Piecing Together the Boston Harborwalk

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Abstract

Our project sought to assist The Boston Harbor Association in the completion of the Boston Harborwalk. This process included creating an inventory of the completion and state of maintenance of the Boston Harborwalk and evaluating the impact of having a mandated public walkway on private land. By comparing our data to the data from U.S. Census Bureau, we concluded that there might be indications of environmental injustice in the policy of implementing the Boston Harborwalk. Using these conclusions, we provided The Boston Harbor Association recommendations to help expedite the completion of the Boston Harborwalk.

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Authorship

This project report represents the joint work of Danielle Masone, Molly Mioduszewski, Devin Mulcahy and Kelin Song.

Executive Summary

Since the clean-up of the Boston Harbor in the 1970s, the city of Boston has continued their efforts to maintain and promote the Boston waterfront. The Boston Harbor Association was founded in 1973 in order to ensure public waterfront accessibility. They created the Boston Harborwalk to increase public interaction and foot traffic along the Boston waterfront. The Boston Harborwalk is intended to be forty-seven miles and currently is approximately eighty percent complete.

The primary legal component that allowed the implementation of the Boston Harborwalk is Chapter 91. Passed in 1866, its full name is Massachusetts General Law Chapter 91 and is also known as the Waterways Licensing Program. A clause in the zoning law requires waterfront property owners to develop a Boston Harborwalk on their land when there is development. The policy of environmental justice also must be considered when dealing with public access to the Boston waterfront.

Environmental justice ensures that residents of waterfront neighborhoods cannot be subjected to the unfair use or access of the Boston waterfront. Environmental justice works concurrently with Chapter 91. For the policy of Chapter 91 to be environmentally just, it would have to equitably distribute environmental benefits and allow access to natural resources such as Boston Harbor through the Boston Harborwalk. Chapter 91 and environmental justice are two policies we researched through the course of this project.

One of the goals of our project was to provide The Boston Harbor Association information that will help expedite the completion of the Boston Harborwalk. The first objective for this goal was to create an inventory of each property parcel along the entire route of the Boston Harborwalk which includes data on parcel information, land use, surrounding amenities, and the current state of maintenance of each parcel. The method for collecting these data was to traverse the Boston Harborwalk and organize them in the form of a Microsoft Excel spreadsheet which is formatted to be compatible with a Geographic Information Systems map. Our second objective for this goal was to use the inventory and information from the U.S. Census Bureau to investigate if there is a correlation between demographics and the completion and state of maintenance of the Boston Harborwalk. The last objective for this goal was to determine if there is a correlation between land use and the completion and state of maintenance of the Boston

Harborwalk. For our second and third objectives, we researched and analyzed the demographics and land use of each waterfront neighborhood.

The second goal of this project was to evaluate the impact of a mandated public walkway on private property. The objectives for this goal were to determine the benefits and drawbacks of the Boston Harborwalk, as well as the opinions regarding the policy of implementing the Boston Harborwalk. The methods for these objectives were to administer a structured questionnaire to property managers and interview The Boston Harbor Association's board members.

In the concluding stages of our project, our team first determined that the Boston Harborwalk is forty-three miles long with approximately a sixty percent completion, contrary to the assumptions by The Boston Harbor Association. Our team recommends that The Boston Harbor Association create new publicly available maps for each waterfront neighborhood using our data to improve the accuracy of the complete and incomplete sections.

From the demographics we researched, we concluded that median income is the most prominent factor in the completion and state of maintenance of the Boston Harborwalk. In terms of land use, we also concluded that it does not necessarily determine the completion and state of maintenance of the Boston Harborwalk. We suggest that The Boston Harbor Association further research the demographic and land use trends with developmental trends of the Boston Harborwalk to investigate if residents of waterfront neighborhoods are being given fair access to open space and funding concerning the Boston Harborwalk.

We also concluded that Chapter 91 is successful in certain aspects of its implementation. We found that Chapter 91 saves tax payer's money because it is a less expensive alternative than buying the waterfront land or seizing the waterfront through eminent domain. However, there is indication that the implementation of Chapter 91 could be environmentally unjust. If this is proven to be true, this would represent a violation of Massachusetts' policy of environmental justice. We recommend that The Boston Harbor Association research Chapter 91's policy of implementation to see if it is environmentally just and possibly allocate more public funding towards the completion of the Boston Harborwalk in low income waterfront neighborhoods.

In summary, these data we collected provides insight to the Boston Harborwalk's current completion and state of maintenance. These data can be used as a starting point for evidence that may indicate the presence of environmental injustice, thus creating pressure to expedite the completion of the Boston Harborwalk.

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Chapter 1 Introduction

Throughout the 20th century, there has been a precedent of conflicts among commercial, private, and public interests concerning waterfront development in the United States. Boston Harbor is no exception to these conflicts. Boston Harbor is significant to the residents of Boston not only for economic reasons, but also for its cultural and environmental ties. Up to the early to mid-1900s, a lack of state legislation led to an unclean Boston Harbor and environmental pollution. In 1919 the Metropolitan District Commission was created to regulate the quality of harbor water; however, there was little improvement to the sewage-filled water. Even when the federal Clean Water Act was passed in 1972, Boston did little to increase water quality (Tarr, 2009). This is because it would have been economically detrimental to delay shipping in order to execute a clean-up operation due to the high volume of traffic in Boston Harbor. It was not until the mid-1970s that the Boston community united to advocate for a cleaner Boston Harbor. Their efforts proved significant and influential when the city of Quincy successfully sued the Boston Water and Sewer Commission; thus putting pressure on the state government to allocate serious funds and efforts to clean Boston Harbor. Since then, the city of Boston has made a continuing effort to maintain and revitalize Boston Harbor (Gordon 1997).

The Boston Harbor Association (TBHA) was founded in 1973 by the League of Women Voters and the Boston Shipping Association to primarily clean up one of the most polluted harbors in the United States—Boston Harbor. Currently, the association has been involved in developments along the harbor including industrial and maritime transportation, public access around the harbor, waterfront business development, as well as progress towards environmental activism and protection. The Boston Harbor Association continues its effort towards helping to establish and maintain an environmentally friendly waterfront. Though the purpose of all these projects was to ensure the longevity of Boston Harbor, the main project was the Boston Harborwalk, which was to increase public interaction and foot traffic along the waterfront. Therefore, the Boston Harborwalk was born in response to the cleanup of Boston Harbor so that the public may experience an accessible gentrified waterfront.

The Boston Harborwalk is intended to be a forty-seven mile walkway and is now approximately eighty percent complete. Chapter 91, introduced in the year 1866, ensures the promotion and protection of public access to the coastal waterfront in Massachusetts. The concept behind the policy of the Boston Harborwalk's implementation is to ensure fair access

and involvement of all persons in regard to having a mandated public walkway built and maintained on privately owned land. In Chapter 91, a zoning clause legally binds waterfront property owners to develop a Boston Harborwalk path if they are planning to develop on their property. The walk currently has gaps along its length caused by a lack of property development from public and private waterfront property owners.

Our first goal was to provide The Boston Harbor Association with information that will expedite the completion of the Boston Harborwalk. The first objective to this goal was to create an inventory of each property parcel along the entire route of the Boston Harborwalk which includes data on parcel information, land use, surrounding amenities, and the current state of maintenance of each parcel. We collected these data while traversing the Boston Harborwalk and organized them in the form of a Microsoft Excel spreadsheet. This inventory is compatible with a Geographic Information Systems map and will be accessible not only to The Boston Harbor Association, but to the public through the Boston Harborwalk's website. Our second objective for this goal was to use the inventory and information from the U.S. Census Bureau to investigate if there is a correlation between demographics and the completion and state of maintenance of the Boston Harborwalk. The last objective for this goal was to determine if there is a correlation between land use and the completion and state of maintenance of the Boston Harborwalk.

The second goal of this project was to evaluate the impact of a mandated public walkway on private property. The objectives for this goal were to determine the benefits and drawbacks of the Boston Harborwalk, as well as the opinions regarding the policy of implementing the Boston Harborwalk. The methods for these objectives were to administer a structured questionnaire to property managers and interview The Boston Harbor Association's board members. At the conclusion of this project, we made recommendations to The Boston Harbor Association so that they may complete and promote public access along the Boston Harborwalk.

Chapter 2 Literature Review

Our team will first introduce the relevant history of Boston Harbor and waterfront development. Next, our team will introduce the Boston Harborwalk and discuss its associated legal complications. Finally, we will describe a case study that specifically concerns waterfront development in Boston.

Historical Context

Boston has a long and rich contemporary history of ethnic growth. The Boston busing crisis of the 1970s captures the ethnic makeup of Boston at the time as well as the direction it was moving in. In 1974, Massachusetts courts concluded that there had been a history of institutional segregation in the Boston public school system (Morgan v. Hennigan, 1974). To remedy the inequality, Judge Arthur Garrity Jr. ordered that each Boston public school reflect the ethnic profile of the state. This meant that white students from the neighborhoods of South Boston, Charlestown, East Boston, and the North End would be forced to attend inner city schools in Roxbury and Dorchester in order to achieve ethnic balance. Likewise, black students were forced to attend formerly majority white schools. This process became known as busing. After busing's implementation, charged and violent protests erupted throughout Boston. South and East Boston residents thought that their rights were being alienated because they could not send their children where they pleased. Busing ended in the 1980s due to severe community backlash from ethnic neighborhoods.

Picture 1 Boston Busing Riots (Stanley Forman, 1976)

In 1974, minorities represented a mere one percent of East Boston's population. By 1990 that percentage swelled to twenty-three percent, and by 2010 it exploded to sixty-three percent (Vigue, 1998) (U.S. Census Bureau, 2010). However, the opposite could be said for South Boston as well as Charlestown. A heavily Irish-American ancestral neighborhood, the white population of South Boston and Charlestown has stayed as the majority for the past fifty years (Vigue, 1998) (U.S. Census Bureau, 2010). This is also the case for the North End, a part of

Downtown. Like South Boston and Charlestown, the North End has historically been a white ethnic enclave, in this case for Italians. However, escalating property values and an influx in young professionals in the 1980s had begun to uproot the Italian population. These young professionals were majority white, thus the white population remained the majority (Axelrod, 1987). The trends in these neighborhoods continue to this day (U.S. Census Bureau, 2010).

Minority populations have historically been based in the neighborhoods of Dorchester and Roxbury. These neighborhoods have been the central location of Boston's black population since the 1950s following the large black migration from the Southern United States (Boston Public Health Commission, 2010). Recently, the new wave of Hispanic migration has fortified the minority population in these neighborhoods (U.S. Census Bureau, 2010). The impacts of historical ethnic trends of the waterfront neighborhoods are important to understand the history of the city of Boston.

Boston Harbor History

In the early nineteenth century, Boston residents would brag that Boston Harbor was large enough to contain the entire nation's shipping at once (Rawson, 2009). In the 1830s, deterioration of the Harbor, caused by decades of massive ship traffic, threatened its commercial viability. In addition, environmentalists realized that many of the Harbor's islands were eroding. This waterfront erosion, also known as tidal scour, was solved by a process known as "landmaking". Landmaking is defined as filling in flat coastal areas, with dirt, ashes, gravel and sometimes even trash. This solution increased the overall size of Boston by about sixteen percent. Joel Tarr (2009) states that landmaking in the nineteenth century was primarily driven by a need for harbor improvements such as the creation of long wharfs, a demand for upper-middle class residential areas, and a plea to correct pollution problems. Landmaking was very valuable to the city because it allowed commercial waterfront businesses to gain a foothold and flourish.

At the time, landmaking was beneficial to the city, but it caused major problems for Boston Harbor in the next half century due to the growth of technology, civil development, and population. The city of Boston started to build structures such as bridges, highways and embankments that caused ecological problems such as low fish reproduction, inhibited vegetation growth, and pollution. Specifically, pollution was mainly caused by sewage outlets releasing waste into Boston Harbor, thus contaminating the water. Poor water quality was not

only detrimental to aquatic ecosystems, but also to public health because of the damage to local aquifers (Haar, 2005). Boston Harbor remained polluted for many years due to government and civil neglect and lack of public activism. Serious public awareness did not become a reality until the late 1960s to the early 1970s.

Advocates of Boston Harbor

The Metropolitan District Commission (MDC), which was in charge of sewer management, did minimal work to clean Boston Harbor. Before any major effort was made to clean up Boston Harbor and stop pollution, raw sewage and runoff continued to flow freely into the Harbor due to overtaxed waste treatment systems. Negligible progress was made towards sanitation, even with the establishment of the Environmental Protection Agency (EPA) and the passage of the Federal Water Pollution Control Acts in the early 1970s. The pollution levels in the water were not addressed and continued to violate the pollution act until the late 1980s when the Boston Harbor Project (BHP) was started. The Boston Harbor Project aimed to significantly improve the sanitary condition of the Boston Harbor (Rawson, 2009) and succeeded by motivating the Metropolitan District Commission to research advanced sewage plans and to completely renovate their system to benefit Boston Harbor. The Boston Harbor was then on the path to revitalization (Haar, 2005). This project led to the formation of many different organizations, both public and private. One of them was The Boston Harbor Association.

The Boston Harbor Association was founded in 1973 by the League of Women Voters and the Boston Shipping Association. Its mission statement is to develop a balanced solution between public accessibility, the need for private profit, and environmental protection for diverse interests ranging from harbor users to waterfront businesses. The Boston Harbor Association focuses on achieving this goal by promoting three main programs: Boston's Working Port, the Boston Harbor Marine Debris Removal and Prevention Program, and the Boston Harborwalk Network (The Boston Harbor Association, 2012).

History of Waterfront Development

Contemporary urban waterfront redevelopment exemplifies the historic modification of land and water uses along the coastline of thousands of cities in the United States. A number of factors contributed to current waterfront development. For example, after the Second World War, technology advanced exponentially; this led to the loss of thousands of acres of waterfront property due to an accelerated industrialization process. In turn, this foreshadowed the movement

to preserve historic sites and buildings. Along with an increase in historic preservation, the general public also showed an increased interest in environmental activism and water sanitation. These factors can be seen in many waterfront developments in North America, such as the Toronto Harbourfront and the Charlestown Navy Yard (Gordon, 1997).

The Toronto Harbourfront

The Toronto Harbourfront was founded in 1972 and sits on 92 acres of the western side of Toronto's urban waterfront district. Originally a gift to the city from the Canadian federal government, the purpose of the project was to develop a diversely used urban waterfront. The Harbourfront Corporation was the agency charged to oversee the project's development and received initial widespread public acclaim for their work on their redevelopment efforts and public programming (Gordon, 1997). However, the Canadian federal government required that the Harbourfront Corporation be self-financing. This led the Harbourfront Corporation to heavily court private interests in order to sustain itself, receiving a total of approximately $131,000 in capital investment (Gordon, 1997). Following an increase in waterfront high-rises, the public became upset and protested vigorously in favor of a moratorium on development. The Canadian federal government eventually dissolved the Harbourfront Corporation in 1990, leaving the project half finished (Gordon, 1997).

This dissolution of the Harbourfront Corporation presents an opportunity to analyze how the Toronto Harbourfront and the public interact. One of the main ways to analyze waterfront development projects and public interaction is by examining how the nature of a community will change under a development (Sairinen, 2005). The Toronto Harbourfront project was managed by a corporation that could not receive government money, and thus was cornered into relying heavily on private interests. In this case, the public users of the Harbourfront suffered because they did not share the privilege of being the primary stakeholders. In fact, Gordon (1997) concluded that it was important for agencies in charge of waterfront development, as well as the governments who create them, to allow for public, private, and environmental interests to be weighed equally, thus ensuring that one is not marginalized for the sake of another.

The Charlestown Navy Yard

Another case study that provides a parallel to the Boston Harborwalk is the Charlestown Navy Yard development project. The Charlestown Navy Yard is located on the other side of the Charles River basin from Downtown Boston (City of Boston, 2012). The Navy Yard itself was a

major maritime transportation hub from 1800 until 1974. After major shipping evaporated, the Navy Yard and the surrounding area were left with a district of industrial buildings that were functionally outmoded but historically significant. In 1978, the Boston Redevelopment Authority (BRA) acquired 105 acres of land within and around the Navy Yard with the intention of developing it into a multi-use area. The developers were successful in implementing a series of new streets, public parks, and walkways, such as the Boston Freedom Trail, which ends in the Navy Yard. The Authority was also able to encourage private development of luxury residences and commercial space through an aggressive marketing campaign to bill the development as being "ultra luxury". However, the project was plagued by cost overruns and reported a deficit every year for twenty years (Gordon 1997). Overall, the Boston Redevelopment Authority was able to create a viable waterfront development project that balanced public and private use. This process is ongoing with the Boston Redevelopment Authority and private developers continuing to invest in the Charlestown Navy Yard (Palmer, 2004).

In terms of the social aspects of the Charlestown Navy Yard, the case presents an interesting analysis. As stated before, understanding the way a community will change due to redevelopment is a method of examining public interactions (Sairinen, 2005). At the time the neighborhood around the Charlestown Navy Yard opposed the creation of the park, however presently the public has perceived the Charlestown Navy Yard and its public attractions positively. For this reason, this case is very relevant to the Boston Harborwalk because the initial reaction to the creation of the Boston Harborwalk was negative, but after its creation, it has been heavily trafficked as well as received favorably by stakeholders.

The Boston Harborwalk

These case studies and The Boston Harbor Association's work on the Boston Harborwalk Network are instances of progress in waterfront development history. The Boston Harborwalk Network was created to revitalize Boston's waterfront in 1984. At the time, the media was calling Boston Harbor the most unsanitary harbor in the United States (Save the Harbor/Save the Bay, 2007). In response, the Massachusetts legislature and The Boston Harbor Association authorized the creation of a forty seven mile long continuous public walkway with the goal of reestablishing the shoreline and cleaning up the harbor. To develop public interest, walkways, parks, sitting areas, cafes, public art and other amenities were established along the Boston Harborwalk. The Boston Harbor Association has since worked closely with the City of Boston's

Environmental Department, Boston Redevelopment Authority, the Massachusetts Department of Environmental Protection and waterfront property owners to complete and promote the Boston Harborwalk (The Boston Harbor Association, 2012).

Chapter 91

The primary legal component that our project will address is known as Chapter 91. The purpose of Chapter 91 is to ensure the public's free and unhindered access to the navigable waterways of Massachusetts. Passed in 1866, its full name is Massachusetts General Law Chapter 91 and is also known as the Waterways Licensing Program. A clause in the zoning law requires the development of a Boston Harborwalk when there is any redevelopment along Boston navigable waterways.

The legal definition of a navigable waterway has been a point of much contention (Arnold, 1933). Traditionally, the courts have decided this on a case by case basis. However, the navigability of waterways is important in determining to which specific waterways Chapter 91 applies. For an example, the navigable waterways along the Boston Harbor are Fort Point Channel and Neponset River, and without Chapter 91, the Boston Harborwalk would not be required along their waterfronts.

In the scope of this project, Chapter 91 allows the Boston Harborwalk to exist through extensive licensing and approval procedures. The Boston Harbor Association has been able to apply Chapter 91 on developing areas, as demonstrated by the near completion of the Boston Harborwalk. Most likely, the sections of the Boston Harborwalk that are incomplete are situations where developments are not planned. Chapter 91 is only part of the history concerning the complexity of waterfront development.

Environmental Justice

Environmental justice is the concept ensuring "the fair treatment and meaningful involvement of all people regardless of ethnicity, color, sex, national origin, or income with respect to the development, implementation and enforcement of environmental laws, regulations, and policies." (EPA, 2012) Even though the term was coined in the 1980's, the concept itself is not new. There are specific passages in the Massachusetts Constitution where the citizens are guaranteed the benefits of the natural qualities of their environment as well as their protection in its utilization. The main theory of environmental justice is that the vulnerable members of society, such as minorities and those living on low income, should not have to bear an unjust

burden or risk concerning the environment. Using this idea, Massachusetts Secretary of Environmental Affairs Bob Durand implemented a policy focusing on environmental justice in 2002 that is still active today (Massachusetts Office of Energy and Environmental Affairs, 2012).

Concerning the Boston Harborwalk and Chapter 91, this policy ensures that citizens of waterfront neighborhoods cannot be subjected to unfair access or use of the Boston waterfront. For the policy of Chapter 91 to be environmentally just, it would have to equitably distribute environmental benefits and allow access to natural resources such as Boston Harbor through the Boston Harborwalk.

Case Study: Boston Waterfront Development Corporation vs. Commonwealth

To illustrate the complexity of designing and implementing waterfront development, our team evaluated the case of Boston Waterfront Development Corporation vs. Commonwealth. In 1978, the Massachusetts Supreme Court heard a case concerning property ownership of coastal land. The land in question was a small section in Boston Harbor that was situated below the low water mark, which has historically been used to determine coastal property boundaries. This case is significant because it richly describes contemporary as well as historical perspectives pertaining to the rights and privileges of private interests, the Commonwealth, and the public to use the shores of the Commonwealth (Boston Waterfront Development Corporation vs. Commonwealth, 1978).

Complexity of implementing waterfront development dates back to the 1600s when the need for commerce greatly encouraged the design of wharves. At its core, a wharf is a fixed docking structure that sits below the high water mark. This created a legal quagmire due to the fact that all the land below the high water mark belonged to the Commonwealth. To solve this problem, the colonial legislature allowed coastal land owners to extend their property claim from the high water mark to the low water mark. Also included in this new law was a provision that any construction below the high water mark could not hinder free navigation of said waters by boats. This is due to the fact that all navigable waterways are owned by the public; and no individual or corporation can designate them for their own use. In Massachusetts, the application of these laws became known as the Lewis Wharf Statutes; so named because of a lawsuit brought by the Lewis Wharf Company claiming title to the land below the low water mark in 1840. This is what is known as a legal precedent (Boston Waterfront Development Corporation vs. Commonwealth, 1978). With this precedent in mind, the Boston Waterfront Development

Corporation was granted the rights to the land below the low water mark in 1978. The issue considered was if the land would be used for the good of the Commonwealth as well as the public or solely for private interests. The Massachusetts Supreme Court upheld the Lewis Wharf Statutes, thereby limiting private development on land below the low water mark. This precedent is still actively applied to the Boston Harborwalk's series of wharves. These wharves are developed and planned so that they do not violate the precedent set by the Lewis Wharf Statutes, Chapter 91, and the environmental justice policy of Massachusetts.

In a broader perspective, this case illustrates how complex dealing with zoning and land laws can be. This case study shows how thorough a waterfront development corporation has to be when making plans for development. For example, the petition to be heard by the Massachusetts Supreme Court was filed in 1964, but was not decided until 1979. This lawsuit alone is about 650 pages long; not including documentation and briefs, indicating how slowly and methodically the legislative and judicial systems work when it comes to property and land. These intricacies are reflected in the method of implementation for the Boston Harborwalk.

Summary

In summary, our review of the literature has revealed a great deal about the rich history of not only Boston Harbor, but also waterfront development overall. Reviewing different waterfront development projects such as the Toronto Harbourfront and the Charlestown Navy Yard has provided our team with relevant historical insight. By looking at what has been done elsewhere, and by studying Boston Waterfront Development Corporation vs. Commonwealth, we have formulated recommendations for The Boston Harbor Association on the relationship between the private managers of the Boston Harborwalk and the public. These recommendations are discussed in chapters 4 and 5 of this report.

Chapter 3 Methodology

There were two goals our team aimed to accomplish with this project. Our first goal was to provide The Boston Harbor Association information that will expedite the completion of the Boston Harborwalk. Our second goal was to evaluate the impact of having a mandated public walkway on private land.

To accomplish our first goal, our first objective was to develop an organized database and inventory of the Boston Harborwalk of the location of each parcel with its property parcel identification number, land use, surrounding amenities, and current state of maintenance of the Boston Harborwalk for the entire route. This inventory was organized in an Excel spreadsheet that is compatible with a Geographic Information Systems map. Our second objective for this goal was to use the inventory and information from the U.S. Census Bureau to investigate if there is a correlation between demographics and the completion and state of maintenance of the Boston Harborwalk. The last objective for this goal was to determine if there is a correlation between the use of land and the completion and state of maintenance of the Boston Harborwalk.

To accomplish our second goal our team had two objectives. The first objective for this goal was to determine the benefits and drawbacks of the Boston Harborwalk from waterfront property managers. The second objective was to determine the opinions of The Boston Harbor Association's board members concerning the implementation of the Boston Harborwalk.

Site Assessment and Data Collection

Our first objective for our first goal was to collect data for our inventory. The first step in our process was to collect individual parcel information from the Boston Redevelopment Authority on each waterfront neighborhood (Charlestown, Dorchester, Downtown, East Boston, Fort Point Channel, and South Boston). The next step was to observe and record the existence of amenities and the state of maintenance of each parcel by traveling the entire length of the Boston Harborwalk. Specifically, for each parcel our group collected data on:

- Location of each parcel and its property parcel identification number found at the Boston Redevelopment Authority website
- Land use (commercial, industrial, public, residential) also found at the Boston Redevelopment Authority website

- Surrounding amenities including lighting, seating, public restrooms, public art, drinking fountains, fishing piers, food service, playgrounds, and trash barrels
- Current state of maintenance of the Boston Harborwalk for the entire route evaluated by the type of walkway, evidence of maintenance, degree of litter, degree of graffiti, perceived danger to pedestrians, and degree of cracked pavement

These amenities and current state factors were specifically chosen because we thought that they were the most beneficial to the public and The Boston Harbor Association as well as being strong indications of a developed and maintained Boston Harborwalk. Observed data regarding public restrooms, public art, drinking fountains, fishing piers, food service, playgrounds, evidence of maintenance, and the perceived danger to pedestrians were ranked on a binary scale for each parcel. If the amenity or current state factor existed on the parcel, we recorded a yes, and if it was not there, we recorded a no. The remainder of these data which includes the degree of lighting, degree of seating, degree of trash barrels, degree of litter, degree of graffiti, and degree of cracked pavement were judged on a scale of one to three. Three represents the optimal degree for amenities and current state factors.

The scale for the degree of lighting for each parcel was the following:

1- No lighting
2- 1 light every 50 yards
3- 2 or more every 50 yards

The scale for the degree of seating for each parcel was the following:

1- No seating
2- 1 seat every 100 yards
3- 2 or more every 100 yards

The scale for the degree of trash barrels for each parcel was the following:

1- No trash barrels
2- 1 trash barrel every 100 yards
3- 2 or more trash barrels every 100 yards

The scale for the degree of litter for each parcel was the following:

1- Rubbish is very apparent and scattered, decreasing aesthetic appeal
2- Some rubbish is apparent and noticeable, decreasing aesthetic appeal from small areas of the parcel

3- No apparent rubbish, no decrease in aesthetic appeal

The scale for the degree of graffiti for each parcel was the following:

1- Graffiti is very apparent and scattered, decreasing aesthetic appeal
2- Some graffiti is apparent and noticeable, decreasing aesthetic appeal from small areas of the parcel
3- No apparent graffiti, no decrease in aesthetic appeal

The scale for the degree of cracked pavement for each parcel was the following:

1- Entire walkway needs to be redone, difficult to walk on, could be dangerous to users
2- Cracks along walkway are small, noticeable but not dangerous
3- Little to no cracks along walkway, barely noticeable

We also created an overall rank for each parcel that took into consideration the degree of amenities and current state factors as well as the size of each parcel. The scale was from zero to five and outlined in the following:

0- Walkway does not exist
1- Dirt or gravel path, no amenities
2- Dirt or gravel path, some amenities
3- Paved path, some amenities
4- Paved path, sufficient amenities, aesthetically pleasing
5- Paved path, plethora of amenities, local attractions, aesthetically pleasing

All these data was gathered and organized on an Excel spreadsheet for interface with a Geographic Information Systems map. An example of this map is shown in Appendix C.

Our second objective for the first goal of this project was to use the inventory and information from the U.S. Census Bureau to investigate if there is a correlation between demographics and the completion and state of maintenance of the Boston Harborwalk. The method by which we accomplished this was thorough researching data on demographics in each waterfront neighborhood. We choose to collect data on population density, median income, and ethnicity from the 2010 US Census and City-Data because we thought that these demographics would have the most causation on the completion and state of maintenance of the Boston Harborwalk.

The third objective for the first goal was to determine if there is a correlation between the use of land and the completion and state of maintenance of the Boston Harborwalk. The method

by which we accomplished this was through researching data on the land use of each parcel. The Boston Redevelopment Authority provides this information and separates land use into four categories: commercial, industrial, public, and residential. Public land use connotates land owned by public agency. We researched land use because we thought that it would have an effect on the completion and state of maintenance of the Boston Harborwalk.

Surveying

The first objective for the second goal was to determine the benefits and drawbacks of the Boston Harborwalk from waterfront property managers. To do this, we surveyed waterfront property managers to determine their opinions of how public users interact with their property. We organized waterfront property managers into four categories: restaurants, hotels, institutions, and agencies. These categories were chosen because they were the most abundant along the Boston Harborwalk, creating a viable pool of resources. Also, we assumed that it was in the best interest of all these categories to be publicized, therefore the foot traffic from the Boston Harborwalk could be seen as an asset to their property. In Table 1, our categories along the Boston Harborwalk are outlined by their population and sample size. This sample size was calculated for a ninety-five percent confidence level using StatTools, an Excel program.

Table 1 Survey Population Size and Sample Size

Category	Population Size	Sample Size
Restaurants	20	20
Hotels	7	7
Institutions	6	6
Agencies	15	15

Prior to sending out surveys, we called each property or facility manager to formally ask for their participation. If they agreed, the survey was sent out electronically through Surveymonkey. The survey consisted of five questions as seen below:

1- What type of business do you manage?
2- What are some of the benefits of having the Boston Harborwalk pass in front of your property? Please be as specific as possible.
3- Did/does the Boston Harborwalk cost more to construct and/or maintain than if it were not open to the public? Please be as specific as possible.

4- What do you see as the pros and cons of managing the forty-seven mile Boston Harborwalk as a public walkway across multiple, mainly private properties? Would you have preferred a different management/ownership model?
5- Please add any additional comments or concerns you have about the Boston Harborwalk that might help us understand its benefits and drawbacks to property owners across whose land it goes.

The second objective for our second goal was to determine the opinions of The Boston Harbor Association's board members concerning the implementation of the Boston Harborwalk. To achieve this, out of the twenty-eight The Boston Harbor Association's board members, we interviewed four who were referred to us by our sponsor as being beneficial to our project. These members consist of Lorraine Downey, Jamie Fay, Al Raine and Tony Pollak. We thought that they would give various opinions about the Boston Harborwalk from both the private and public perspective. During each of these 15 to 30 minute interviews the following questions were asked:

1- Specifically describe your experience during the conceptual and developmental stages of the Boston Harborwalk?
2- Why do you think that different waterfront neighborhoods are in different developmental stages of the Boston Harborwalk?
3- What did you hope for the Boston Harborwalk in comparison to what it has become today?
4- Why do you believe the Boston Harborwalk was implemented as a zoning clause in Chapter 91 as opposed to other options?

These data collected from these surveys will be used to form our conclusions on the effectiveness of the Boston Harborwalk's implementation policy.

Analyzing Data

In the process of analyzing our data, we used Google Earth to calculate the mileage of each waterfront neighborhood which in turn allowed us to calculate the complete and incomplete sections of the Boston Harborwalk in each waterfront neighborhood. We calculated the completed sections of each waterfront neighborhood because it would serve as a comparison to our demographics and land use data.

While researching the US Census Bureau and City-Data, it became apparent that South Boston's demographics include Fort Point Channel's. From hereafter, South Boston includes

Fort Point Channel, thus altering to five waterfront neighborhoods as seen in Appendix A (Charlestown, Dorchester, Downtown, East Boston, and South Boston).

Chapter 4 Findings and Discussion

At the start of this project our team established research questions to guide our study. These questions are: What is the current state of the Boston Harborwalk? Is there a correlation between the completion and state of maintenance the Boston Harborwalk with waterfront neighborhood demographics and land use? Is the policy of implementation of the Boston Harborwalk effective? To answer these questions, we analyzed our inventory as well as waterfront neighborhood demographics and land use to gain information that will help expedite the completion of the Boston Harborwalk. We also evaluated the implementation of the Boston Harborwalk through surveys.

Hypotheses

The first research question is related to demonstrating that the Boston Harborwalk is in actuality forty-seven miles long and is currently eighty percent complete. For our second research question, we hypothesize the demographics of population density, ethnicity, and median income will have an effect on the completion and state of maintenance of the Boston Harborwalk. Areas with high population density, majority white, and higher median income will have a more complete and higher quality Boston Harborwalk. Also, land use will have an effect on the completion and state of maintenance of the Boston Harborwalk. Public and commercial land will be the most complete and in the best condition compared to residential and industrial due to the desire for foot traffic. For our third research question, we hypothesize that Chapter 91 is a successful method in the implementation of the Boston Harborwalk because of lower costs to the city and state and its adherence to environmental justice. These hypotheses will be verified through the data collection and analysis process.

Inventory

Inventory percentages. After developing our inventory, we calculated two categories of percentages that we used for analysis. The first category is the percent of completion in each waterfront neighborhood. The percent of completion was defined as the miles of completed Boston Harborwalk divided by the total miles of Boston Harborwalk. As described in Chapter 3, the overall ranking was calculated on a scale of zero to five for each parcel. The second category for analysis is the percent of the average ranking for each waterfront neighborhood. For the average rankings, we calculated an average of all parcels which includes complete and incomplete parcels and an average of completed parcels.

Percent of completion. Our calculated length of the entire Boston Harborwalk was 42.33 miles. Within that, we calculated 25.67 miles of completed Boston Harborwalk and 16.66 miles of incomplete Boston Harborwalk. Therefore the calculated percent of completion for the entire Boston Harborwalk was 60.64 percent. This information was also calculated by waterfront neighborhood *(Table 2)*.

Table 2 Percent Completion by Waterfront Neighborhood

Neighborhood	Miles Complete (mi)	Miles Incomplete (mi)	Total Miles (mi)	Percent Complete (%)
Charlestown	4.13	1.47	5.60	73.75
Dorchester	6.12	3.77	9.89	61.88
Downtown	3.56	0.10	3.66	97.27
East Boston	3.40	6.24	9.64	35.27
South Boston	8.46	5.08	13.54	62.48
All Harborwalk	25.67	16.66	42.33	60.64

The Boston Harbor Association assumes the Boston Harborwalk to be forty-seven miles long and eighty percent complete. While Boston's waterfront is approximately forty-seven miles long, only approximately forty-three miles can be utilized to implement the Boston Harborwalk. This four mile difference is due to the post-9/11 security restrictions regarding high risk areas such as Logan Airport and Dorchester Gas Tank. The discrepancy between the percent complete of The Boston Harbor Association's and our data could be attributed to incomplete parcels that The Boston Harbor Association considers complete. For an example, a stretch of the Boston Harborwalk in East Boston on Bayswater Street is shown in Appendix D. Our team believes that this street did not count as a Boston Harborwalk, but after consulting with our sponsor, we found that the sidewalk on the inland side is a completed portion of the Boston Harborwalk. While this section was proven to be a completed Boston Harborwalk because we consulted with our sponsor, other areas such as this can lead to confusion regarding the interpretation of a complete or incomplete Boston Harborwalk.

Percent of ranking. Our calculated average of completed parcels for the entire Boston Harborwalk was 3.61 and the average of all parcels was 2.36. This information was also calculated by waterfront neighborhood on a scale from zero to five *(Table 3)*. Zero indicates no

development, whereas five is high quality development with many amenities. An area with many undeveloped parcels (parcels with zeros) will receive a much lower average of all parcels. For example, East Boston has an average of completed parcels of 4.09. This means that of the completed parcels, they are of very good quality (see rankings in Chapter 3). However, East Boston has an average of all parcels of 0.80. This indicates that there are many undeveloped parcels along the East Boston waterfront, creating this large difference between the two averages. From this, we infer that the more developed the Boston Harborwalk in a waterfront neighborhood is, the closer the average of completed and average of all parcels will be.

Table 3 Average Ranking by Waterfront Neighborhood

Neighborhood	Average of Completed Parcels	Average of All Parcels
Charlestown	3.40	2.83
Dorchester	3.18	1.65
Downtown	3.79	3.58
East Boston	4.09	0.80
South Boston	3.61	2.66
All Harborwalk	3.61	2.36

An assumption that we made is that the state of development in each parcel would be consistent and have a continuous section of the Boston Harborwalk. We realized through site assessment that certain large individual parcels had sections with different stages of development so they were ranked as separate parcels.

Demographics

From the 2010 U.S. Census, we used the population density, ethnicity, and income of each waterfront neighborhood for comparison to the percentage of Boston Harborwalk completion and average ranking of each waterfront neighborhood.

Demographic data. The population density of each waterfront neighborhood is shown in Table 4. The ethnicity of Massachusetts and all residents of each waterfront neighborhood are shown in Figures 1-6. The median income of each waterfront neighborhood is shown in Figure 7.

Table 4 Population Density of Each Waterfront Neighborhood

Neighborhood	Density (residents per square mile)
Charlestown	8,113
Dorchester	11,212
Downtown	29,108
East Boston	5,985
South Boston	7,241

We believe Downtown is the densest waterfront neighborhood because of the high rise buildings and the high income housing. While Dorchester's population density is the second highest, this is possibly due to the high number of low income housing. Though we do not have enough data to support this argument, we speculate that waterfront neighborhoods with high and low income housing will be more densely populated.

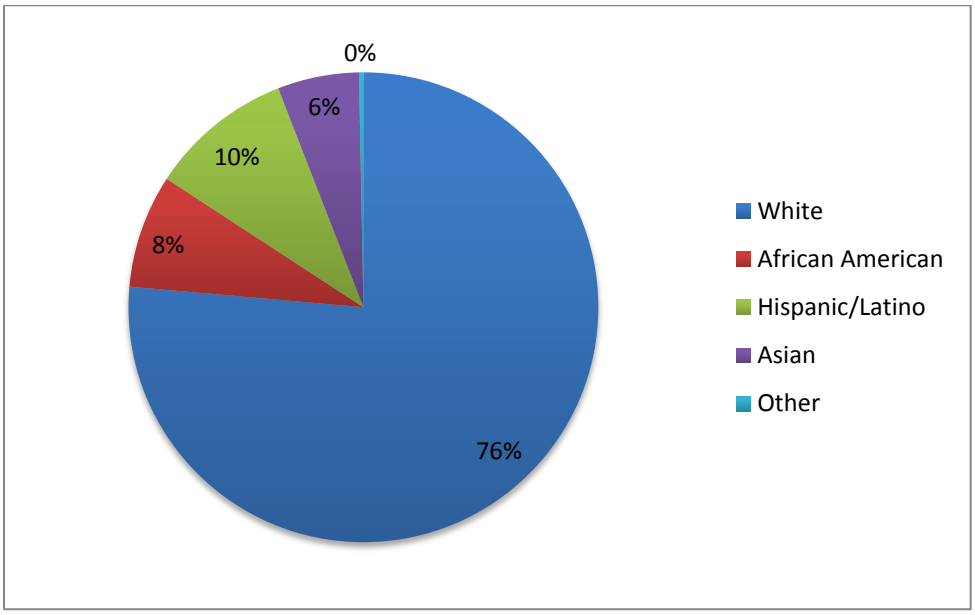

Figure 1 Ethnicity of Massachusetts

The ethnicity of Massachusetts has historically been predominately white. This is the due to geographic isolation from areas with high minority populations. This chart is used as a comparison to the ethnicities of the waterfront neighborhoods of Boston.

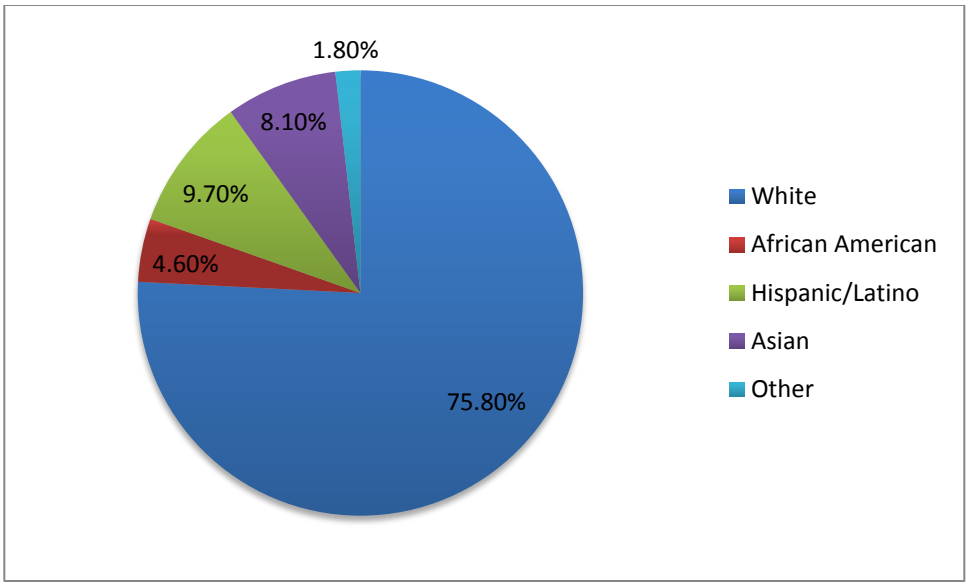

Figure 2 Ethnicity of Charlestown residents

Historically Charlestown has been predominately Irish due to the settlement of Irish immigrants following the Potato Famine of 1845. To this day, it is still predominately white.

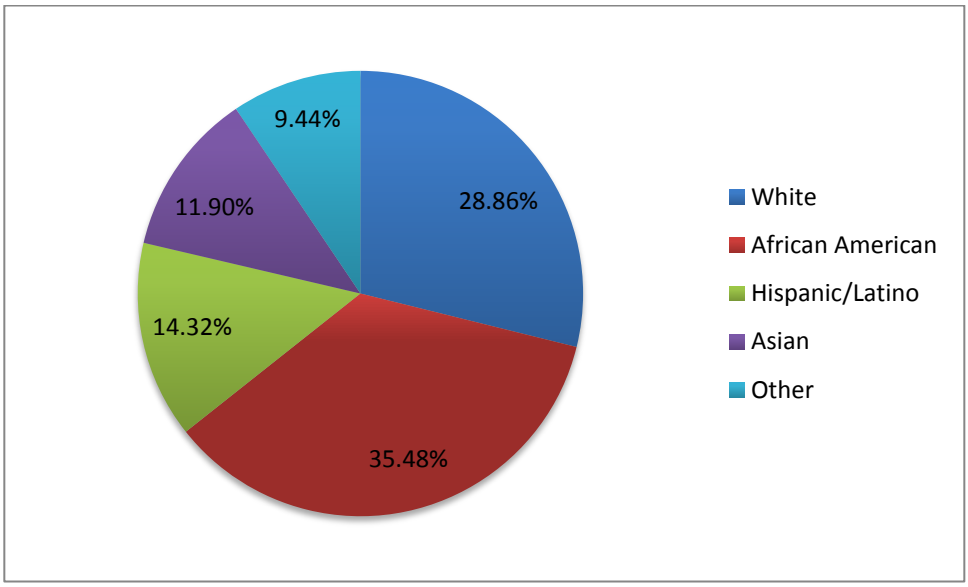

Figure 3 Ethnicity of Dorchester residents

Historically Dorchester has been predominately African American due to the migration of African Americans following the era of Reconstruction. To this day, it is still plurality African American.

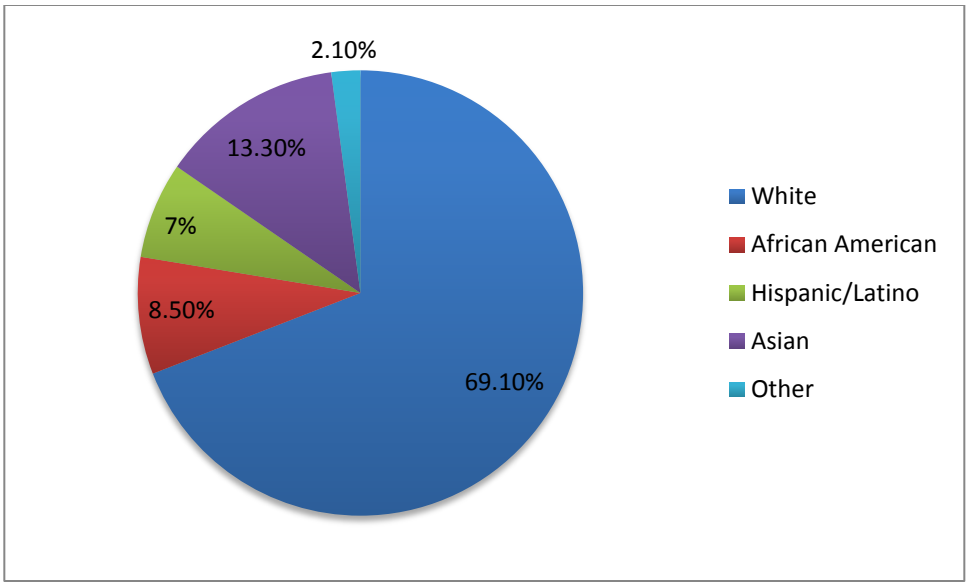

Figure 4 Ethnicity of Downtown residents

Historically the section of Downtown known as the North End has been predominately Italian due to the settlement of Italian immigrants. Also, Downtown has historically been a prestigious neighborhood where high income white families lived. This trend is still evident in the ethnic makeup of Downtown.

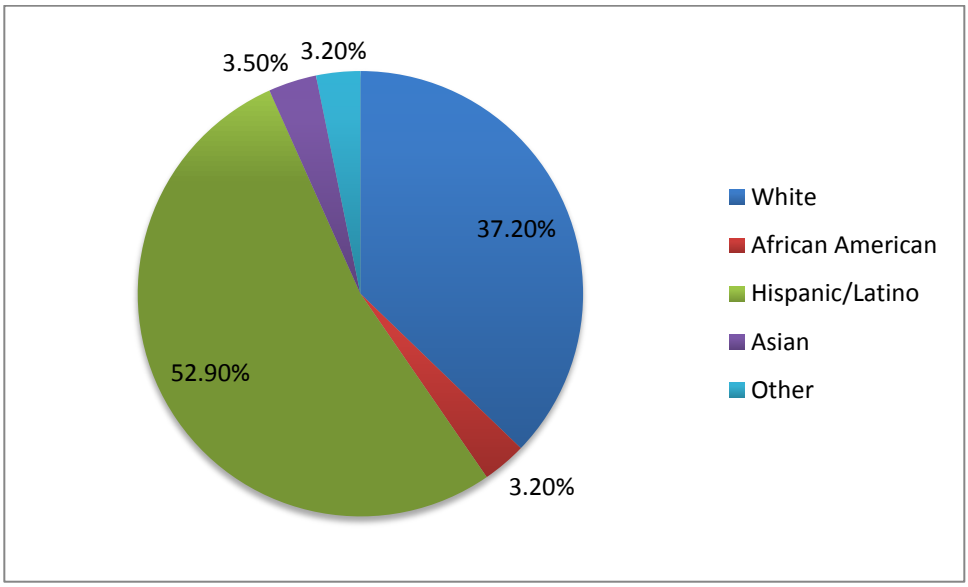

Figure 5 Ethnicity of Boston residents

East Boston has had a history of ethnic demographics. In the 1970s, the minority made up only one percent of the East Boston population. Over the next forty years, Hispanic migration

from Central and South America has increased the percentage of Hispanics to approximately fifty-three percent because of the low rents and affordable housing.

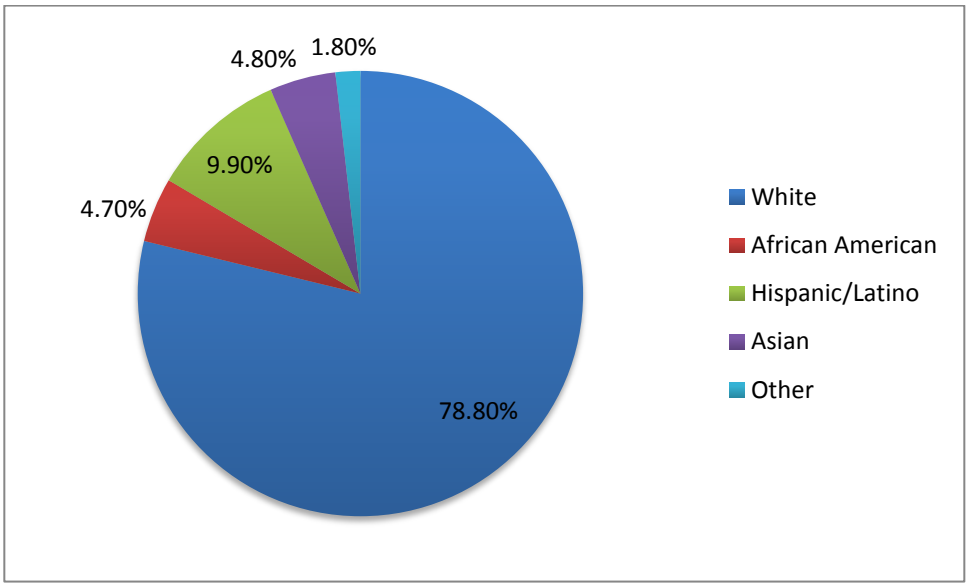

Figure 6 Ethnicity of South Boston residents

South Boston has exhibited similar ethnic trends as Charlestown. Historically, South Boston has been predominately Irish due to the settlement of Irish immigrants following the Potato Famine of 1845. To this day, it is still predominately white.

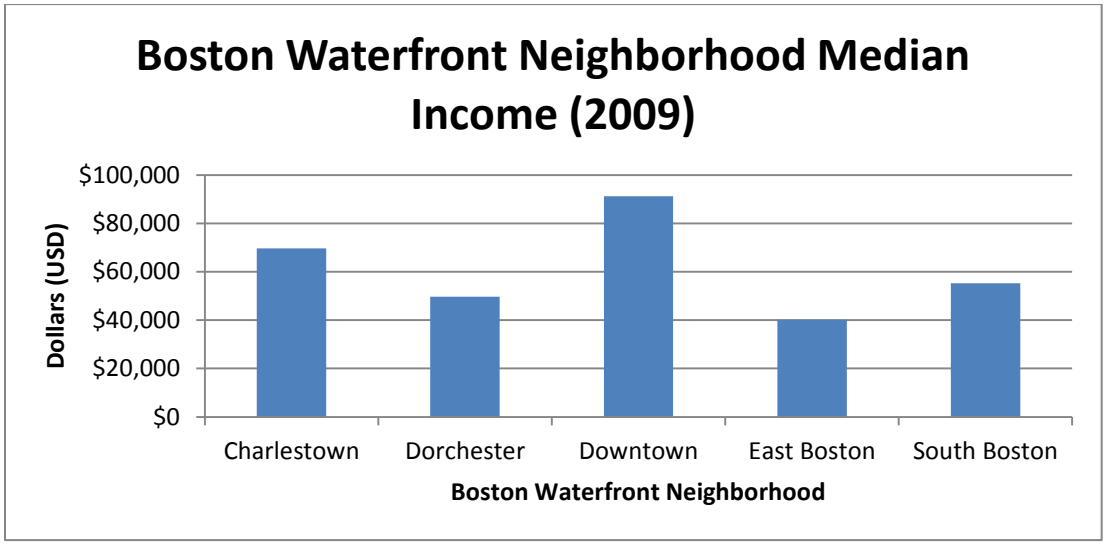

Figure 7 Median income of each waterfront neighborhood

It is generally accepted that areas that are predominately white will have a higher medium income. When compared to Boston waterfront neighborhoods, this trend is still prevalent.

The United States Census Bureau released the most recent census of Boston in 2010. The median income and population density data from City-Data (city-data.com, 2012) was released in 2009. In the time since the release of these data, it is theoretically possible that there has been a significant ethnic, median income, and population density change. This change, if present, would skew these data our team has collected. However, we believe ethnicity, median income, and population density does not change significantly over a short period of time and since these data from the Census Bureau and City-Data are only two to three years old, we do not believe this will largely affect our data.

Demographic Analysis

Below is an analysis determining if there are correlations between population density, median income and ethnicity with the completion and state of maintenance of the Boston Harborwalk. Throughout this analysis, we will be using a Pearson's product-moment correlation coefficient to determine the correlation coefficient of each comparison. Correlation coefficient interpretations will be determined by Table 5 (pathwayscourses.samhsa.gov, 2012).

Table 5 Correlation Chart

Correlation Coefficient	Interpretation
.00-.19	Slight, almost negligible correlation
.20-.39	Low, quite small correlation
.40-.69	Moderate correlation
.70-.89	High correlation
.90-1.00	Very high correlation

Population density. By using StatTools, a program in Excel, we first plotted population density over the percentage of completed Boston Harborwalk for each waterfront neighborhood (Figure 8). These data show that there is a high positive correlation, with a coefficient of 0.794. From Figure 8 we can infer that the more densely populated areas are more likely to have a completely developed Boston Harborwalk. Then by plotting population density over the average of all parcels for each waterfront neighborhood (Figure 9), these data show that there is a moderate positive correlation, with a coefficient of 0.665. The population density of an area may determine a higher percentage of completion, but may not determine the quality of the Boston Harborwalk. We speculate that this is because the more people that reside in an area increase the

demand for public waterfront access. However, the high density of people who use the Boston Harborwalk can contribute to its wear. These data do not necessarily specify the cause for the Boston Harborwalk's completion and state of maintenance, but may be an indication.

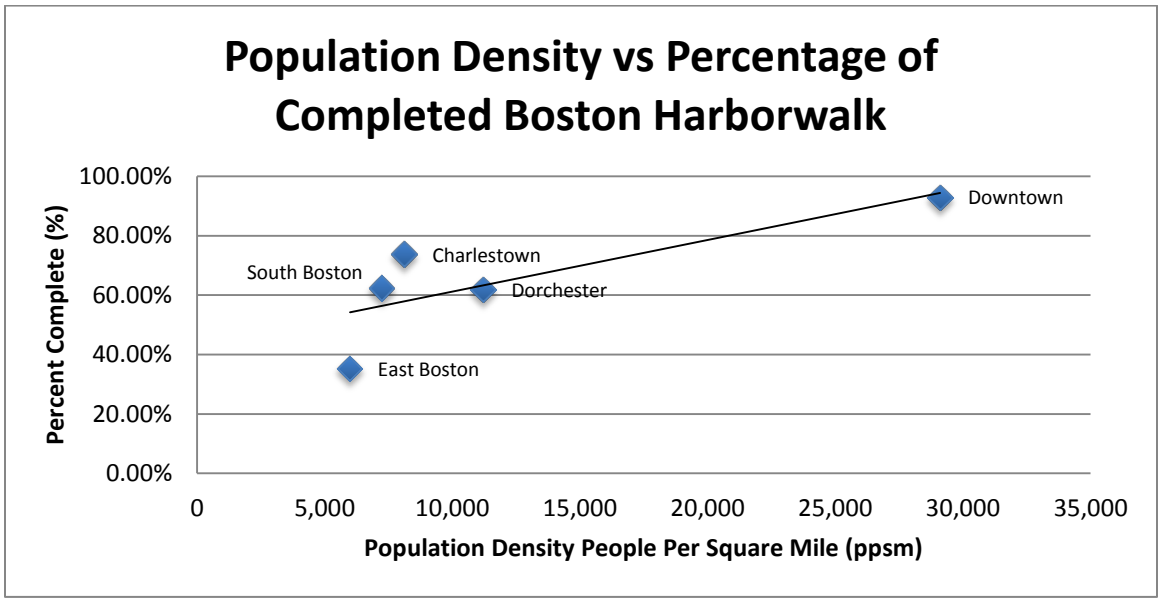

Figure 8 Population density vs. percentage of completed Boston Harborwalk

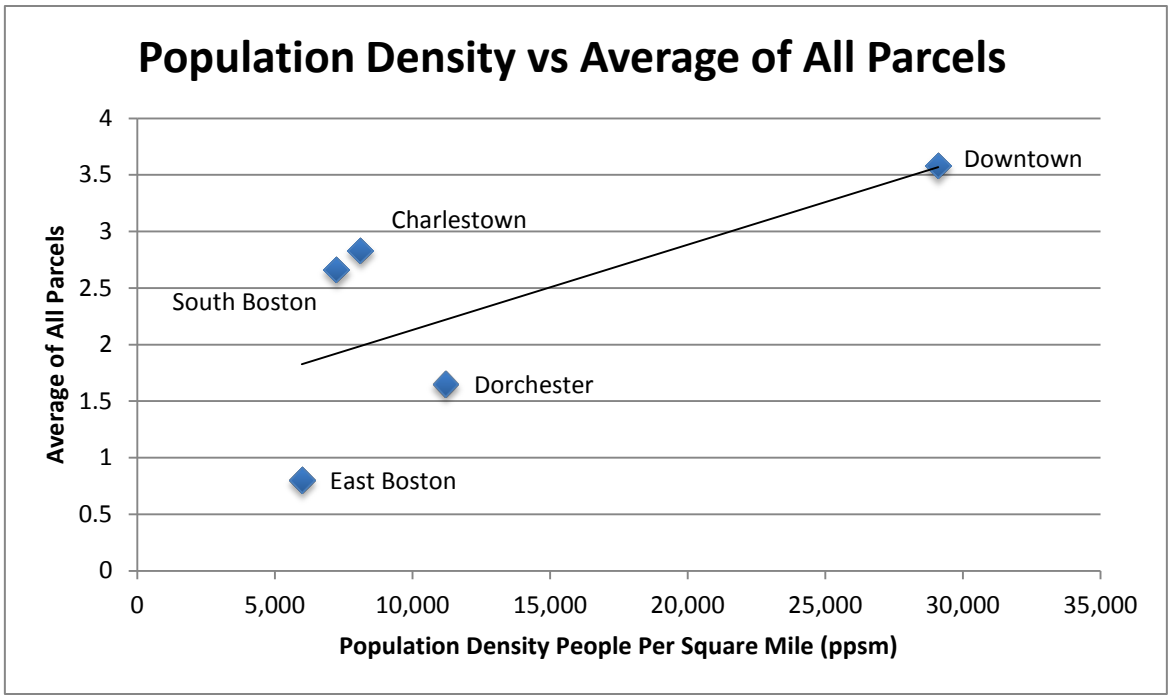

Figure 9 Population density vs. average of all parcels

Median income. By using StatTools, a program in Excel, we first graphed median income over the percentage of completed Boston Harborwalk for each waterfront neighborhood (Figure 10). These data show that there is a very high positive correlation, with a coefficient of 0.953. From Figure 10 we can confidently state that waterfront neighborhoods with higher median income are more likely to have a completed Boston Harborwalk. Then by plotting median income over the average of all parcels for each waterfront neighborhood (Figure 11), these data show that there is a very high positive correlation as well, with a coefficient of 0.922. From these data we can positively make the connection that median income affects the completion and state of maintenance of the Boston Harborwalk. This is due to the significant financial investment that waterfront development requires; therefore, areas with high median income will be more likely to have a completed Boston Harborwalk of quality. From this connection, we can confidently say that, in terms of income by waterfront neighborhood, that there are indications that the implementation of Chapter 91 is environmentally unjust.

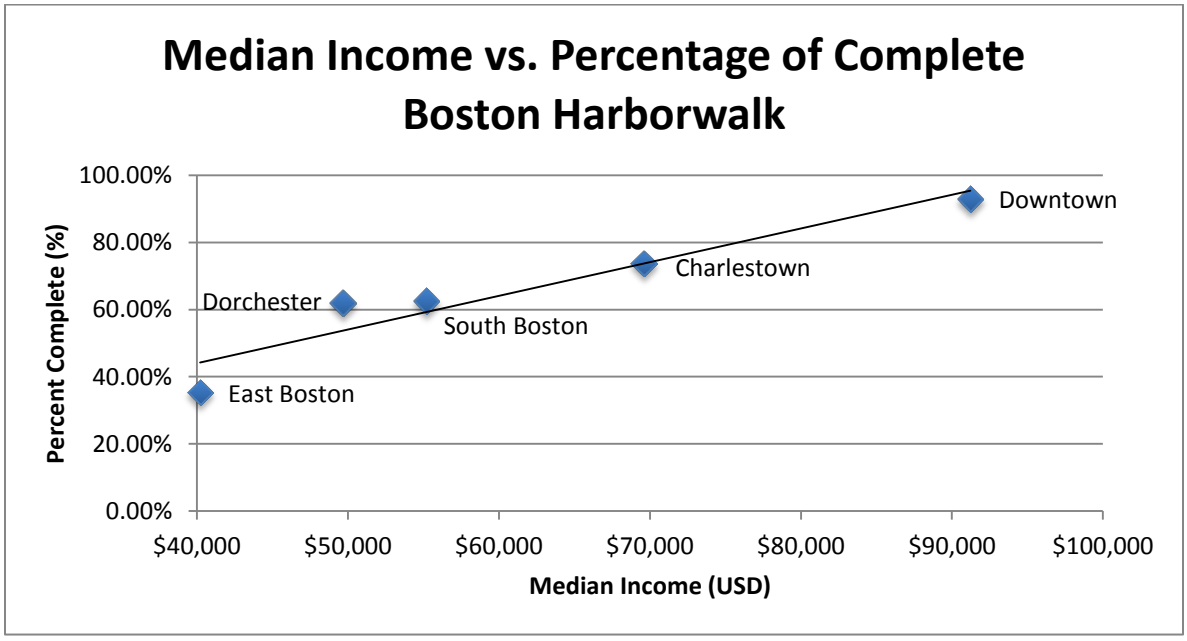

Figure 10 Median income vs. percent of completed Boston Harborwalk

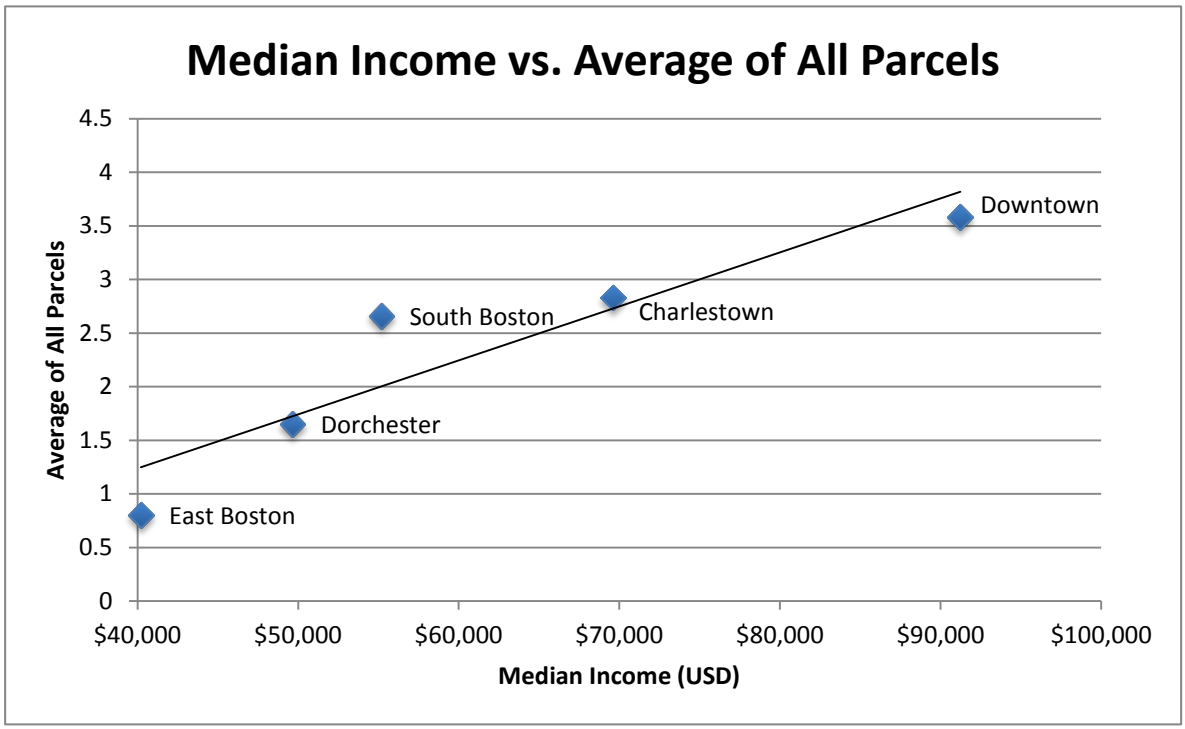

Figure 11 Median income vs. average of all parcels

Ethnicity. By using StatTools, a program in Excel, we first plotted the percentage of white residents over the percentage of completed Boston Harborwalk for each waterfront neighborhood (Figure 12). These data show there is a moderate positive correlation, with a coefficient of 0.563. The graph of the minority population versus the percent complete shows the same data, only inversely. Then by plotting percentage of white residents over the average of all parcels for each waterfront neighborhood (Figure 13), these data show that there is a high positive correlation, with a coefficient of 0.806. From this, we can infer that the ethnicity of a neighborhood does not affect the percent of completion, though it suggests an influence of the state of maintenance of the Boston Harborwalk. It is not logical to assume any ethnicity would be opposed to contemporary waterfront development for public use, as supported through our first correlation. However, we may assume that ethnic groups are less interested in its state of maintenance through lack of use.

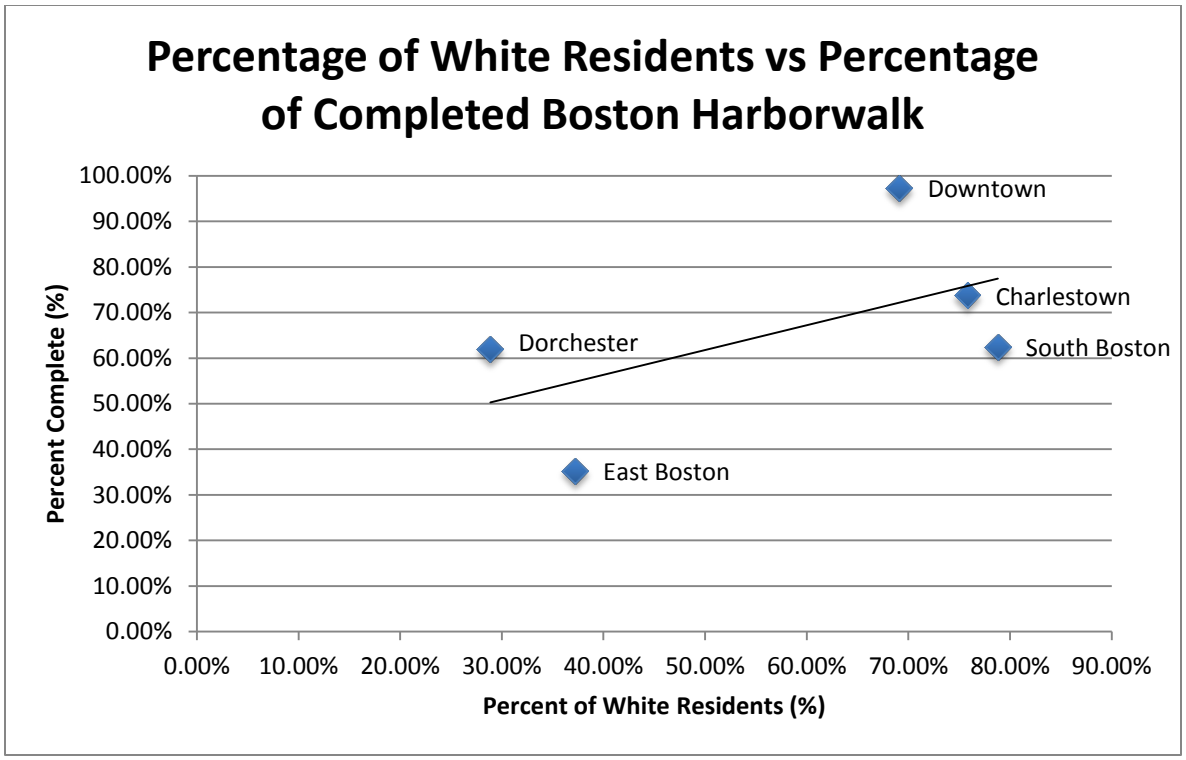

Figure 12 Percent white residents vs. percent of complted Boston Harborwalk

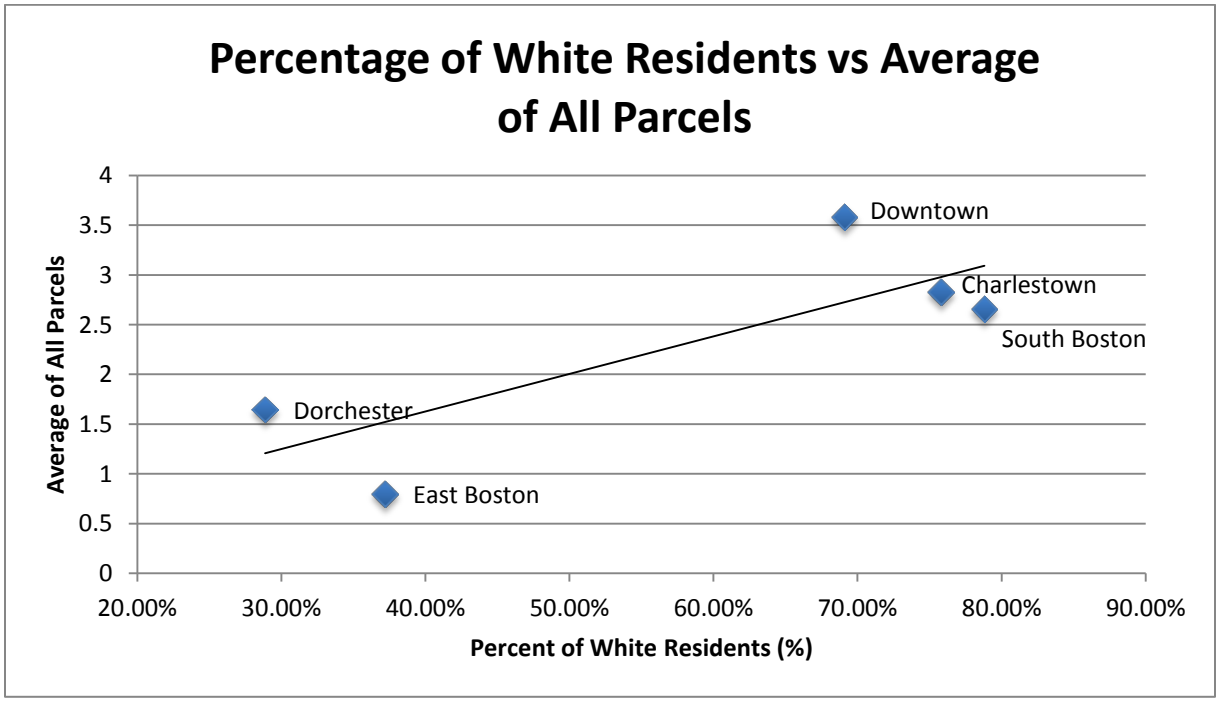

Figure 13 Percent of white residents vs. average of all parcels

Land Use

From the Boston Redevelopment Authority website, we determined the land use for each parcel along the Boston Harborwalk. The land use is categorized into commercial, industrial, public or residential. Parcels that were owned by public agencies such as City of Boston or Massachusetts Port Authority determined to be public land use.

Land use data. The number of parcels and their percentage of land use in each waterfront neighborhood are shown below in Tables 6-10. The complete and incomplete percentages of each parcel are also shown below for each waterfront neighborhood.

Table 6 Charlestown Parcel Land Use

Land Use	Number of Parcels	Percent of Parcels	Complete Parcels	Incomplete	Percent Complete	Percent Incomplete
All	31	100.00%	26	5	83.87%	16.13%
Public	19	61.29%	14	5	73.68%	26.32%
Commercial	8	25.81%	8	0	100.00%	0.00%
Industrial	0	0.00%	0	0	0.00%	100.00%
Residential	4	12.90%	4	0	100.00%	0.00%

Table 7 Dorchester Parcel Land Use

Land Use	Number of Parcels	Percent of Parcels	Complete Parcels	Incomplete	Percent Complete	Percent Incomplete
All	54	100.00%	28	26	51.85%	48.15%
Public	40	74.07%	25	15	62.50%	37.50%
Commercial	12	22.22%	2	10	16.67%	83.33%
Industrial	1	1.85%	0	1	0.00%	100.00%
Residential	1	1.85%	1	0	100.00%	0.00%

Table 8 Downtown Parcel Land Use

Land Use	Number of Parcels	Percent of Parcels	Complete Parcels	Incomplete	Percent Complete	Percent Incomplete
All	37	100.00%	35	2	94.59%	5.41%
Public	16	43.24%	14	2	87.50%	12.50%
Commercial	11	29.73%	11	0	100.00%	0.00%
Industrial	0	0.00%	0	0	0.00%	100.00%
Residential	10	27.03%	10	0	100.00%	0.00%

Table 9 East Boston Parcel Land Use

Land Use	Number of Parcels	Percent of Parcels	Complete Parcels	Incomplete	Percent Complete	Percent Incomplete
All	120	100.00%	23	97	19.17%	80.83%
Public	47	39.17%	15	32	31.91%	68.09%
Commercial	44	36.67%	5	39	11.36%	88.64%
Industrial	4	3.33%	0	4	0.00%	100.00%
Residential	25	20.83%	3	22	12.00%	88.00%

Table 10 South Boston Parcel Land Use

Land Use	Number of Parcels	Percent of Parcels	Complete Parcels	Incomplete	Percent Complete	Percent Incomplete
All	74	100.00%	52	22	70.27%	29.73%
Public	41	55.41%	30	11	73.17%	26.83%
Commercial	23	31.08%	16	7	69.57%	30.43%
Industrial	5	6.76%	3	2	60.00%	40.00%
Residential	5	6.76%	3	2	60.00%	40.00%

The total number of parcels and their percentage of land use along the entire Boston Harborwalk are shown in Table 11. The complete and incomplete percentages of each parcel are also shown below for the entire Boston Harborwalk.

Table 11 All Harborwalk Parcel Land Use

Land Use	Number of Parcels	Percent of Parcels	Complete Parcels	Incomplete	Percent Complete	Percent Incomplete
All	316	100.00%	164	152	51.90%	48.10%
Public	163	51.58%	98	65	60.12%	39.88%
Commercial	98	31.01%	42	56	42.86%	57.14%
Industrial	10	3.16%	3	7	30.00%	70.00%
Residential	45	14.24%	21	24	46.67%	53.33%

Our parcel data was taken from the Boston Redevelopment Authority website. The generalized parcel data information extracted from the website includes the identification number, owner, address and land use of each parcel. The parcel data may not be completely reliable, according to the Boston Redevelop Authority website and does not reflect the most up to date information. Our information concerning the four types of land use could be inaccurate but we do not believe that many land uses would or have changed drastically.

Land Use Analysis

Below is an analysis determining if there are correlations between public, commercial, industrial, and residential land use with the completion and state of maintenance of the Boston Harborwalk. From Figure 14, we observed that for all parcels of land along the Boston Harborwalk, approximately fifty percent of all parcels in a given land use category are complete.

From this observation we conclude that commercial, industrial, public, and residential land use does not increase the likelihood of development throughout the Boston Harborwalk. Also, within the completed parcels, Figure 15 illustrates the average of completed parcels of each type of land use. From this, we infer that the completed parcels of each type of land use are of similar quality, with only a half point difference between highest and lowest averages. Therefore, we conclude that the type of land the Boston Harborwalk is developed on does not indicate a high quantity or quality of development.

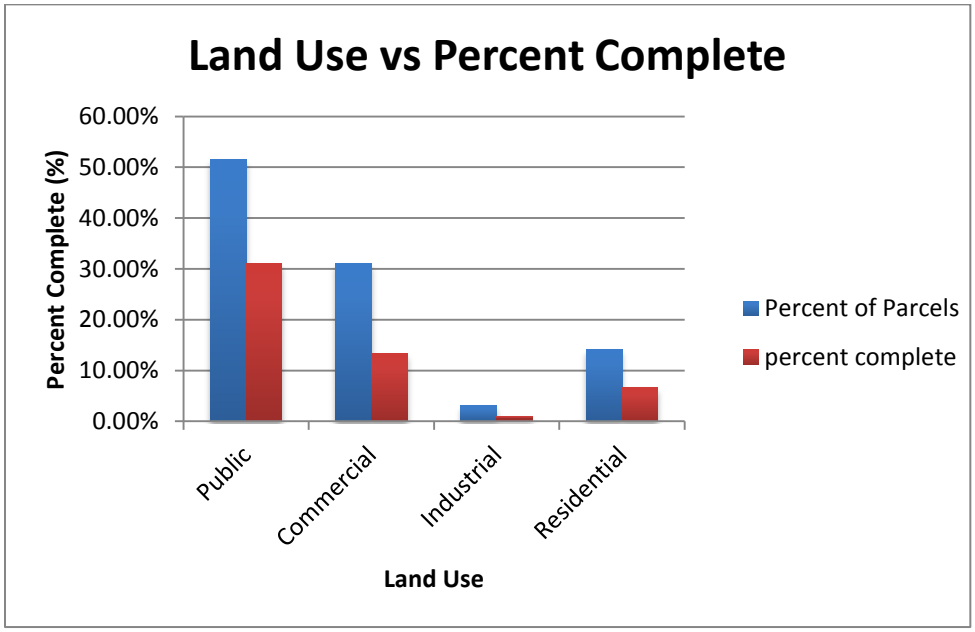

Figure 14 Percentage of parcels of land use and vs percentage complete within each land use

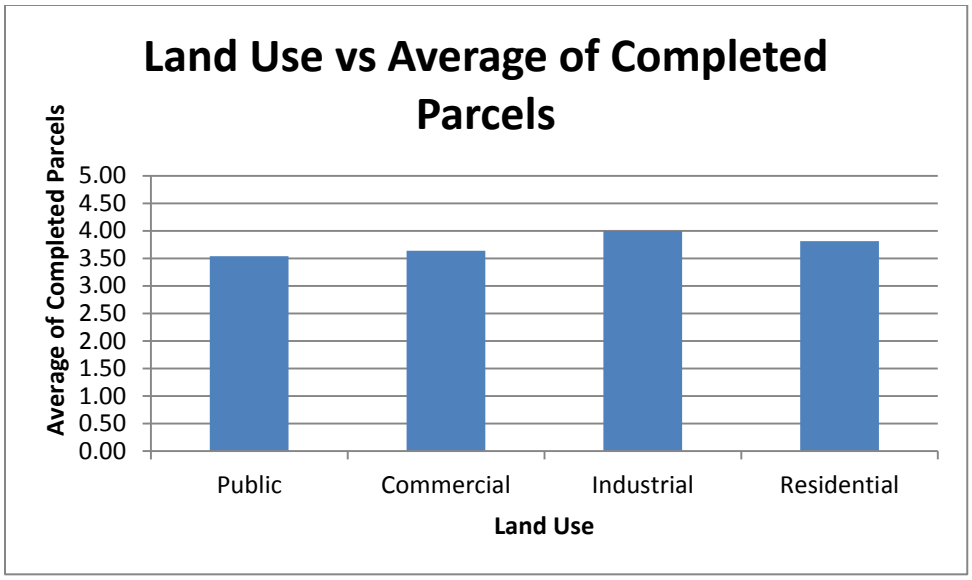

Figure 15 Average of completed parcels of all land use parcels

Policy Analysis

Through interviewing The Boston Harbor Association's board members (Appendix B), we were able to gain insight into the implementation and impact of Chapter 91, which, in essence is a mandated public walkway on private waterfront land. We focused on the board members' professional history with the Boston Harborwalk, their opinion on the different stages of development, their expectations of the Boston Harborwalk and the belief of using Chapter 91. The surveys also added depth to the impact of the Boston Harborwalk on property managers and the public. After receiving only eight surveys from property managers, we concluded that it would be difficult to authoritatively state the impact the Boston Harborwalk has had on property managers. Also, since our group was constrained by time to organize, distribute, and collect surveys, we did not manage to effectively learn what property managers felt were the pros and cons of having the Boston Harborwalk on their land.

We learned from interviews of the Boston Harbor Association's board members that, in their opinions, Chapter 91 is an effective policy in the implementation of the Boston Harborwalk when compared to other considered policies such as eminent domain. According to Boston Conservation Commission chairman Jamie Fay, this method saved the city and state "hundreds of millions of dollars in public expenditure" (personal communication, September 27, 2012). About half of the waterfront property in Boston is owned by public agencies. Having to pay for the construction of the Boston Harborwalk and the amenities that go along with it would have

been too much of a burden on the city or state. Also, the city or state would be the ones to maintain the entire walk, thus making the public agencies financially responsible for maintenance.

According to two Boston Harbor Association board members we interviewed, the Boston Harborwalk is beneficial to private owners because it can be looked at as an additional attraction to their land. Lorraine Downey, an activist who was instrumental in the creation of the Boston Harborwalk, cites that waterfront property owners thanked her for her assertiveness regarding implementing the Boston Harborwalk on their land even though they opposed it beforehand (personal communication, September 18, 2012). Since individual property owners are responsible for developing the Boston Harborwalk on their property, this leads to the Boston Harborwalk being non-congruent in appearance. However, the non-congruency of the Boston Harborwalk provides an intrinsic benefit when viewed as a whole. Having different developers and architects creating their own portions of the Boston Harborwalk ensures that each parcel is unique. This diversity brings character to the Boston waterfront, which we believe would have been absent if the state or city developed the entire Boston Harborwalk.

From surveys we learned that the Boston Harborwalk has a positive impact on commercial and residential waterfront properties. An analysis of the returned surveys indicates that several waterfront property managers have a positive view of the Boston Harborwalk. The Boston Harborwalk enhances the tangible asset of a waterfront location due to increased public access.

One of the disadvantages of this policy is the absence of an end date for when the Boston Harborwalk will be complete. A waterfront property owner is not mandated to build their portion of the Boston Harborwalk until he or she develops their land. This allows property owners the option to delay development on their land, thus delaying the development of the Boston Harborwalk. According to The Boston Harbor Association President Vivien Li, it is often the case that private LLCs will buy or have bought valuable waterfront property expecting to sell it five or ten years later when demand goes up in a particular waterfront neighborhood. This is an example of how the Boston Harborwalk can be slow to develop in neighborhoods which have low waterfront property values. However, it is extremely unlikely that a property owner will delay development on their waterfront land just to avoid implementing a Boston Harborwalk path.

Another disadvantage of this policy is that we have found indications of it to be environmentally unjust in its implementation. Chapter 91 could have been implemented in a way that better provides low income and minority neighborhoods along the Boston waterfront for access to natural resources, funding, and open space, thus conforming to Massachusetts' policy of environmental justice. We found that when comparing the most and the least developed waterfront neighborhoods, Downtown and East Boston respectively, there is an evidence of a violation of environmental justice. Referring to Table 8 and 9, we observed that a much higher percentage of public land has been developed in Downtown than in East Boston. In Downtown, eighty-seven percent of the sixteen public parcels along the Boston Harborwalk have been developed while thirty-one percent of the forty-seven public parcels in East Boston have been developed. We believe that this is most likely due to the fact that there is minimal investment in East Boston due to its low median income (Figure 7) and high percentage of minority residents (Figure 5). In conclusion, we believe that the implementation of Chapter 91's policy is potentially in danger of being environmentally unjust.

Chapter 5 Conclusions and Recommendations

In this closing chapter, we will describe the conclusions that we inferred from our data analysis in chapter four. Additionally this chapter will include recommendations to The Boston Harbor Association so they may complete the Boston Harborwalk.

Our first conclusion is that the Boston Harborwalk is approximately sixty percent complete with a total of forty-three miles. However, The Boston Harbor Association believes the Boston Harborwalk to be eighty percent complete and forty-seven miles long. We believe that this discrepancy stems from the maps which The Boston Harbor Association uses to indicate complete and incomplete sections. We recommend that The Boston Harbor Association take the following actions regarding the Boston Harborwalk:

- Take into consideration our inventory to reevaluate total length and the percentage of completion
- Create new publicly available maps for each waterfront neighborhood using our data to improve the accuracy of the complete and incomplete sections
- Use the Geographic Information Systems map we created to investigate areas that are in a poor state of maintenance so that they may ensure the upkeep of these completed sections
- Use the inventory and Geographic Information Systems map we created as a base to expand the list of amenities

Of the demographic factors we considered for analysis, we concluded that median income is the most prominent factor in the completion and state of maintenance of the Boston Harborwalk, contrary to our hypothesis. First we found that the completion and state of maintenance of the Boston Harborwalk is directly proportional to median income. Also, we found that population density of a waterfront neighborhood suggests a positive effect on the percent of completion of the Boston Harborwalk. Lastly, we found that the ethnicity of a neighborhood suggests an influence on the state of maintenance of the Boston Harborwalk. In terms of land use, we concluded that it does not necessarily determine the completion and state of maintenance of the Boston Harborwalk, which is also contrary to our hypothesis. This is due to the fact that each category of land use is approximately fifty percent complete. We recommend that The Boston Harbor Association research the demographic and developmental

trends of the Boston Harborwalk. The purpose would be to investigate if residents of waterfront neighborhoods are being given fair access to open space and funding concerning the Boston Harborwalk.

Based on our surveys, we also conclude that Chapter 91 is successful in certain aspects of its implementation. Overall, property managers from most waterfront neighborhoods believe that having a section of the Boston Harborwalk on their property is beneficial due to increased foot traffic and public exposure. We also found that Chapter 91saves tax payer's money because it is a less expensive alternative than buying the waterfront land or seizing the waterfront through eminent domain. To further the study of the implementation of the Boston Harborwalk on private land, we recommend that The Boston Harbor Association take a complete inventory of all businesses along the Boston Harborwalk. Then using that inventory of businesses, expand the survey pool to include all types of land use in order to ensure the validity of the results.

However, there is indication that the implementation of Chapter 91 could be environmentally unjust. This is most apparent between the neighborhoods of East Boston and Downtown. East Boston, the area with the least amount of development, has the lowest median income. Conversely, Downtown, the area with the most amount of development, has the highest median income. Also, the majority of the land in East Boston is publicly owned, indicating that there is an underinvestment in the development of these parcels when compared to other waterfront neighborhoods. If this is proven to be true, this would represent a violation of Massachusetts' policy of environmental justice. From these conclusions on the policy of Chapter 91and environmental justice, we recommend that The Boston Harbor Association take the following actions regarding the Boston Harborwalk:

- Research Chapter 91's policy of implementation to see if it is environmentally just
- Consider creating a list of standards for each property parcel to ensure consistency throughout the Boston Harborwalk
- Allocate more public funding towards the completion of the Boston Harborwalk in low income waterfront neighborhoods

Our final conclusion is that these data we collected can be used as a starting point for evidence that may indicate the presence of environmental injustice, thus creating pressure to expedite the completion of the Boston Harborwalk. Although nobody can force property owners

to develop on their land, these data we collected provides insight to the Boston Harborwalk's current completion and state of maintenance. In the near future, we hope that the Boston Harborwalk will reach its completion.

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Appendix A: Waterfront Neighborhoods

The following are outlines of the waterfront neighborhoods of Boston. This information is taken from City-of-Boston website.

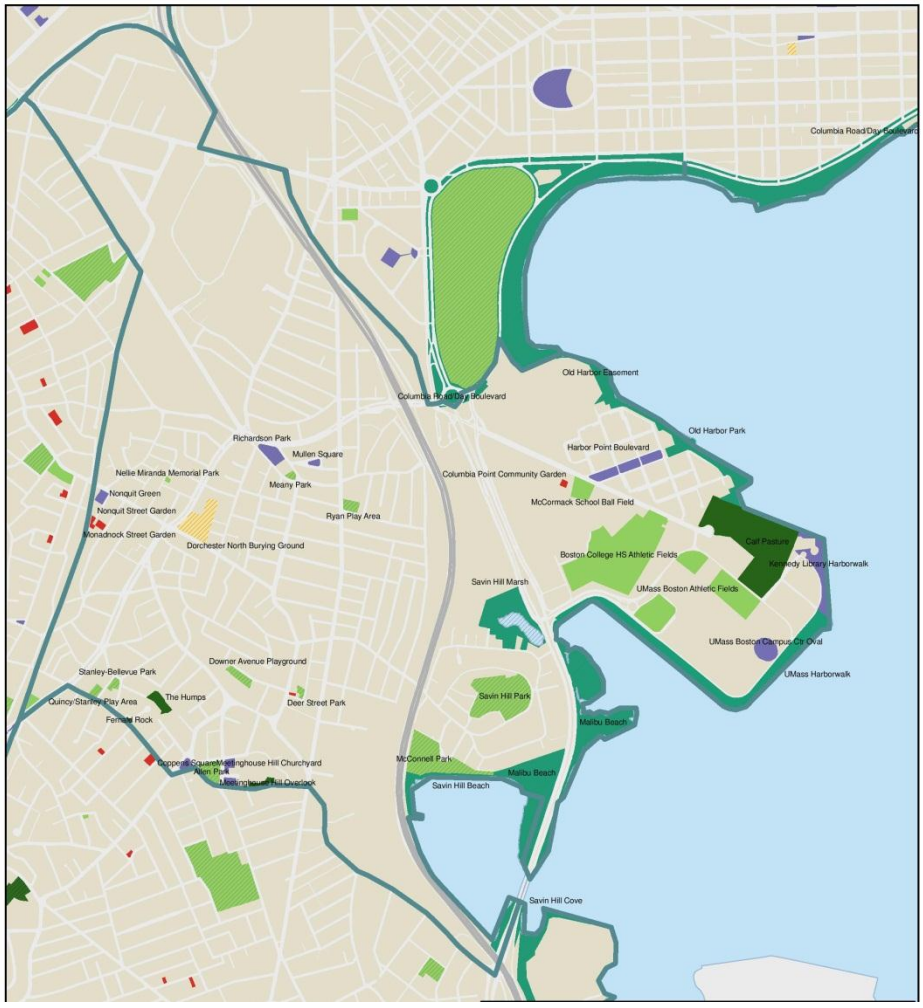
Charlestown:

Located between the Mystic River and the Charles, Charlestown is located north of Downtown Boston on a peninsula extending southeastward.

Dorchester:

Dorchester is the largest and most populous neighborhood, so often, for demographic purposes Dorchester is split into North Dorchester and South Dorchester. North Dorchester includes the portion north of Quincy Street, East Street, and Freeport Street. South Dorchester is bordered to the east by Dorchester Bay and to the south by the Neponset River.

North Dorchester



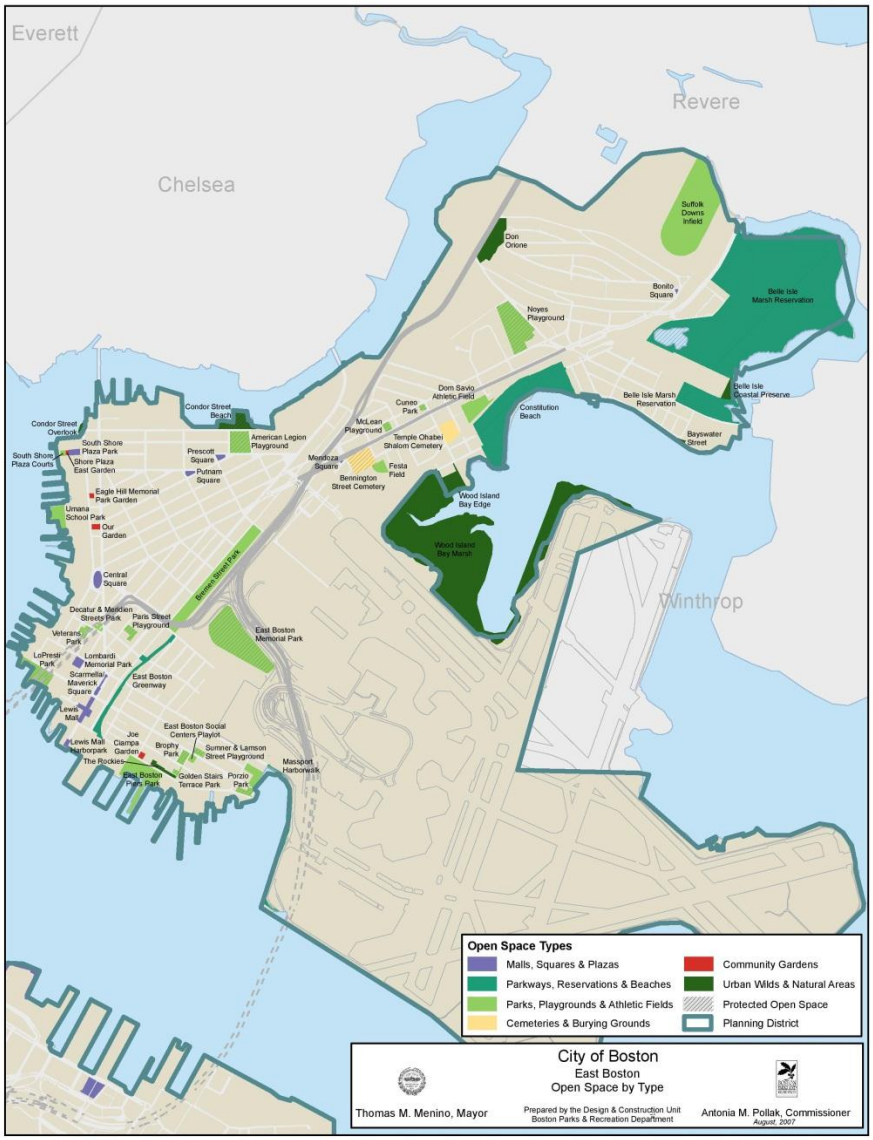
South Dorchester:

Downtown:

Includes the financial district and the North End of Boston.

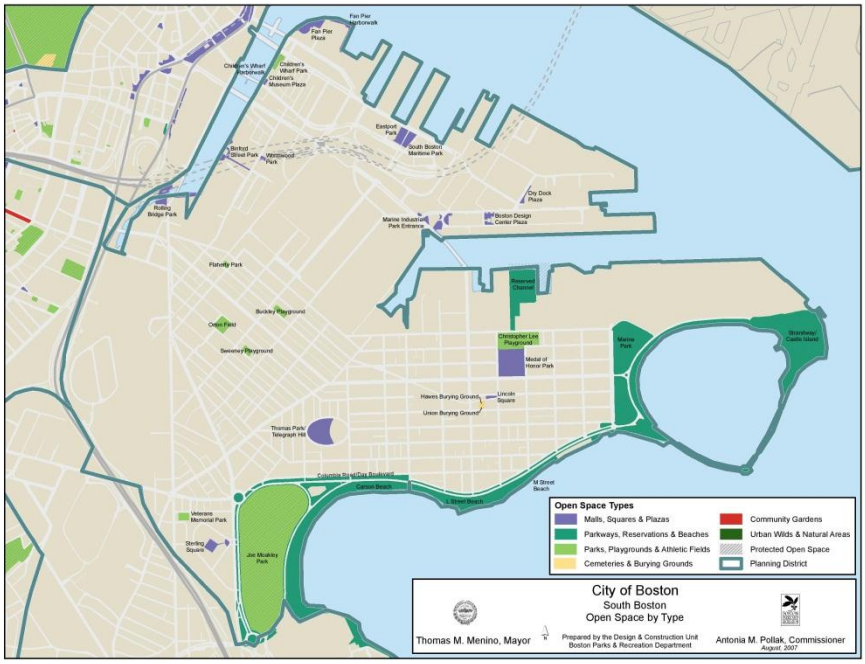
East Boston:

Created by connecting several islands, East Boston is separated from the rest of the city by Boston Harbor and bordered by Winthrop, Revere, and the Chelsea Creek.



South Boston:

Includes south of an all of Fort Point Channel and next to the Dorchester Bay.



Appendix B: Interview Transcripts

Lorraine Downey Interview Transcript

September 18, 2012

D is herein after referred to as Devin Mulcahy, and L refers to Lorraine Downey.

D: Going out to the individual, each portion of the Harborwalk, in the individual property parcels, and then we have like a grading rubric, and then we grade each parcel in each district.

L: Okay. According to what? What's your grading based on?

D: We worked it out with Julie before, so we came up with a bunch of ideas of data that we think would be relevant, so actually… (shows excel sheet on ipad) so the type of walk way you would use, whether it be boardwalk or brick or concrete or gravel, the amount of lighting, the amount of seating, public restrooms, public art, and so on. For our school WPI, we would have to write about some social aspect.

L: What is WPI?

D: Worcester Polytechnic Institute.

L: Oh yeah. Yes. I should have known that.

D: We have to write about a certain social aspect. So the basis of our social aspect for this project is going to be how the public interacts with the Harborwalk and then the Harborwalk's effect on property owners because the public walkway

L: It's a sidewalk

D: Yes, it's a public walkway through private land. So we were wondering if, pretty much, just to start from the top, what was your general experience in getting the Harborwalk developed and seeing it through its completion?

L: Okay, I go way way back. Before the Chapter 91 laws were changed. The Harborwalk really started using the Wetlands Protection Act. Permit chapter 131 section 40 of the Mass general laws. That law in it in itself is supposed to protect several of interests. I can't remember them all, public and private water supply, storm damage and flooding, fish, shellfish, there's two more, I can't remember, anyway, I started working as the executive secretary to the conservation commission for the city of Boston in 1977. At that point in time, chapter 91 wasn't used by the state at all. The only public rights were fishing, fowling and navigation. The Wetlands Protection Act was written to protect wetlands. We didn't have any, we were a built waterfront, the only wetlands we had left in the city were Belle Isle Marsh and Neponset Reservation, they were

already protected. They had already taken them over. So I was trying to figure out, how do I stop illegal filling of the waterfront, when no one can really get to the waterfront and see it. So I think one of the first places I tried to pull back from the waterfront was at Union Wharf. And this is before the buildings were built there, it was a parking lot. And the strategy I used was generally thinking that oil and grease that drips from cars, asbestos from brakes, all of that stuff, is on the ground, in a parking lot. And when it rains, it's running right into the waterfront water. So my idea was if I pulled them back from the water's edge, and have a buffer there, at least the water will be able to run through the ground and the ground will filter it a little bit. Even though they weren't wetlands, it was still ground. So I started and I made them pull all of the parking 5 feet.
D: From the edge of the water?
L: From the edge of the water. It was a __? thing, alright? So it was all this rubble and everything and I pulled it back and they couldn't park cars in this 5 feet. So that's where the idea started. And then one of the next developments where they needed a permit from me was at the corner of, I always call it the ____? There's one right down the street here on across from the milk bottle. That building was going right to the water's edge. And on the other side coming from Summer Street there was a stairway down and it was a restaurant at that point in time, in that lower level. And then if this building had been built, the walkway would have just ended at the middle of the channel, so I put a condition in, that said, and the way I figured out how wide it was going to be, I took a gentlemen that was still on our conversation commission I think, john lewis, a very tall man, and I measured his shoulders, and then I multiplied that by 4, and then I added 2 feet to it, and we came out to around 8 feet. So I wrote the condition in that they had to have an 8 foot setback for the first floor of this building to be checked, the walkway from congress to summers. And I wrote that in the conditions and the developer called me after he got his order and he said you can't do that. And I said basically, well you're right I probably can't. Because it's really not one of the conditions, I'm rationalizing that it's protecting the conditions, but you know if you appeal me, you might win. I said, but it's going to take you minimum of 6 months and he can't go after his other state permits and federal permits until he gets that. So he chose to put the walkway in.
D: Is it also he would have to spend money in that time pursuing the appeal, is that an aspect of it?
L: Would we?

D: Would he, when he's appealing your…
L: Of course he would. And it wouldn't be a lot of my time, because it would be on just a first level, it would just be me. So it's not going to cost the city. So anyway, he didn't appeal it, he built it, and he called me up afterwards, and he said thank you for doing that. You know because he said I didn't realize how incredibly valuable that connection would be. The next people I happen to is the Bane building which is the building right next to the coast guard. It's between the Rose Wharf and the coast guard. This was before Rose Wharf was built. So Rose Wharf was just a bunch of derelict piers that mass bay operated out of. So then the coast guard building didn't have the stairway open coming from the bridge down. So this was an isolated piece and there was no way of getting to it from this side and no way of getting from the other. Again we made them do it, and they built it, again the owners came up to me afterwards and said thank you and they said, and it stuck in my head, they said you know this what we really want from the public sector. We want them to think 20 years, 50 years ahead of time because all of Harborwalk, I knew the city wasn't going to cough up any money for this. And I was going to have it done on the backs of the owners who was on the waterfront at the time. And that's what I was doing. And then at the same time our law department was appealing a directive on Lewis Wharf. A whole decision on Chapter 91 got changed based on that to add the public's interest as a law.
D: So the Lewis Wharf's Statutes?
L: Triggered actually a court case that changed Chapter 91 regulations to include the public access issues. But we started it before that. You know what I mean, kinda blackmailing people, with Wetlands Protection Act. As a matter fact, the mayor at that time, mayor Flynn, I saw him a few months ago at something, and he looked at me and said, "Lorraine" he said, "we thought you were crazy, but we just let you do it" and he says, "look at it now" and it makes me very proud that we got to that point. It was using a tool, to do the right thing, to me it's a perfect example of what's the public sector should be doing. Because it's what the people wanted. They wanted the access.
D: So going off of that, different neighborhoods have developed their Harborwalk portions differently, a lot of the examples that you just cited were more North End, Downtown, Seaport. So I wanted to get your opinion about what other, you could say, lower income districts, such as East Boston or parts of Dorchester and how those have developed differently.

L: When I think about Dorchester's waterfront, which is where I born and brought up, a lot of it, was kind of publicly owned that we got access to. I'll just give you one little background story that happened at the very beginning too, it was illegal fill going on, technically it wasn't illegal at the gas tanks. A piece of property, then we called troy's fill, but now it's called victory road park, it's the … prints that you can see on either side of the express way.
D: Yeah we were there the other day
L: Okay, well the history of that, it was this judge, at the Dorchester court, troy was his last name, he had gotten a permit to fill that from the state division of water ways, but he was supposed to drive sheething? Down. He was taking the church, this was kinda the same time that they were redoing the west end, they were taking down all the buildings and the Charles street towers, or whatever they called them. Charles river park was being built. So he was taking the silt from that, he had made a deal with some of the construction, and they were dumping the silt in at troy. He never put the sheething down. So the marina that was there, took him to court. Taking a judge to court is not an very easy thing. So troy kept getting delays and delays and delays. Meanwhile, the fill is dumping in and blocking the channel and blocking the boat sails?, so this is going on, and it just keeps getting constantly delayed because he has all the contacts. Coastal zone management had just started. And they didn't know what to do in Boston Harbor so they spent all their time in other areas that were easier. And they had some pilot money and so they called me up one day and they said they were having a real hard time in Boston. And so they said if you had one problem to solve along the waterfront, what would it be? And of course I said the troy's fill. Because it was a standing order that said to remove the fill, but troy kept getting …because of those delays. We did a study, I hired an engineering firm, they gave me the money to hire an engineering firm, and we wanted to determine whether the fill should stay there and become public land or if it doing too much damage and needed to be removed. The determination of the engineering study was that it had done all of the fluffing that it was going to be doing, and that if you did try and remove it, it would cause much more damage. So the decision came down, the report went to court, and the decision was made that the fill stayed there, but it has to be turned over to the state as a park plan. So that took about actually 20 years between the time the study was done to get implemented into a park. By the time enough city money came and stuff like that. The other key places along the Dorchester waterfront is like the old Neponset drive in site. Purchased by the state. But that again took a long time. Difficult place

in Dorchester is Point Norfolk. Because everything is built on the water's edge and the building is right there, so it's very hard to do a walkway through a building. It's not a revenue do things area. The buildings aren't that valuable to be able to have them put a cantilevered walkway. And we're just walking to, leading to. That one has always been a puzzle. Yet Harborwalk looked at connecting Neponset drive in under the bridge and then along the railroads for… beach. And then there's a plan sitting somewhere that actually had a walkway kinda cantilevered off of the expressway and then a little bridge over to the end of troy fill. Then you got to figure out how do you do the bridge at Malibu? How do you get there? Originally there was a plan that looked at going under the bridge and around the loop inside Malibu. And then around again to the outside. But there's a couple of pieces there that are really complicated. Then you get umass and kennedy library, those are fine. And then when they did over the public housing, they put in a beautiful walkway in there. You don't get an awful lot of people walking along that section. But it get very good views from the people that are there. South Boston's easy because you got just the whole beaches area, now the beaches are clean, it's spectacular.

D: do you find it more that the demand isn't there, the public use isn't so much there, in areas such as Dorchester and East Boston, that they don't get the attention to development in sites such as the North End do?

L: The issue is more that you don't necessarily get the improvements in those places unless the development is happening. There is less space for the development to be happening there. And it isn't the higher scale, you can still get the connections when the development happens, but not a lot is happening in those areas as opposed to downtown and the South Boston waterfront, everybody's there now. East Boston is a little iffy, but East Boston will be spectacular one of these days, but the development is happening at a much slower rate over there than it is here.

D: Do you see it as once Downtown, North End, once that is developed, is the Harborwalk going to move out from there?

L: Oh I think so, I think people have already discovered East Boston, give me a break, this is the best views of Downtown Boston, and the sunsets that you get. East Boston you get the sunrise and the sunset! It's just spectacular. But one of things that I have noticed, and I have lived in the city my whole life, is that, as much as we love our harbor, our harbor is also a barrier. Which is why the water transportation is so so important to connecting the harbor. Now granted to East Boston, public transportation, you got one line, the blue line, originally we had one tunnel, the

summer tunnel. And it was always backed up. Now we have two tunnels, but that still, unconscious barrier. When you look at Charlestown, you have two bodies of water. Actually three, you got the Mystic, Boston, and a bit of the Charles river. So it's isolated, somewhere in our brains, people see that water as a bit of a barrier. Because you can't just cross anywhere. You have to funnel yourself into where the bridges are or where the boats and ferries are to get out. So I think inherently, as much as the water is a value, it's also a bit of a barrier. And it's slowing stuff down. But it's going to happen. I started the Harborwalk in 1977 with the wrong permit, and it took us what, 40 years now going on 50, and I knew it was going to be 50 years because it wasn't done on the public sector dime, it was done on private dime. We're 85-90%, it's guaranteed now, nobody is going to not build it, because it's too much value to the developers. And the developers have totally changed, their attitude about public access because originally they were afraid of it. They didn't want it at all. I mean, people told me, what do you mean, people are going to walk by and look into my windows? And I said yup, it's called a sidewalk and they can deal. Because my concept has always been, it's just a sidewalk along the highway of the water. I don't know if that helps you or not.

D: Yeah, that's a good concept. So at first you had to bring the developers, kicking and screaming, into doing this, but then, once they've had to live with it for a while, you would say their attitude has been…

L: Oh, it's a benefit for them. Adds value.

D: So this is my last question for you: When you first started out, what was the difference between the what you were expecting to get out of it 10-20 years down the road to even today, versus what happened. Did you meet all of your expectations or is there something you still want to do?

L: My expectations of the uniqueness of the different locations has been good. One of the things that I didn't want to have happen is, I didn't want it to be exactly the same design guidelines on every development. Because that's what some people were asking for. I wanted the architects of the building to incorporate the concept of the public access. I mean we have certain dimensions and consistency in the signage, but more than that, I wanted you to be able to walk around the corner and discover something else, something unique. So we didn't want a design common thread through it. The commonality that I wanted was that you could walk along the edge everywhere, and benches. But I didn't want to tell you what the benches had to be. In some

places they could just be granite flats, and they work. And that's what it should be there. In other places, like in the intercontinental, these beautiful benches and things like that. So that part I'm very happy in how it's turned out. I wish there was more activation between the land and the water. I wish there were opportunities like rose wharf garden. With its weekly, I don't know if you got to spend any time during the summer, but they put that blues bar in the water. On Tuesday night they had soul, on Wednesday night they had swing, they had blues and Friday they got the movie which to me meant the whole real intent of what we were trying to do with the harbor park advisory committee and activating the waterfront. Not only did they have the tables where you can sit down and order food and all that, but they give you cushions and you could sit on the stairs for free. So a family can come in on a Friday night, with their kids, bring their sandwiches and drink and sit on their stairs and it doesn't cost them anything. The ICA, has concerts on Thursdays night. We need more of that stuff. And not all the same thing, unique and different, it needs to be more places that activate the waterfront. That you could rent a kayak or a paddleboard and paddle in the fort point channel. And my understanding is that there isn't enough demand for it yet. For somebody to go in the business. It's one of those chicken and egg things. What comes first? I saw some people due to new public landing, free, and they did it beautifully because of parking spaces right on fort point channel, that people canoes at night and weekends. And I was walking along there on a Sunday afternoon. And this couple was taking their kayaks out. And have their car, with the rack and the two kayaks on it, and all of that. I was talking to them and they were from ??, and they came in here. Now I thought that was very very cool that that was happening, but I'm looking around and saying, yeah they have a house concuit so they can store their kayaks, and they have a car with a rack on it so they can move it, how somebody who lives in the north end, who doesn't own a car, had no ability to store something anyplace, how do they have the opportunity to do this in the harbor and we don't seem to have any places for those kinds of recreational activities around the harbor yet. It's where the water meets the land and how do you activate that for things for more people to be able to use it and then the Harborwalk becomes the real melting ground for people of all nationalities to be able to enjoy. It's for all ages!

D: So do you view it more as a if you build it they will come, or the demand has to be there for…

L: I'm one for if you build it they will come, which means you will somehow subsidize these things

D: So that would be a state subsidies or..

L: Well I don't know why, all the Chapter 91 license for a lot of these developers, they're putting a lot of money into this big pool, a lot is for water transportation which is very important, but why can't they spend a little of it on subsidizing at least summer time and try these things out. Maybe it's money that goes into ??? for different proposals.

End interview

Jamie Fay Interview Transcript

September 27, 2012

M is herein after referred to as Molly Mioduszewski, and JF refers to Jamie Fay.

M:We're doing a project for WPI with TBHA, and were making an inventory for them of all the amenities and the state of the Boston Harborwalk. We also want to get an idea about how a public walkway on private land is perceived. So the first question we have for you was what was your experience during the development of the Boston HArborwalk?

JF: well my experience goes back a long way, I really started when around 1985 I guess, when Boston was first putting forth the concept of the Harborwalk. And it was part of some planning they were doing for the waterfront that eventually became the Harbor Park zoning, was adopted about 1990 and covered most of the waterfront from Neponset to Charlestown, which is ya know the majority of Boston's waterfront. With the exception primarily of East Boston. And they had a harbor park advisory committee set up at that point in time which was a bunch of citizens who reviewed proposals for projects along waterfront and you would go in front of the harbor park advisory committee and they would have a hearing on your project and tell you what they think, and they were pushing very very strongly for public access and, and the problem is you cant actually require public access through zoning, so zoning can regulate land use, height, dimensions, things like that, and they were doing that……and they were creating a space for Harborwalk, by requiring buildings to be set back a certain distance from the edge of the water. But they couldn't force it to become public, in any case its private land, so they were really struggling with that, like how, cause this is a vision they had, they wanted to make it happen to have people be able to walk on the waterfront, but um because of the way Massachusetts laws are, they couldn't actually require that through zoning, so they were trying to figure out another way to do it, so what they did is they worked together with the Chapter 91 program, you guys

familiar with that at all? So that actually does allow the state to require public access even though local zoning does not, so they kind of worked hand in hand to put together this zoning overlay district to the waterfront that kind of incorporated some of the requirements from Chapter 91 and between the two of them, they were able to get um a lot of um.. parcels of land on the waterfront that were not open to the public, so back in ya know like, in the mid 1970's is when people started thinking about, would it be cool to live on the waterfront in downtown Boston, because up until then it was all industrial, run down buildings, brick warehouses, all this kind of really gritty stuff, chainlink, fences, you wouldn't go anywhere near it, you know you would not feel comfortable in that area. Then is started to be abandoned, so there was a lot of very unutilized properties, so the city came in through urban renewal and took some of those properties, like creating Christopher Columbus Park and places like that, there were still a lot of properties that were not really…um they were very industrial in character, so developers started to buy them up, some of these old warehouses on the waterfront, and convert them to condos, and I remember in like in the mid 1970's when I started working in Boston, everybody is talking about so and so who bought this condo down on the waterfront, can you believe ya know they paid like $65,000 for a condo in an old… building how silly and ya know and of course they are worth a million dollars now so um but they were like pioneers right, the people who… and you would find those same kind of people like in pretty much and kind of pioneering area where new development was happening ya know, the young urban professional people without kids go ahead and buy, ya know they are hope its going to increase the value or whatever, well now they are all like retired and still living there ya know, but um, so but they were created, they were almost like islands because they were in an area that was really run down, and was really not very nice and not very safe, and so each of these wharves would get redeveloped but there would be like nothing on either side of them, and so they would put up fences and gates cause they wanted to keep their property safe and keep rifraf out or whatever so, that's kind of the situation that was on the waterfront in the early 1980's and so the Harbor Park zoning was trying to reverse that and say no we don't want these properties walled off anymore, we want them open to the public, and by opening to the public actually they become safer than if they're just gated off, so that was the challenge and it was a real big challenge, and it was a real effort to create a different kind of mindset about the waterfront and that the waterfront should be open to the public, and they had through some court decision in 19, uh early 80's lates 70's, there were some

court decisions then a piece of legislation in 1983 that created the public right of access along the waterfront, so that combined with Harbor Park zoning in 85 and late 80's turned into this kind of the plan for the waterfront in 1990, so it took a long time, took really a decade of hard work to kind of get the framework in place, and since then its been incremental as each project comes along they've been required to buy public access so the Harborwalk is only happening a piece at a time, and you don't really have control over when each piece happens cause you have to wait till somebody wants to change something. If they don't change anything then you don't have any right to require them to build a Harborwalk. So you know that's kind of the dilemma, where as in other states where the state or the public actually owns the waterfront they can go in if they can get the money they can spend the money and build a Harborwalk. So like in California all of the shoreline is public and is owned by California, but it is also paid for by California. So they come in and they build it, and its open to the public and they maintain it. Where as here we have a different situation where all the investment is actually coming from private parties, and the maintenance system by private parties. So that kind of how we got to this point, and we are getting close to a good amount of the Harborwalk being done but there is still a lot left particularly in East Boston.

M: Why do you think different neighborhoods are in different developmental stages of the Boston Harborwalk?

JF: I think some of the answer to the first question, is the answer to the second one. Which is you know until private development happens you don't get a Harborwalk so in all of East Boston there is really only a 100 feet of Harborwalk. I have been very active, I have been working there for ten years trying to get a lot of projects constructed in East Boston. There are, I know probably 12 or 14 hundred housing units that's are proved or in various stages of approval and none of them have been built. So actually there is a story in todays Boston Herald, if you want to look at it, about the first new project that will be built in East Boston, but I started working on that in 2000, it's been 12 years. They actually started construction in 2007 or 2008 and had to stop because or the real estate crash. But now they are going to restart it. So that will be the first building and you hope, that is about 176 housing units, another building and another building and another building will come along and eventually the whole East Boston waterfront will be developed, and that those pieces of Harborwalk will start to connect. So East Boston is probably the least accessible part in any part of the city. But there are still problems in other sections, and

that is really just because there hasn't been any change and until there is change you don't get a Harborwalk.

M: What did you hope for the Harborwalk in comparison to what it has become?

JF: I think the biggest hope has been achieved, which is that it is open to the public. And there is a lot of debate about beyond being just being open to the public, what a Harborwalk should have. But for me it is like 85% just being open to the public. There are additional things that you could have that would make it kind of a better public space, but I don't think they are as critical as just having it actually open, no gates, no fences 24 hours a day people can walk through there. And people will make use of it. Whether it's somebody in the neighborhood, or somebody walking their dog or people jogging or just going for a stroll or whatever, it's open to the public and it is great and they get to walk around and see what is going on on the waterfront. There are other kind amenities that could go along with the Harborwalk that would make it better in some areas, or nicer because you might have a restaurant next to it with some outdoor dining for example. There is spots where that happens. You know you might have benches or binoculars or things like that. But you know people are very happy just to have the opportunity to walk the waterfront and to have it connect to other places. So you can walk along the waterfront and not have to come back out and go through a section of the city, then get back to the waterfront and have to come back out again, so it is just a lot nicer if it is a continuous path separated from the rest of the city. And even though you are right in the city you are like wow, I am in a different world right here. So you know there are things like signing, and lighting, and benches, and trash barrels, and all that kind of stuff. But it is not as important as just having the walkway there.

M: Lastly, why do you believe the Harborwalk has been passed as a zoning law, rather then eminent domain or something else?

JF: Well as I said it is not actually the zoning that creates the public access. The zoning can create the space to have a public access walkway, but the zoning can't actually make it public. It is only through Chapter 91 that you are able to actually create public access. So there were discussions early about eminent domain, and taking you know a strip of land all along the waterfront and making it public. But you know you have the cost of the taking, which would be really substantial as well as the political controversy of trying to do the taking. Then you have the cost to actually construct the Harborwalk, and then you have to cost to maintain it. While there are some good examples I think in general, some cities and towns are not necessarily very

good at either construction or maintenance of places like that. And really Harborwalk's are high maintenance, anything you know that is right on the waters edge is always going to have a high cost of maintenance cause you are right next to the salt water. Whether you are on land or over the water, if you are over the water you having pilings that need to be replaced and maintained, and they are exposed in storms, and get banged by boats, and banged by logs floating around in the harbor. The timber planking wears our and splinters, and needs to be replaced. If you are on land you have seawalls that crumble and fade, need to be repaired and restored. So it is a very, very expensive place to build anything. So the collective decision I think is basically been to rely on private development for Harborwalk construction and maintenance. And it means that its taken longer to get it done than if you came in with a big public program maybe and just took over the waterfront and did it all. But I think there are some good things. Certainly you know it saved the public a lot of money, hundreds of millions of dollars in public expenditure. And it also has created a very, if you have walked the Harborwalk you know, every section is different. If you ever get to San Diego and you see their Harborwalk. It is like this enormous, gigantic continuous strip that is virtually identical for miles, and it is another way to go. But I kind of like Boston, I kind of like that unique quality to it where every property that you go across it changes materials or width or dimension or use or whatever, so it is a very interesting place to walk because it keeps changing on you.

Toni Pollak Interview Transcript

September 20, 2012

D is herein after referred to as Devin Mulcahy, and TP refers to Toni Pollak.

TP: Hello

D: Hi Tony Pollak?

TP: Speaking.

D: Hi my name is Devin Mulcahy I am with The Boston Harbor Association. We are students from WPI, and we are doing a project with The Boston Harbor Association analyzing and getting different perspectives on the Boston Harborwalk. We wanted to start off just by asking you, just to start off in general terms, what has your experience been, how much can you say about you're experience with the Boston Harborwalk and what it brings with the Boston waterfront.

TP: Well I've been involved with what is going on with Boston Harbor since I started my career at the Aquarium. And that was one of the first locations that built the Harborwalk. So I think it was at that time it was incredibly symbolic and really opened people's eyes to the harbor who had turned their backs on it during a period of time because it was so polluted. I think it allowed people to gain access to the different locations and the Harbor Islands, to connect a lot of the uses, it's became sort of a park like setting that people enjoy. It has been a tremendous positive element in the development of the city.

D: Could you elaborate more on some of the uses that you just mentioned?

TP: Well there are a number of cultural organizations that are either on the Harborwalk or around the Harborwalk it's a great link. The Childrens Museum the ICA the Aquarium the Charles Town Navy Yard sites the Constitution. And I think it is a tremendous resource to be able to get the public to the water, and also across the Harbor, in Ferry service which making that access available has really enhanced the visitor experience. Of course there are people also commuting now from one side of the harbor to another and without Harborwalk and access to the Harbor's ends that couldn't happen. It's all positive.

D: In terms of its development can you speak to how it is developed differently in different neighborhood? You say like parts of the north end such as the aquarium and the ICA that you mentioned. What about other areas such as Dorchester and East Boston where the development is kind of catching up where do you see the potential in that?

TP: Well I think that both Dorchester and East Boston, I think it will only improve the neighborhoods access to the waters edge as more of the Harborwalk gets built out and some of the missing pieces are connected. I think it could be a great bike path, a great pedestrian corner for visitation for exercise etc. I think they are generation of potential. I think the downtown neighborhoods and they vary much in building type and scale, again its' allowed those communities to really utilize the Harbor as an asset and not a negative which it was for many years. When the piers were falling in and there was no one living or working in that area so we have seen the revitalization of the waterfront. I think being at the waters edge on the Harborwalk has helped that.

D: Starting off since you have seen a lot of the waterfront development during your tenure, what would you say about what you expected the Harborwalk to be when it was first proposed and what it has become?

TP: What I thought it would be, and what it is in reality?

D: Yes.

TP: You have to remember that the Harbor when the Harborwalk began was filthy. We had a huge amount of infrastructure projects through water and sewer and the MWRA to change that. It was a little unclear at the beginning. It was great to get people down to see the views but would they use the water sheet and would they want to take the next step? I think what has happened is with the clean up of the Boston Harbor its made people realize as I said before it is a huge asset and you need this kind of access which Harborwalk provides to get to the water sheets, to get around the water sheet, to access a lot of organizations, a lot of these institutions have sprung up. And some of the amenities sprung up we now have cafes we now have the big discussion about more public art; there's discussion there are amenities ferry terminals there is a reason to be there that didn't exist when this first occurred. Nobody was really sure if that would follow suit, and it did again in dramatic ways. It was a gamble I think in the beginning, if we hadn't cleaned up the harbor I don't think it would be the success that it is.

D: Is there anything that you wish you saw more of in terms of amenities or public use?

TP: I would like to see more ferry service in the harbor, which is an expensive proposition but I think getting people out of their cars is a good thing. I would like to see more public art, and that can be all kinds of things. I would like to see more interpretation of some of the history. And the current uses in the harbor I would like to see more signage way finding signage. I think that the rest will come. I think that Chapter 91 requires that every public component on the first floors must help provide restrooms museums, and other amenities. I think that the tools are all there and the economy will just let itself out really and hopefully improve and some of these things will be realized.

D: I think that's it for questions on my end. Do you have any questions for me at all?

TP: What are you guys doing with this information?

D: This is all just going to go into a report that we are going to present to The Boston Harbor Association.

TP: What is the crux of the report? Just people's opinions of the Harborwalk or what the extents are?

D: It's a big report on the current state if the Boston Harborwalk and then getting policy makers opinions on it as well as property owners and developers.

TP: Great

D: Okay great thank you very much for your time.

Al Raine Interview Transcript

September 24, 2012

M is herein after referred to as Molly Mioduszewski, and AR refers to Al Raine.

M: Hi Al this is Molly.

AR: Hi Molly, how are you?

M: Good, How are you?

AR: Good

M: Okay to start off I will tell you just a little bit about our project. We are from WPI and we are working with The Boston Harbor Association, and we are trying to make a database about the Boston Harborwalk. We also want to get an idea of how the Harborwalk interacts with properties along it. But from you we mostly want to know more about the history, since obviously you know more about the Boston Harborwalk. To get into it our first question is what was your experience during development of the Boston Harborwalk?

AR: Well, I was the principal of the Chapter 91 regulations, more or less the interest to me were the 1990 regulations which were a very small of amount of clicking since then with the regulations that we have today. And the whole concept of the whole Harborwalk is obviously central to those regulations. So this will be a three part answer. The first part is from 1985 or so to the 1990s when the Dukakis? Administration was developing the Chapter 91 regulations and their principal concepts. I was the person guiding that process, and the idea of what we now call the Harborwalk was essential to that regulation. The second the thing I would say in that same period of time when the city of Boston was rezoning all of the various waterfront districts with the BRA. When the city of Boston and the BRA were doing what they call the Harbor Park, rezoning of the waterfront through the details of the Chapter 91 regulations. In addition to coordinating very closely with the city people who were doing that, I was actually a member of the mayors, I think there were fifteen members, Harbor Park advisory committee. I was the representative appointed by the mayor on that on both the state and the city. I had a role in getting to what now is the Harborwalk. I guess the first thing I would say is that in all of the time since then particularly in the not a long time I've been a trustee of The Boston Harbor

Association, I was virtually every industrial project that comes up will be in the chapter 91 and the parallel city process? Its getting the The Boston Harbor Association and all the forms that the The Boston Harbor Association made, and how you do on the harbor use committee all that time and taking at least some role in comments that's going to make discussion process that surround it.

M: Our second question is why do you think different neighborhoods are in different developmental stages of the Boston Harborwalk, why are some more developed than others.

AR: I think its really straightforward and it follows the path of development itself. The underlying premise of the Harborwalk is that wherever possible the private developers are going to fund the common section of the Harborwalk, if you're going to have a lot of development you are going to want a Harborwalk and vise versa.

M: What did you hope for the Harborwalk in comparison to what it has become.

AR: I kind of envisioned what it has become to be perfectly honest. When we were wrestling with this idea of what this zone between the building and the water should be, I guess the two big questions we had a wrestle with were, number one in an actual design and content sense what did we imagine this design might be and obviously in different places it would be different things, but there was that and the whole question if you are relying largely on the private developers to implement this thing will it be of the quality and the time frame that you want. Without being polyiterish? I think by and large its come out pretty consistent with my expectations and where I didn't have the clearest sense of what it might be the way it has turned out has kind of defined my expectations. When you go over to the cities other big waterfront cities, at least in this country you don't really see the kind of block after block, mile after mile Harborwalk or equivalent to what we have. There are cities like new york who have, where something like the Harborwalk is notoriously absent along most of the waterfront. And there are places like Seattle that we think of as places that we learn from, and go see, and everything else. I know Seattle very well cause my sister lives there and I go visit all the time, I think that when you look at downtown Charlestown Navy Yard, South Boston, Dorchester and the parts of East Boston that are done you know East Boston is the biggest hole but when you look at most of where the Harborwalk is and where is will eventually be and compare that to other cities I really think we are a hit.

M: Our last question for you is why do you believe that the Harborwalk has been passed as a zoning law as opposed to eminent domain or something else?

AR: Because the Boston waterfront is attractive enough with some sensitivity and exceptions and respect with the fact that is tough to do things in bad times, and easy to do them good times. With all that said the underlying premise that you can get from private developers to invest in fairly expensive waterfront amenities is something that you can't do everywhere but the Boston waterfront has emerged as a strong enough amenity for development that developers are not only willing to meet the Harborwalk requirements as a regulatory cost of doing business is probably how it was viewed originally more than not. But I think now the simple realization that if you are going to have a class a office building, or if you are going to have a tope end market residential building you need to have high end amenities. And if you are on the Harborwalk you high-end amenity is the Harborwalk. So I think the economic incentive for developers to participate appropriately is there. You need to regulate it through a combination of zoning at the municipal level, and the zoning like aspects of the Chapter 91 regulations and the municipal Harbor plan process. You need to regulate it both to make sure the developers actually will, and that the public has an appropriate say over what the product actually is. But we simply haven't needed, with weird exceptions to have the public step in and compel. I cant think of a single instance in respect to the Harborwalk where eminent domain, or a shred of eminent domain was used to get it developed. You've got a very strong enforcement crew anyway which is the chapter 91 regulations, if you cant get a chapter 91 license you cant build your project. It is not that zoning is a weak tool, it is a very strong tool and with the combination of zoning as a strong enforcement mechanism and with the underlying incentive to do it anyway have combined to create this hybrid semi voluntary semi regulatory process where the public has to do relatively little of the actual investing. There has never been in my memory had to take anyones land to get the Harborwalk done.

M: Lastly do you have any questions for us?

AR: What kind of product are you going to give us?

M: For The Boston Harbor Association we will be creating a database that will be compatible with a GIS map. We are collecting information along the Harborwalk of each parcel along the Harborwalk and its current condition and its status of completion.

AR: What is your time frame for the assignment?

M: We have three weeks left to work on it.

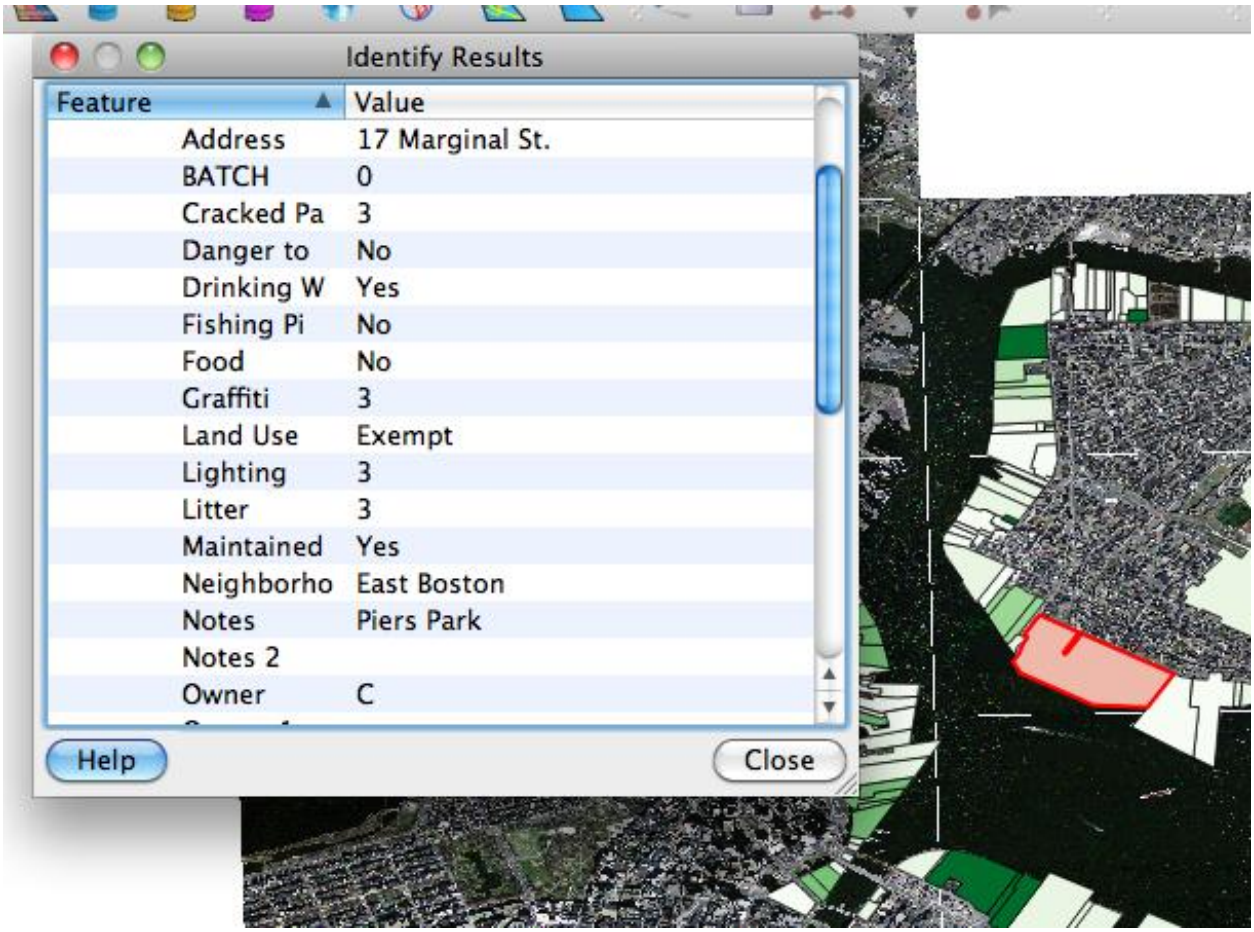
AR: Good this is something we really need.

M: Great well thank you so much. Bye

Appendix C: Geographic Information Systems Example Map

Below is a screenshot of most of the parcels along the Boston Harborwalk. It is not a complete version. Certain parcels can be highlighted to show a factor observed through our inventory.

Below is an example of our inventory information displayed for an individual parcel when it is selected.



Appendix D: Memorandum to The Boston Harbor Association

Memorandum

To: The Boston Harbor Association

From: Danielle Masone, Molly Mioduszewski, Devin Mulcahy, Kelin Song, Worcester Polytechnic Institute

Date: October 10, 2012

Subject: Policy Chapter 91 and Environmental Justice

Attached: Demographic Correlations Graphs and Land Use Tables

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Opening Segment

The purpose of this memo is to discuss the work our team has conducted in collaboration with The Boston Harbor Association to expedite the completion of the Boston Harborwalk. In this document we will discuss the history of the Boston Harbor, as well as the Boston Harborwalk's policy of implementation, Chapter 91. Our team will then go into detail describing the data collection process and research we conducted to investigate the issues impeding the completion of the Boston Harborwalk. Finally we will summarize with a discussion of our findings, conclusions, and recommendations. In the attached appendices, there will be demographic and land use information related to our project.

Context

Since the clean-up of the Boston Harbor in the 1970s, the city of Boston has continued their efforts to maintain and promote the Boston waterfront. The Boston Harbor Association was founded in 1973 in order to ensure public waterfront accessibility. They created the Boston Harborwalk to increase public interaction and foot traffic along the Boston waterfront. The Boston Harborwalk is intended to be forty-seven miles and currently is approximately eighty percent complete.

The primary legal component that allowed the implementation of the Boston Harborwalk is Chapter 91. Passed in 1866, its full name is Massachusetts General Law Chapter 91 and is also known as the Waterways Licensing Program. A clause in the zoning law requires waterfront

property owners to develop a Boston Harborwalk on their land when there is development. The policy of environmental justice also must be considered when dealing with public access to the Boston waterfront.

Environmental justice ensures that residents of waterfront neighborhoods cannot be subjected to the unfair use or access of the Boston waterfront. Environmental justice works concurrently with Chapter 91. For the policy of Chapter 91 to be environmentally just, it would have to equitably distribute environmental benefits and allow access to natural resources such as Boston Harbor through the Boston Harborwalk.

Task Segment

Per request of The Boston Harbor Association, our team first travelled the entire length of the Boston Harborwalk and created an inventory in the form of an Excel spreadsheet that is compatible with a Geographic Information Systems map. This inventory is broken down by each parcel of land and includes data on:

- Location of each parcel and its property parcel identification number found at the Boston Redevelopment Authority website
- Land use (commercial, industrial, public, residential) also found at the Boston Redevelopment Authority website
- Surrounding amenities including lighting, seating, public restrooms, public art, drinking fountains, fishing piers, food service, playgrounds, and trash barrels
- Current state of maintenance of the Boston Harborwalk for the entire route evaluated by the type of walkway, evidence of maintenance, degree of litter, degree of graffiti, perceived danger to pedestrians, and degree of cracked pavement

From all of the data, we calculated the average ranks and percent complete for all of the five waterfront neighborhoods. These neighborhoods include East Boston, Charlestown, Downtown, South Boston, and Dorchester. For this data the waterfront neighborhood Fort Point Channel is included in the data for South Boston.

With this inventory, we compared the data for each waterfront neighborhood with information researched from the U.S. Census Bureau. We investigated if there was a correlation between population density, median income, and ethnicity with the completion and state of maintenance of the Boston Harborwalk. In addition, we also compared the land use of all parcels on the entire Boston Harborwalk with its completion and state of maintenance. These studies

were conducted to examine if any of these factors impede the completion or affect the state of maintenance of the Boston Harborwalk. Also, analyzing these factors will also help us understand if the implementation of Chapter 91is environmental just.

Discussion

Of the demographic factors we considered for analysis, we concluded that median income is the most prominent factor in the completion and state of maintenance of the Boston Harborwalk. Also, we found that population density of a waterfront neighborhood suggests a positive effect on the percent of completion of the Boston Harborwalk. Lastly, we found that the ethnicity of a neighborhood suggests an influence on the state of maintenance of the Boston Harborwalk. In terms of land use, we concluded that it does not necessarily determine the completion and state of maintenance of the Boston Harborwalk. We recommend further research on the demographic and developmental trends of the Boston Harborwalk. The purpose would be to investigate if residents of waterfront neighborhoods are being given fair access to open space and funding concerning the Boston Harborwalk.

We concluded that Chapter 91 is successful in certain aspects of its implementation. However, there is indication that the implementation of Chapter 91 could be environmentally unjust. This is most apparent between the neighborhoods of East Boston and Downtown. East Boston, the area with the least amount of development, has the lowest median income. Conversely, Downtown, the area with the most amount of development, has the highest median income. Also, the majority of the land in East Boston is publicly owned, indicating that there is an underinvestment in the development of these parcels when compared to other waterfront neighborhoods. If this is proven to be true, this would represent a violation of Massachusetts' policy of environmental justice. From these conclusions on the policy of Chapter 91and environmental justice, we recommend the following actions to be taken:

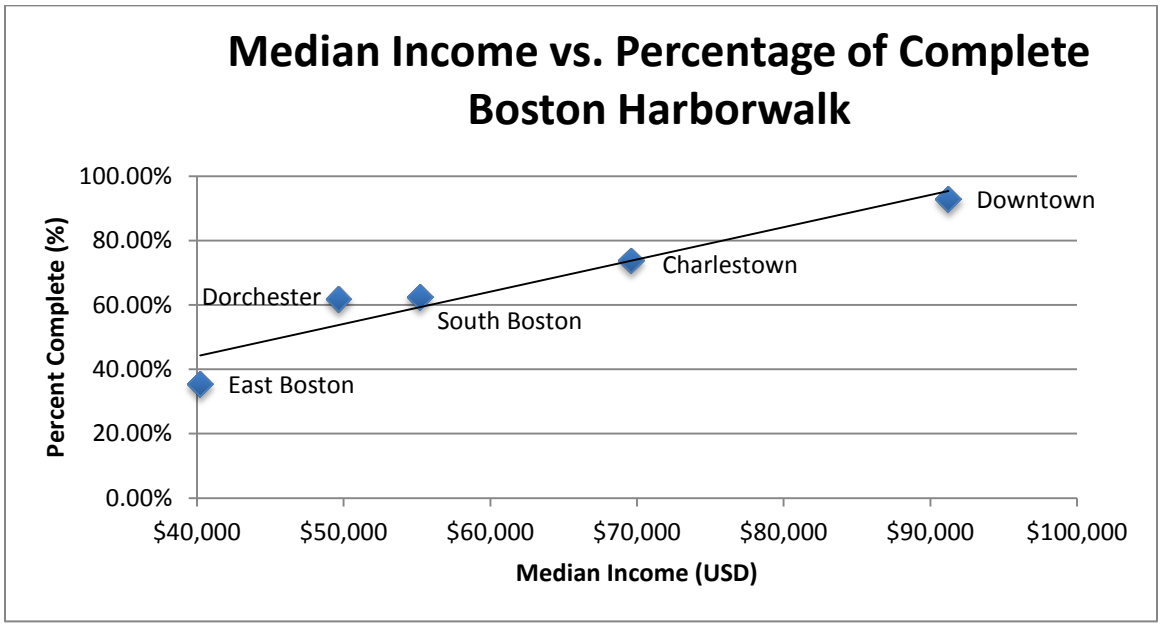
- Research Chapter 91's policy of implementation to see if it is environmentally just
- Allocate more public funding towards the completion of the Boston Harborwalk in low income waterfront neighborhoods

Summary

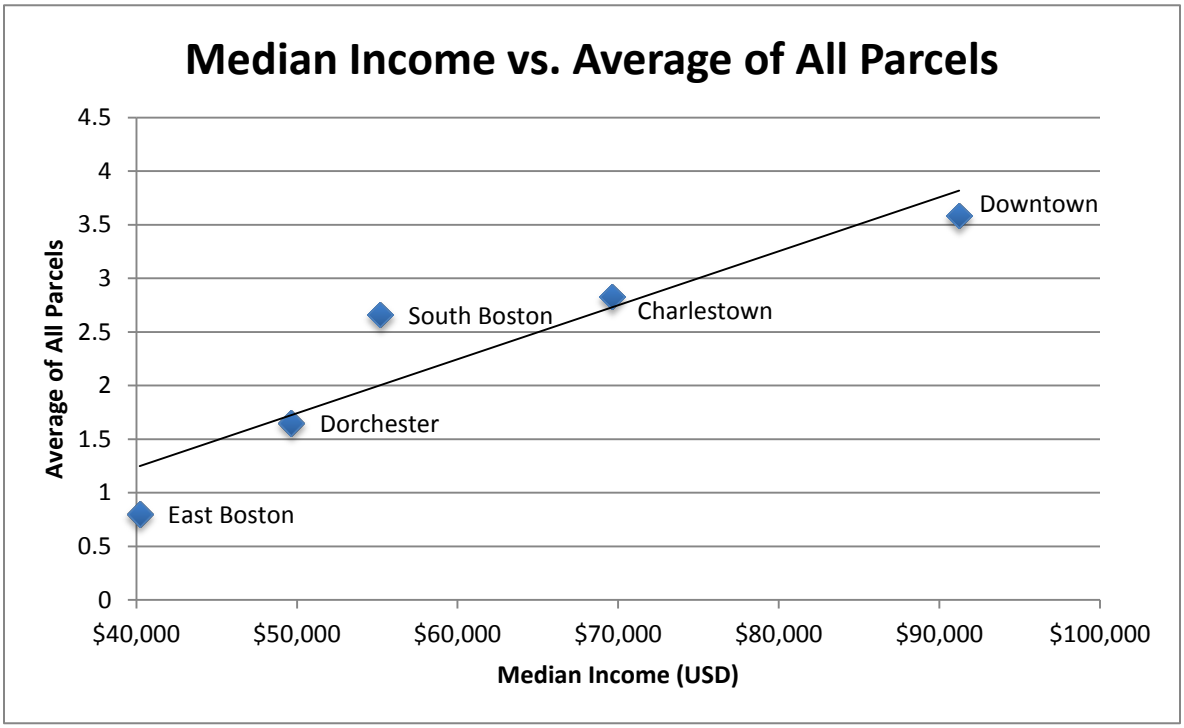
There are indications that the implementation of Chapter 91 is potentially environmental unjust because the median income of the waterfront neighborhoods of the Boston Harborwalk strongly correlates with the development and the state of maintenance. We suggest further

investigation to assess the possible existence of environmental injustice in Boston's waterfront neighborhoods.

Appendix for Memorandum



These data show that there is a very high positive correlation, with a coefficient of 0.953.



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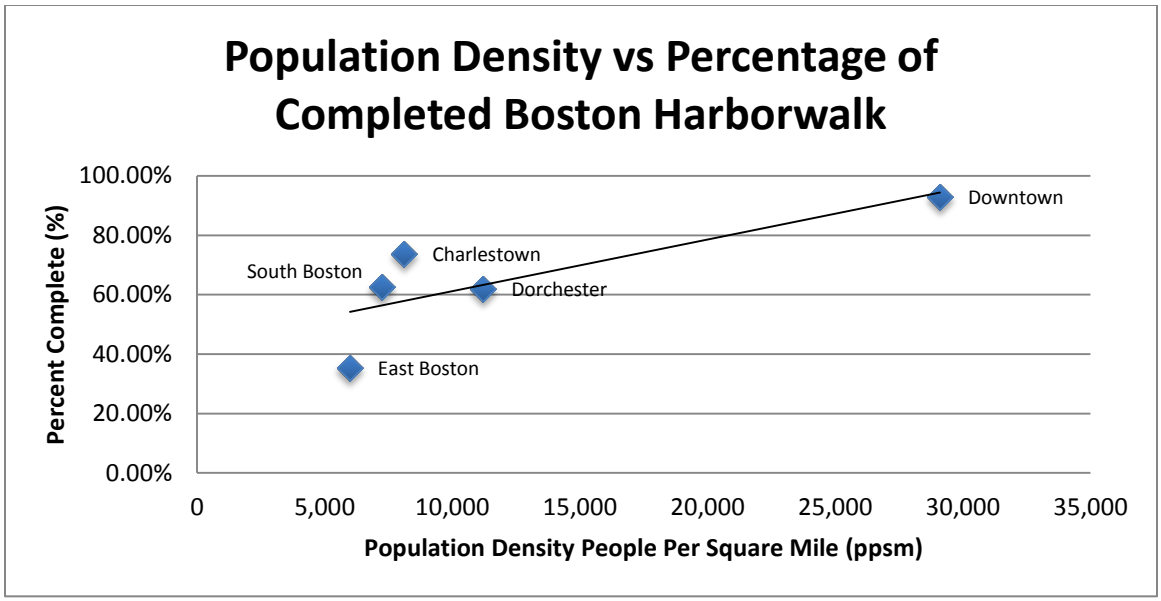

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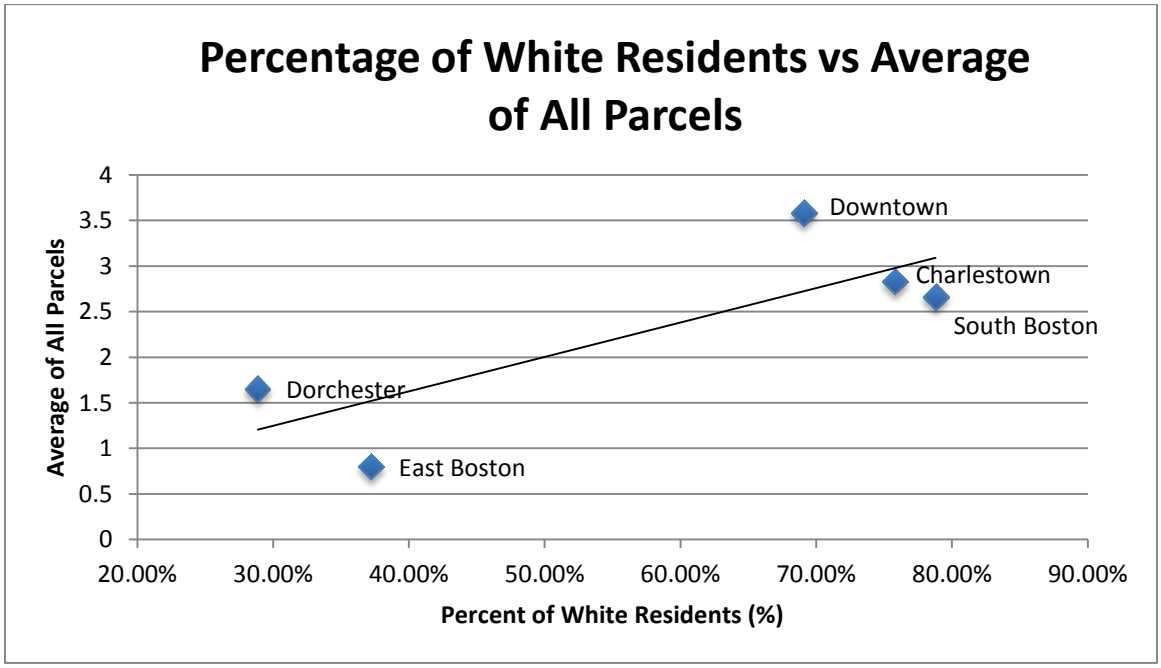

These data show that there is a high positive correlation, with a coefficient of 0.806.

East Boston Parcel Land Use

Land Use	Number of Parcels	Percent of Parcels	Complete Parcels	Incomplete	Percent Complete	Percent Incomplete
All	120	100.00%	23	97	19.17%	80.83%
Public	47	39.17%	15	32	31.91%	68.09%
Commercial	44	36.67%	5	39	11.36%	88.64%
Industrial	4	3.33%	0	4	0.00%	100.00%
Residential	25	20.83%	3	22	12.00%	88.00%

Downtown Parcel Land Use

Land Use	Number of Parcels	Percent of Parcels	Complete Parcels	Incomplete	Percent Complete	Percent Incomplete
All	37	100.00%	35	2	94.59%	5.41%
Public	16	43.24%	14	2	87.50%	12.50%
Commercial	11	29.73%	11	0	100.00%	0.00%
Industrial	0	0.00%	0	0	0.00%	100.00%
Residential	10	27.03%	10	0	100.00%	0.00%