the officers, abandoned houses allows offenders to act as if they are living at an unoccupied residences and unless the police officers have been given their current attire, it is difficult to know and pursue suspects without having to rely on a large degree of suspicion. Conversations with Baltimore City police officials also revealed hesitancy regarding pursuing would be offenders because of the tense relations between Baltimore City police officials. Smart
poles with cameras will allow police officers to monitor Walbrook’s inner blocks in real time so they can identify with suspects based on reliable data.

The above picture is the intersection of N. Longwood and Walbrook Street. The smart poles would increase the number of street lights to provide for better lighting at night and provide public safety and health officials to monitor the “hot spot” resident have consistent. Residents from the neighborhood stated this as a “hot spot” for local open-air drug activity and other public health nuances that deter from experiencing a high quality of life. The eyes of the smart poles are needed to replace the eyes of residents who are at work during the daytime. Residents in the neighborhood often work during the day, which allows for illegal activities such as open-air drug activity. According to police,
they also rely on residents calling in complaints to 311. The dilemma with this approach is that residents are often at home during hours when illegal activities are taking place. The other challenge is the high number of abandoned houses that severely reduce the number of “eyes of the street” and subsequently the number of potential reporters of illegal activities. By providing real time monitoring of inner city blocks via smart poles, the roles of residents and police officers would work more seamlessly.

Figure 37: Alleyway in between Longwood Street and Clifton Avenue – Malik Jordan

Residents stated alleys in between blocks as places where they would like to see cameras because they provide cover for illegal activities such as dumping and open air drug activity. These alleys are vulnerable because of the lack light and eyes. Residents in the neighborhood have reported these alleys as “hot spots”. Installing smart poles in alleys in
these places would provide the necessary eyes and suspect identification to reach the smart neighborhood goals.

![Image of Herbert Street at Rosedale Avenue](image_url)

**Figure 38: Herbert Street at Rosedale Avenue - Malik Jordan**

**Recommendation 2:** Building off Baltimore’s Citiwatch program, cameras and sensors will be placed on entry points of abandoned houses. Similar to New York, my recommendation is to mandate the placing of cameras on non-owner occupied properties at the owner’s expense. According to Walbrook residents, blocks of abandoned row houses such as Herbert Street pictured above are a breeding ground for illegal activity as well. Residents stating observing drug addicts using Herbert Street to take drugs they
purchase in the neighborhood. These devices will also be monitored in real time for 24 hours or during predetermined hours.

![Image of North Avenue Business Corridor](image)

**Figure 39: North Avenue Business Corridor north side – Credit Malik Jordan**

**Recommendation 3**: Install smart lights along the North Avenue and Hilton commercial corridor. Residents stated the commercial strip as the main business artery of the neighborhood. Discussions and observations with business owners revealed a desire to connect their cameras to police monitors in real time. Currently, illegal activity takes place because of the low foot traffic and offenders are allowed to perform transactions and escape long before the police arrive. Although transactions may be captured on tape, the smart lights like the ones pictured below are equipped with cameras, sensors, audio and Wi-Fi. The lights, pictured below, are shorter in length than the street poles and are
catered to be more aesthetic. They also have the capacity to detect parking spots and serve other functions that relate to increasing public safety.

![Figure 40: GE Intelligent Lamp – Lights such as these are changing the urban landscape and can be placed along commercial corridors. They have Wi-Fi, sensors, cameras, and other technology designed to increase public safety. This style of lamp may work well along the North Avenue business corridor.](image)

**Recommendation #4**: The Smart Neighborhood Initiative will enhance the city’s efforts to increase public safety by opening a dialogue with the Baltimore City Police Department on ways the technology can improve the quality of life in Walbrook. This would take the form of meetings with the Southwest Police station over the course of several months. The initiative would also have to be inclusive of other city agencies, similar to Baltimore Citistat program. Since the Baltimore City Police Department is already implementing CCTVs and 24 hour monitoring throughout the city, I believe this represents an entry for point for dialogue. It’s also worth noting this has the potential to
improve police and community relations and implement technology; both of which have been stated as goals for the Baltimore City Police Department.

The Smart Neighborhood Initiative will be a community-driven public/private partnership to increase the public safety in the Walbrook Neighborhood through smart city technology that focuses on public safety. The scope of work will bring together community residents, community businesses, law enforcement, churches, and elected officials towards creating a viable “smart city” approach for the Walbrook Neighborhood. The Smart Neighborhood Project will be inclusive of the goals the community has already set forth in Baltimore City’s GRAMA. The GRAMA plan was an intense planning effort between the community and Baltimore City planning department. The plan addressed many of the community goals, which included activate North Avenue and nearby neighborhoods by strategically locating CSU facilities and services off-campus. The community also wanted to aggressively pursue crime reduction measures while preserving or enhancing stable areas; they also wanted the city to proactively help stabilize areas in fair condition, redevelop or rehabilitate areas with a high rate of

Figure 41: Cop looking at a mounted lap top. This style of computer would monitor CCTVs in real time from commander center and squad cars in the Smart Neighborhood Pilot Project. Credit Jim Courtney
vacancy and strengthen enforcement of the sanitation code. The community’s understanding of Walbrook’s landscape will be vital to understanding where to place hard technology. One of the Smart Neighborhood’s key elements that slightly deviate from what Baltimore City is currently doing is the installation of smart poles along the inner neighborhoods streets and alleys such those N. Longwood Street from N Avenue to Gwynn Falls. As you can see from the pictures, there are only two street lights located along Longwood Avenue. Residents in the community have stated this street is very dark at night without much visibility. The following picture is at the intersection of Walbrook and Longwood.

**Smart Neighborhood Indicators**

The 2012 Greater Rosemount and Mondawmin Area Master Plan (GRAMA), encompasses the Walbrook neighborhood, and its principles serve as the revitalization principles for the Smart Neighborhood Initiative. The following indicators were chosen based on interviews with residents where the stated crimes associated with these indicators as the Smart Neighborhood Initiative will seek to turn the following indicators:

**Indicator 1: Crime rate per 1,000 residents**: captures incidents of homicide, rape, aggravated assault, robbery, burglary, larceny, and auto theft that are reported to Baltimore City Police Department. In 2013 the rate for Greater Mondawmin, the neighborhood encompassing Walbrook, was 93. This is higher than the Baltimore City average of 63. These incidences are per 1,000 residents. The Smart Neighborhood Initiative would seek to reduce this rate to the city average.
Indicator 2: Decrease the percentage residential properties vacant and abandoned: The percentage of residential properties that have been classified as being vacant and abandoned by the Baltimore City Department of Housing out of all properties. Properties are classified as being vacant and abandoned if: the property is not habitable and appears boarded up or open to the elements; the property was designated as being vacant prior to the current year and still remains vacant; and the property is a multi-family structure where all units are considered to be vacant.

Indicator 3: Increase the percentage of housing units that are owner-occupied: The percentage of homeowners that are the principal residents of a particular residential property out of all residential properties. It is important to note that a portion of these owner-occupied properties may be subdivided and have tenants that pay rent and are not included in the calculation.

The Smart City Initiative will be measured on its ability to bring the above indicators to Baltimore City levels within 2-3 years. The following indicators come from Baltimore City Neighborhood Indicators Alliance.

<table>
<thead>
<tr>
<th>Crime rate per 1,000 residents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baltimore City</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td>2013</td>
</tr>
<tr>
<td>63</td>
</tr>
</tbody>
</table>

Table 3: Smart Neighborhood Indicators Source: Baltimore Neighborhood Indicators Alliance
### Percentage of residential properties vacant and abandoned

<table>
<thead>
<tr>
<th></th>
<th>Baltimore City</th>
<th>Greater Mondawmin</th>
<th>SNI Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>8%</td>
<td>11.4%</td>
<td>8%</td>
</tr>
</tbody>
</table>

**Table 4:** Smart Neighborhood Indicators  
**Source:** Baltimore Neighborhood Indicators Alliance

### Increase the percentage of housing units that are owner-occupied

<table>
<thead>
<tr>
<th></th>
<th>Baltimore City</th>
<th>Greater Mondawmin</th>
<th>SNI Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>2013</td>
<td>57%</td>
<td>51%</td>
<td>57%</td>
</tr>
</tbody>
</table>

**Table 5:** Smart Neighborhood Indicators  
**Source:** Baltimore Neighborhood Indicators Alliance

In November 2015 President Barack Obama’s Administration issued a press release regarding their “Smart Cities” Initiative that will invest over $160 million in federal research and leverage more than 25 new technology collaborations to help local communities tackle key challenges such as reducing traffic congestion, fighting crime, fostering economic growth, managing the effects of a changing climate, and improving the delivery of city services. The new initiative is part of this Administration’s overall commitment to target federal resources to meet local needs and support community-led solutions. Over the past six years, the Administration has pursued a place-based approach to working with communities as they tackle a wide range of challenges, from investing in infrastructure and filling open technology jobs to bolstering community policing.
Advances in science and technology have the potential to accelerate these efforts. An emerging community of civic leaders, data scientists, technologists, and companies are joining forces to build “Smart Cities” – communities that are building an infrastructure to continuously improve the collection, aggregation, and use of data to improve the life of their residents – by harnessing the growing data revolution, low-cost sensors, and research collaborations, and doing so securely to protect safety and privacy. As part of the initiative, the Administration is announcing:

- More than $35 million in new grants and over $10 million in proposed investments to build a research infrastructure for Smart Cities by the National Science Foundation and National Institute of Standards and Technology.
- Nearly $70 million in new spending and over $45 million in proposed investments to unlock new solutions in safety, energy, climate preparedness, transportation, health and more, by the Department of Homeland Security, Department of Transportation, Department of Energy, Department of Commerce, and the Environmental Protection Agency.
- More than 20 cities participating in major new multi-city collaborations that will help city leaders effectively collaborate with universities and industry.

The Smart Neighborhood Initiative would need to undergo a process similar to certain elements of FastFWD in Philadelphia before it can actually be implemented. The Walbrook neighborhood is an opportunity to leverage ongoing public and private investments currently taking place along W. North Avenue. In response to the April riots,
Mayor Stephanie Rawlings Blake introduced the creation of One Baltimore. The mission of the initiative is to create equitable outcomes for children and families living in Baltimore. My argument is that a smart city approach geared towards public safety can revitalize Baltimore inner neighborhoods and underlining that premise is the notion of equity. As the world becomes more digital and technology-dependent, the opportunity gap between technology haves and have-nots carries increased urgency. Narrowing this digital divide and ensuring all Baltimoreans can participate fully is central to the City’s strategy for technology and innovation. Digital technologies enhance well-being, reduce costs and resource consumption, and enable government to engage more effectively and actively with its citizens.
Chapter 7: Conclusion - What Would Success Look Like
The rebuilding of Baltimore’s neighborhoods is a story of a city reconciling itself from a segregated past that formed its social and economic dynamics. As evident by the 1968 and 2015 Baltimore riots, history created neighborhoods that are still in need of revitalization. Despite millions dollar efforts to revitalize neighborhood like Sandtown, they have continued to deteriorate when measuring quality of life indicators such as crime, abandoned houses, and sanitation. Public safety is similar to the foundation of residential and commercial structures. If the foundation is not secure, the above ground elements do not matter. I share this as a way to drive home my point regarding public safety as the missing element.

When making my argument for a smart neighborhood public safety approach to revitalize Baltimore’s neighborhoods, I understand the other elements such as jobs, education, and housing can also be argued as key elements for revitalization. However, they require multiple factors such parent involvement, corporations relocating to Baltimore in mass to increase employments, or market conditions to change in a way where Baltimore’s population rises, or for employers to relocate to Baltimore in order to change Baltimore’s dynamic. These elements are harder and take extremely more time to realize gains, as was pointed out in the case of Lancaster, CA where the city saved approximately $2 million dollars. These initiatives also don’t share the ability for municipalities to utilize them for multiple purposes as was pointed out in the case of Brazil where monitors originally used for crown monitoring can now be used to detect floods.

In a city with 16,000 vacant houses contributing to crime and reduction in the quality of life, revitalization effort to secure abandoned houses with sensors or line streets,
alleyways, and main corridors with proper lighting is perhaps needed more than anything else. When it comes to what you can improve with smart city technology and gives community and municipalities the best “bang for their buck’, the evidence is clear that a public safety approach that uses smart city technology is the key element.

There is another unintended benefit of my argument: improved relations between Baltimore City Police and its citizens, which is also a publicly stated goal of the new Baltimore City Police Department. My discussions with police revealed a officers unwilling to pursue drug dealers for fear of being seen as being too aggressive. The public would argue it’s their job to protect and serve regardless since taxpayers are financing their salary. A Smart Neighborhood implemented using the policies I’ve recommended provides all stakeholders with the tools to achieve common goals in a constructive and non-confrontational manner. If Baltimore’s transitioning neighborhoods can become Smart Neighborhoods, it could use the realized savings and improved perceptions to advance its education, housing, and employment agendas.

A smart neighborhood approach can be used to revitalize Baltimore’s urban neighborhoods. This was illustrated in New York’s closed camera television system, which has reduced the crime throughout the city. The example of New York also shows how community involvement can enhance the process. Unfortunately, the example of Sandtown-Winchester elevates the hard lesson Baltimore learned by not investing in its public safety.
This argument is also proven through Baltimore’s Citistat and Citiwatch programs. While these programs have reduced city budget cost, they have not had a good enough effect to turn the curve on Baltimore’s public safety reality and perception. Baltimore’s usage of information technology on multiple levels gives the city a solid foundation to implement future technologies that will turn the curve and increase public private partnerships. As highlighted in Chapter 6, there is a natural connection and entry point for a conversation to occur with Baltimore residents and police on how to use a smart neighborhood approach to increase public safety. One of the key takeaways from the riots was the need for better community relationships and the better use of technology towards increasing public safety. Philadelphia’s Fast Forward program shows the synergy created by developing a grassroots approach to increasing public safety with information technology.

The importance of this approach lies in its ability to revitalize Baltimore’s urban neighborhoods. The approach leans on turning neighborhoods that are unsafe, either in reality or perception, into places where investors are incentivized to invest in these neighborhoods. Sandtown-Winchester should serve as a cautionary tale of what happens when investments take place before ensuring a foundation of public safety.

Why is this important? After experiencing riots in 2015, public safety was a hot topic in Baltimore’s 2016 Mayoral race. When you review the community investments that have taken place to revitalize Baltimore’s neighborhoods such as Sandtown-Winchester, it’s clear the results have been good but not sufficient enough to become catalyst for greater neighborhood rebuilding efforts. This can only be accomplished with a public safety
approach that uses smart city technology. Technology is important in this context because it can reduce the number of interactions that led to the Baltimore riots.

A smart neighborhood approach, especially one that’s grassroots driven, makes it possible for police and citizens to create safer neighborhoods together in ways that weren’t originally available. These types of investments have the potential to stabilize neighborhoods so they are prime for public and private investments. This approach creates an equitable Baltimore City that is able to meet its deepest challenges with innovation and engagement.
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