



# **Inventory and Analysis of the South Boston Parking Freeze**

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## **Abstract**

The goal of this project was to evaluate the existing status of the South Boston parking freeze and to recommend changes in policy and procedure that will enhance the ability of the Boston Air Pollution Control Commission (BAPCC) to manage the parking freeze and improve its effectiveness in limiting air pollution from automobiles. The team provided an updated inventory of the parking freeze, an analysis of the effectiveness of the off-peak parking policy, and an information flow plan for the permit application process.

## **Acknowledgements**

The team would like to thank all those who have helped us throughout the past seven weeks in completing this project. Special thanks to our sponsor Mr. Carl Spector of the Boston Air Pollution Control Commission for providing the team with his insight and guidance. The team would also like to thank Mr. Bryan Glascock, director of the Boston Environment Department for giving the team the opportunity to work on this project. Thanks to Ms. Carolyn Bennett of the Boston Redevelopment Authority for providing the team with her GIS expertise as well as the GIS map layers needed to complete the project. The team also thanks Professor Fabio Carrera for his assistance particularly with MapInfo. Finally, the team would like to thank Professors Kevin Clements and Chrysanthe Demetry for their continued guidance and support throughout this project.

## Executive Summary

In 1963, an increased awareness of air pollution led Congress to enact the Clean Air Act (CAA). The CAA requires each state to develop a State Implementation Plan (SIP) detailing how each state will address its specific air pollution problems. Included in the plan are state regulations aimed at reducing air pollution in particularly polluted areas (U.S. Environmental Protection Agency “State Implementation”, 2006). As part of the Massachusetts SIP, the Boston Air Pollution Control Commission (BAPCC), a division of the Boston Environment Department (BED), was created to regulate a number of parking freezes in various geographic areas of the city. The BAPCC oversees three parking freezes in Boston, including Downtown, East Boston, and South Boston. A parking freeze limits the number of off-street parking spaces that can exist within a certain area of the city. Its goal is to reduce the number of vehicle miles traveled in the city by limiting the availability of parking. The program discourages personal transportation and encourages means of public transportation such as the Massachusetts Bay Transportation Authority (MBTA) system.

The South Boston parking freeze (SBPF) was established in 1993 to settle a pending lawsuit brought on by environmentalists over the impact of the Central Artery/Tunnel project. The South Boston parking freeze zone is divided up into three geographic areas: the Pier Zone, the Industrial/Commercial Zone, and the Residential Zone. However, residential spaces are mostly exempt from the freeze. In addition to capping the number of parking spaces at 30,147, the parking freeze also includes an off-peak parking policy that requires parking facilities in the Piers Zone to reserve 20% of their spaces from 7:30 to 9:30 a.m. to discourage commuters from driving into South Boston, delay their commute until after rush hour, and save spaces for short-term visitors such as shoppers (Boston Transportation Department, 2001).

The goal of this project was to evaluate the existing status of the South Boston parking freeze and to recommend changes in policy and procedure that will enhance the ability of the BAPCC to manage the parking freeze and improve its effectiveness in limiting air pollution from mobile sources. The four major objectives of this project were to:

- ❖ Organize existing permit information and determine what additional information should be included in the BAPCC database
- ❖ Update the existing inventory of parking spaces in South Boston by conducting a field survey of all parking garages and open-air lots

- ❖ Monitor and analyze the off-peak parking policy in the Piers Zone
- ❖ Create a plan for the electronic submission of new parking freeze permit applications

## **Parking Space Inventory**

The team conducted a field inventory of all parking spaces in the Industrial/Commercial and Piers Zones of South Boston. A key finding from the field inventory was that in most facilities, the number of permitted spaces exceeded the total spaces counted by more than the allotted 2% margin of difference. If the number of permitted spaces is not within the margin of difference compared to the actual number of spaces in the facilities, then the BAPCC will need to investigate further. The accumulated difference percentage for the facilities' actual space totals compared to the permit totals was 13%. This is significantly larger than the acceptable margin for difference set prior to the inventory. This difference accounts for spaces not actually being used either due to abandonment, not being marked or able to physically fit in the facility.

Other findings from the field inventory included:

- ❖ Many lots are not clearly marked and cars were parking in no parking areas.
- ❖ There are mostly public parking lots with price structures in the Piers Zone.
- ❖ The Piers Zone included the largest public parking lots in S. Boston, and are the most widely used by commuters.
- ❖ Facilities in the Piers Zone are well-kept and serviced in comparison to those in the Industrial/Commercial Zone.
- ❖ Several of the facilities allocate spaces for Zipcars in their lots. The team found that the Zipcars are the only form of ride-sharing program utilized by facilities in South Boston.

## **Off-Peak Parking Policy**

The first goal of the off-peak parking policy is to encourage the use of public transportation. The survey, in which thirty-six out of ninety-five drivers participated, found that 97% of drivers were aware of the MBTA Silver Line and 64% had used it before. These findings show that most drivers do use public transportation in South Boston. The Silver Line only services South Boston and Logan Airport, however it connects to the rest of the subway system. This gives South Boston indirect access to the entire subway system as well as the commuter rail. This survey only shows that drivers have utilized public transportation within the city and may or may not have used it from surrounding cities. Because the survey was conducted only in one South Boston parking facility on one day, the results can only suggest common trends and can not be used to make generalized conclusions about all drivers in South Boston.

The off-peak parking policy also aims to delay commuters from driving until after the morning rush hour. In surveying drivers, the team found that most (81%) drivers knew about the off-peak parking policy and 25% planned their commute around it. This finding seems to show that the policy has been effective in getting some commuters to go to work later in the day.

The team found that there is an overall lack of compliance with the BAPCC's off-peak parking policy in the Piers Zone. Twenty different land parcels with parking facilities were observed, with only 15% (3 parcels) blocking off any parking spaces. In addition to an overall lack of compliance with the policy, facilities that do set aside spaces do not fully comply. All three lots with set aside spaces made those spaces available before 9:30 a.m. The percentage of spaces set aside was also below the 20% requirement in all three lots. One owner set aside 16% of the total spaces and another only 10%. The third facility, located on the line between the Piers Zone and the Industrial/ Commercial Zone, blocked off only 12% of their spaces. These facilities were only observed on a single occasion and therefore these results may or may not be indicative of the facility's normal practices.

While investigating the effectiveness of the off-peak parking policy, the team found an undesirable side effect of the policy. The team found that there was much higher demand for parking in some facilities than in others, leading drivers to line up idling their engines waiting for a parking spot. The team found that at 9:15 a.m., cars began to drive around and line up with their engines idling inside of a Congress Street parking lot, because the rest of the lot was full. Meanwhile, a parking lot on Northern Avenue, one street over, had 155 empty spaces at 9:30 a.m. Price and location are likely the cause for the variable demand for parking as most drivers (58%) surveyed said that location was the most important factor in choosing a parking facility. Twenty-two percent of drivers said that price was their main reason for choosing a lot. Price is less of a factor in the South Boston Piers Zone because many facilities have the same price structure.

## **Project Deliverables**

This project generated a number deliverables for the BAPCC. The first was an updated database for the permit information. The team reviewed the current permit information and then reorganized it. Then, the team corresponded with the Mr. Carl Spector of the BAPCC as well as the Head of Planning for the Boston Transportation Department (BTD) to discuss what additional fields would be beneficial to add to the BAPCC database. The team decided to add

the following fields to the BAPCC database: an alphanumeric code to store multiple pieces of information in a single field, the parking freeze zone, pricing information, booth location, any ridesharing programs, curbside parking, and general comments.

As a result of the field survey, the team was able to produce an updated Geographic Information System (GIS) map using MapInfo to show the locations of all parking facilities in South Boston. The GIS map serves to give the BAPCC a visual location of all the parking facilities. Different GIS layers were created to show the parking facilities according to owner, number of parking spaces, and also pricing.

The team also created a plan for the electronic submission of parking freeze permits (PFP). This plan includes three major components: a new PFP application form, a flow chart outlining the BAPCC application process, and a written document explaining each step of the process. The application form is based on the current PFP application, but has been modified to gather additional information. The new application form was created using a Microsoft program called InfoPath, which is compatible with many different programs. With this plan, automating the permit process will be a simpler task.

## Recommendations

At the end of the project, the team was able to draw conclusions from the data collected and make the following recommendations to the Boston Air Pollution Control Commission:

- ❖ **Utilize MS Access as the format for the BAPCC database.** The BAPCC currently uses MS Excel to manage its parking freeze permit database. MS Access databases are capable of being directly linked to a GIS mapping program and MS InfoPath, which allows all the data in the submission form to be automatically put into the database. This increased level of efficiency would be greatly beneficial to the success of the freeze by allowing the BAPCC to track, update, and analyze the information quickly and with accuracy.
- ❖ **Expand the permit database to include additional fields.** The team recommends that the BAPCC expand the amount of information kept in the permit database to include additional fields such as zone, booth, lighting, Zipcars, curbside parking, and fencing. These fields will allow BAPCC to have a better overview of the condition of the parking facilities in a given area. The fields will only be added to the database, and updated during each inventory. The fields are not to be added to the permit in order to maintain the simplicity of the permit.
- ❖ **Reduce total number of permitted spaces for individual facilities.** The team recommends that the BAPCC reduce the number of permitted spaces for facilities with

actual totals significantly less than the current permitted total. Reducing the total of permitted spaces would eliminate some inefficiency that exists in the utilization of permitted spaces by a number of facilities. The unused spaces can be put back into the freeze bank, and could take the place of the 10% increase that is scheduled.

- ❖ **Conduct an annual compliance check of the off-peak parking policy.** The team recommends that the BAPCC conduct at least an annual compliance check of the off-peak policy. Performing a compliance check on a regular, or even unspecified basis would convey to the facilities the importance and value this policy has for parking in the city. In addition to an annual verification of compliance, the team recommends that the BAPCC institute a reward for those facilities found to be compliant on a yearly basis. A reduced renewal fee is one example of a possible reward.
- ❖ **Exempt owners with fewer than 100 parking spaces from the off-peak parking policy.** The team has concluded that it would be beneficial for the BAPCC to exempt smaller facilities in order to focus on more strictly enforcing the policy in larger parking facilities. This recommendation would result in 30 out of 43 owners being exempt from the policy, equivalent to a 70% decrease in the total number of owners affected by the policy. However, this change would only affect 687 spaces out of 17,214; a 4% decrease in the total number of spaces. Reducing the number of facilities affected by the policy will allow the BAPCC to work more closely with the larger facilities to try to increase compliance.
- ❖ **Create detailed guide outlining off-peak parking policy.** A guide should be produced giving the reasoning behind the freeze and how it is intended to work. Distributing this guide to parking facilities could improve awareness of the policy by educating parking staff at the various facilities. The team is also recommending that standard signage be produced and distributed to all the parking facilities required to set aside spaces. These signs would improve awareness with the policy as well as improve compliance by making it easier for facilities to enforce the policy.
- ❖ **Use information flow plan as foundation for automated permit process.** The team developed a conceptual plan for the electronic submission of new parking freeze permits. The information flow plan can provide the department with an excellent starting point for the requirements of the system as well as the electronic permit form for the system.

These recommendations aim to help the BAPCC better manage the South Boston parking freeze and therefore help reduce air pollution in the city of Boston.



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# 1 Introduction

Automobiles and other mobile sources are one of the largest contributors to air pollution. The regulation of mobile source pollution is required of individual states as stated in their State Implementation Plan (SIP). Part of the Clean Air Act (CAA) of 1963, a SIP includes rules and regulations each state will use to clean up polluted areas in order to comply with the pollution policy regulations set forth by the Environmental Protection Agency (EPA). According to the Federal Highway Administration, the number of registered vehicles in the United States has risen 170% in the last forty years, which means there is a substantial amount of pressure upon state officials to control pollution from mobile sources in their major cities (Woodyard, 2006). With pollution from mobile sources becoming an increasing problem, more emphasis is placed upon the transportation control measures implemented by each state. The states with some of the country's largest cities, including California, New York, and Massachusetts have placed the most emphasis on transportation controls. The regulation of mobile source pollution in these states is critical since there are such a large number of commuters.

With Boston being the one of the nation's most congested cities, the Massachusetts SIP focuses heavily upon the reduction of mobile source pollution in and around the city, specifically lowering the vehicle miles traveled (VMT). Since cars have become more affordable as the economy has grown, there exists a larger percentage of the population who drive into major cities. Massachusetts, along with many other states, has seen the effects of this increase. The growing number of travelers has a more concentrated effect on pollution levels in the Boston area, as the level of commuters is denser inside the city. According to the 2001 EPA Criteria Air Pollutants Report, mobile sources account for 98% of Carbon Monoxide Area Source Emissions in Suffolk County (U.S. Environmental Protection Agency "AirData", 2006). These mobile sources include highway vehicles such as cars and buses, and "off-road" vehicles such as construction vehicles. Fixed sources, such as factories and power plants, accounted for only 2% of emissions. Emissions from mobile sources have been increasing, as the same report from 1999 shows that mobile sources accounted for only 88% of emissions in Suffolk County (U.S. Environmental Protection Agency "AirData", 2006). These pollution levels are what the Massachusetts SIP aims at reducing. With the city's public transit approaching its maximum potential in terms of space, transportation controls aimed at lowering the VMT for commuters has become vital to reduce major air pollutant emissions in the city (Glascock, 2007). Suffolk

County accounts for the most VMT of all counties in Massachusetts, and reduction of the VMT is the main method used to accomplish the objectives of the Massachusetts SIP (Glascok, 2007).

The various parking freezes throughout Boston, controlled and operated by the Boston Air Pollution Control Commission (BAPCC), are one component of the Massachusetts SIP geared towards reducing the VMT. A parking freeze is a cap on the number of parking spaces in an area of the city. The idea is that limiting the supply of parking will cause the price of parking to rise and the availability of spaces to decrease. This decrease in availability also means a reduction in convenience for commuters, which will cause people to find alternative forms of transportation therefore reducing the VMT. The South Boston parking freeze (SBPF) was implemented in 1993. The BAPCC is responsible for keeping an accurate inventory of any motor vehicle parking spaces in the designated South Boston area, monitoring and tracking the use of restricted parking spots in the area, as well as implementing the permitting process and enforcing the parking freeze plan submitted by the BAPCC to the Massachusetts Commissioner of the Department of Environmental Protection (DEP) (Air Pollution Control Commission “Parking Freezes”, 2006).

The BAPCC is required by the Massachusetts SIP to report the updated inventory of parking spaces in South Boston every three years to the DEP. The last update to the inventory was done in 2003, and since then the BAPCC had done several maintenance related tasks for the freeze to try and keep the freeze running smoothly. A \$10 per space application/renewal fee was created to generate revenue and ensure that facility owners kept the BAPCC up to date with any changes. The BAPCC has increased the allowed number of spaces in South Boston by 10%, as described in the freeze’s original regulations, in order to accommodate additional development (Glascok, 2007). The SBPF also includes an off-peak parking policy aimed to keep commuters from driving during the morning rush hours. The policy requires facilities in the Piers Zone to reserve 20% of their total spaces from 7:30am to 9:30am to discourage commuters from parking during that time period. The analysis of this policy was integrated with the team’s inventory of the Piers Zone, since the team arrived in Boston when the next inventory update was already due to the DEP.

The BAPCC has yet to conduct any meaningful analysis on the information extracted from the parking freeze permits or on the specific parking freeze policies. The BAPCC was interested in finding out what aspects or characteristics of the facilities could be influencing the

parking freeze, and how commuters were reacting to the freeze policies. The BAPCC was also interested in moving toward an electronic permit application process. The BAPCC would like to electronically collect permit applications from those seeking new parking freeze permits in South Boston in the future.

The goal of this project was to evaluate the existing status of the South Boston parking freeze and to recommend changes in policy and procedure that will enhance the ability of the BAPCC to manage the parking freeze and improve its effectiveness in limiting air pollution from mobile sources. This goal was accomplished by updating the inventory of parking facilities in the area, observing compliance with the off-peak parking policy in the Piers zone, and developing an information flow plan to guide the creation of an electronic application process for parking freeze permits. With the completion of these tasks, we intended to provide the BAPCC with current data and observations which can be used to identify any parking trends or problems, which may lead to important revisions of existing regulations or the creation of new policies. An electronic submission process would enable the BAPCC to more efficiently track permit information in order to keep the status of the freeze up to date and accurate. The form will electronically gather the information required for a permit. Work done during this project was aimed to provide our sponsor with more information on the parking facilities based upon additional data fields which were added to the permit records kept by the BAPCC. With the ability to track more detailed information about the parking facilities, the BAPCC is able to construct more specific control measures to help regulate problematic elements of parking in South Boston.



## **2 Background**

This chapter serves to set the background for our project sponsored by the Boston Air Pollution Control Commission (BAPCC). An overview of air pollution regulations from the federal to local level is given to set the stage for the requirements of the South Boston parking freeze. The Clean Air Act (CAA) of 1963 was the first major legislation regarding air pollution control. As a result of the CAA, each state was required to submit to the Environmental Protection Agency (EPA) a State Implementation Plan (SIP) detailing pollution control strategies. Since a major part of a SIP addresses mobile source pollution, we present background information on transportation in Boston. In doing so, information on Boston's public transportation system is discussed as well as recent traffic trends in the Boston metropolitan area. Finally, details are given on the parking freezes in Boston. This information serves as a starting point for the project work aimed to help the BAPCC monitor and analyze the South Boston parking freeze.

### **2.1 Air Pollution Regulations: Federal, State, Local Functions**

There are many types of pollution that endanger the environment, but one of the more severe cases is from air pollution. In 1963, an increased awareness of air pollution led Congress to enact the CAA. As concerns grew over air quality, the government learned more and more about air pollution. This led to a number of amendments to the CAA during the next few years. The first amendment, called the Motor Vehicle Air Pollution Control Act, came in 1965. This act set the first emissions standards for light duty vehicles. The National Air Pollution Control Administration (NAPCA) was also established as a result of this amendment to help oversee the country's efforts at reducing air pollution. In 1970, new amendments were added to the CAA in order to broaden its reach. It was at this time that the EPA took over responsibility for air pollution control from the Health, Education and Welfare Department. The National Ambient Air Quality Standards (NAAQS) were also defined in the new amendments (Godish, 1997). In 1997, the EPA revised its air quality standards for ground level ozone (smog) and particulate matter (U.S. Environmental Protection Agency "Features of", 2006).

As a federal law, the CAA affects the entire country yet the majority of the law is carried out by state governments. The EPA sets the acceptable levels of pollutants that can be found in the air and it is then left up to the state to enforce the federal regulations. The reasoning for this

is that these problems often require a special understanding of factors such as local economy and geography. Specifically, the CAA requires each state to develop a SIP detailing how the state will comply. The State Implementation Plans outline how each state will address its specific air pollution problems. The SIPs have three major components: control measures, "non-regulatory" components, and any additional requirements necessary to satisfy the EPA's regulations. Control measures can be described as either rules and regulations or source-specific requirements, whereas examples of "non-regulatory" components would be "attainment plans, rate of progress plans, emission inventories, transportation control measures, statutes demonstrating legal authority, monitoring networks" (U.S. Environmental Protection Agency *"State Implementation Plans"*, 2007).

Included in the plan are state regulations aimed at reducing air pollution in particularly polluted areas. This plan must be approved by the EPA or the state risks losing its right to enforce the Act (U.S. Environmental Protection Agency *"State Implementation Plans"*, 2006). Once a SIP is approved by the EPA, it is incorporated into state and federal law. As long as the state continues to comply with the regulations in place, that state remains in good standing. If a state does not comply, more stringent regulations are established through a Federal Implementation Plan (FIP).

To comply with the SIP set forth by the state of Massachusetts, the city of Boston established the Air Pollution Control Commission (BAPCC). The commission's main goal is to improve the quality of air in Boston by acting in accordance with the Massachusetts SIP. While the BAPCC's objectives have changed over the years, they currently write and enforce regulations, grant permits, advise other city departments, hold public hearings, and cooperate with other local, state, and federal agencies in the pursuit of common goals. It is clear that one of these goals is to reduce the air pollution in the city of Boston, the majority of which is caused by mobile sources. When the BAPCC was established, they centered their effort on mobile source pollution by instating the Boston parking freezes.

Limiting the number of parking spaces will cause an increase in the price of parking and a decrease in the availability of spaces. This decrease in availability will result in a reduction in convenience for commuters, which will cause people to find alternative forms of transportation therefore reducing the total number of vehicle miles traveled (VMT) in Boston. The instatement

of the South Boston parking freeze is intended to improve Boston's environment, as well as fulfill the regulations set forth by the CAA and the Massachusetts SIP.

## **2.2 Transportation in Boston**

As the capital of Massachusetts, Boston is one of the most recognizable and important cities in New England. Since so many people work, shop, and sightsee in Boston each day, transportation problems are unavoidable. In order to meet the requirements of the Massachusetts SIP, local officials must lower VMT in the city and promote the use of public transportation.

Boston's urban transportation system consists of a complex system of roads and highways, as well as an extensive subway system. Even with this system in place, as well as an adequate bus system, the city is still facing a problem with traffic volume due to private automobiles coming in and out of the city on a daily basis. Over 540,000 cars were entering the city every weekday as of 2001, a result of an increase in jobs, tourism, and population (Couture, Barber, Armato, & Allard, 2001). It is clear that this number has only grown in the years since. Such an influx occurred even with increased levels of participation in public transportation during that time. In some locations, the public transportation system is being used to capacity (Glascok, 2007). Some of Massachusetts Bay Transportation Authority (MBTA) stations have reached capacity for commuters who live a fair distance from the nearest MBTA station. They try to drive to nearest MBTA station to take public transportation into Boston only to find that some of the MBTA station parking lots are full ("Not a lot," 2004).

One major problem was congestion associated with the Central Artery Expressway. When constructed in 1959, the Central Artery was designed to comfortably carry 70,000 vehicles a day. By the 1990s, over 200,000 vehicles were using the Central Artery each day causing huge traffic delays and numerous car accidents (Massachusetts Turnpike Authority, 2007). To alleviate this problem, planning began in the 1980s for the Central Artery/Tunnel Project, also known as the Big Dig. This remarkable project sought to replace the six lane elevated highway called the Central Artery that ran through the heart of downtown Boston with a new underground highway. The second major component of the Big Dig was to extend I-90, the Massachusetts Turnpike, through a tunnel below South Boston to Logan Airport. A map of the completed Big Dig is shown in Figure 1.

The goal of the Big Dig was to improve traffic conditions, air quality and the overall quality of life in Boston. By improving driving conditions and making it easier to drive into Boston, there was concern that more people might drive into the city. With easier travel routes, it leaves the possibility for faster transit times and shorter waiting periods for public transportation. With shorter rides on buses, streetcars, and shuttles, commuters are encouraged to travel into Boston via public transit.

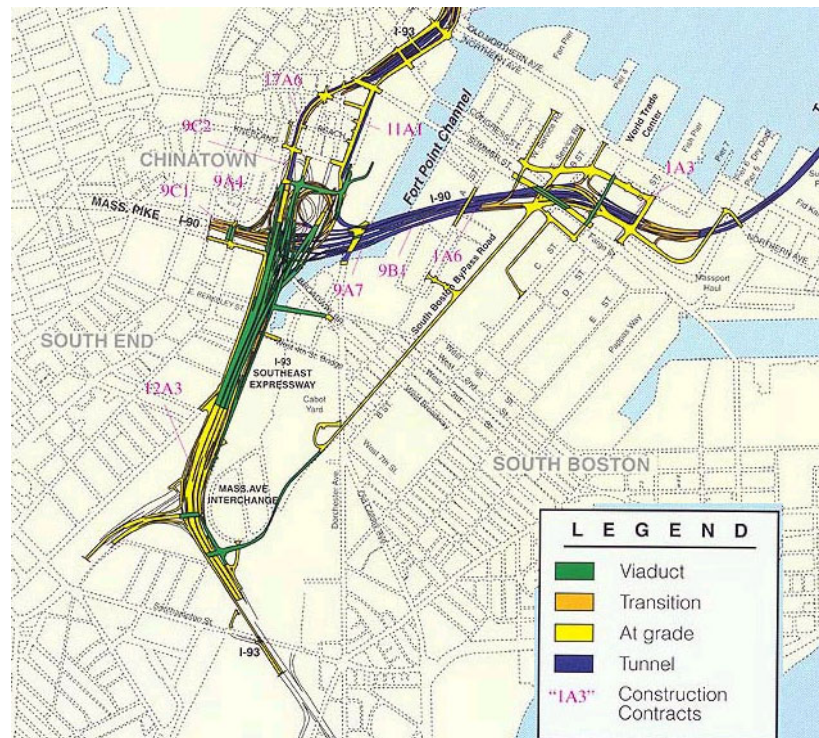


Figure 1. Section of Completed Big Dig Map  
(Massachusetts Turnpike Authority, 2007)

### 2.2.1 Massachusetts Bay Transportation Authority (MBTA)

In 1897, Boston became the first American city with a subway system. In 1918, the General Court passed the Public Control Act, which allowed for public controlled mass transportation at fares which would cover the costs of operations. Under the Public Control Act of 1947, the remaining outstanding stock of the Boston Elevated Railway was purchased by the Legislature and eventually renamed the Massachusetts Bay Transit Authority in 1964 (The Massachusetts Bay Transportation Authority, 2007). The MBTA offers an extensive subway system to the citizens of Boston, providing transportation for everyday use.

Figure 2 shows the current MBTA system which runs approximately 350 streetcars, 50 trackless trolleys, 1000 buses, 55 commuter rail trains, and 300 rapid transit vehicles. Such a diverse supply of transportation methods makes for a more efficient urban transportation system by providing different avenues for the population to get around the city. A survey conducted by the MBTA in 1989 showed that the main reason (58%) the everyday commuter chose the MBTA







per year in the Massachusetts. There are multiple reasons for the VMT to increase much faster than the population. One reason is that the number of drivers has increased rapidly. According to a Nationwide Personal Transportation Survey, the percentage of women age 16 or older who work grew from 37% to 59% between 1969 and 1995 (*Our built*, 2007). If people want to take those jobs, then they may need to drive to work daily. This attests to the increasing VMT for many cities around the country.

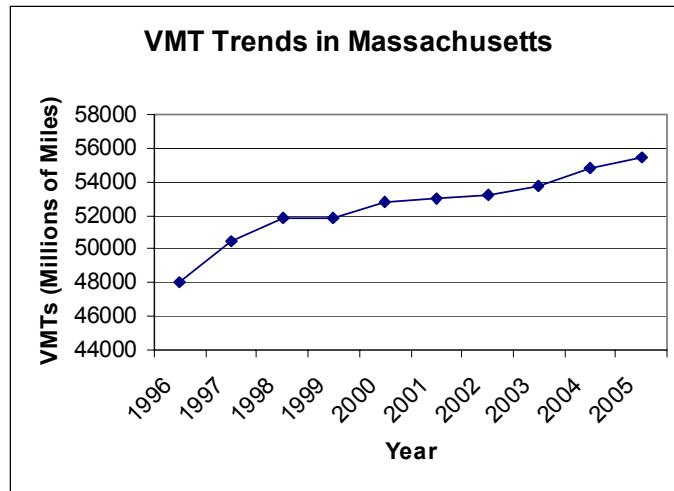


Figure 5. VMT Trends in Massachusetts (U.S. Department of Transportation, 2005)

Vehicle ownership has also increased significantly faster than the population. More people can now afford multiple vehicles. From 1950 to 2000, the population increased over 80%, whereas automobile ownership rose by 383% across the nation (The Boston Foundation, 2004). Figure 6 shows the dramatic increase in vehicle registrations in Massachusetts since 1997. With people owning more cars, the VMT increases because people who previously were unable to drive

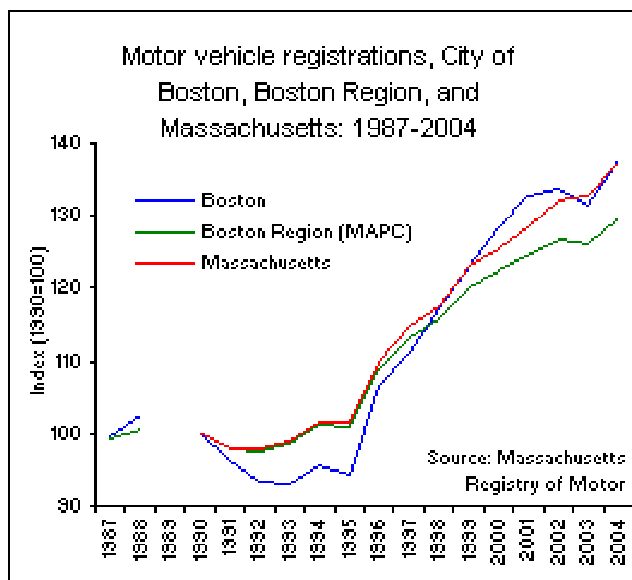


Figure 6. Vehicle Registration Data (The Boston Foundation, 2004)

are now able to. One reason may be that the economy has grown and cars are becoming more affordable. In Massachusetts, there exists more than one motor vehicle for every licensed driver, two vehicles for every household, and 1.5 vehicles for every job in the state. The state has an overabundance of cars, which contributes to the high VMT within the major cities and thus must

be regulated more efficiently via regulations and transportation measures (The Boston Foundation, 2004).

## 2.3 Challenges Implementing the SIP via Parking Freezes

This section gives the background information necessary to understand how the parking freezes are designed to work and how they fit into the Massachusetts SIP. First, a brief history of the parking freezes in Boston is given followed by a section describing the parking freeze permit application and renewal process. Lastly, the current state of South Boston parking freeze is discussed in order to set the stage for the project's work with the freeze.

### 2.3.1 History of Boston's Parking Freezes

As part of the Massachusetts SIP, the Boston Air Pollution Control Commission (BAPCC) was created to regulate a number of parking freezes in various geographic areas of the city. As of 1973, commercial parking in downtown Boston has been capped off as a means of reducing air pollution in order to comply with the Clean Air Act (CAA) (Boston Transportation Department, 2001). A parking freeze limits the number of off-street parking that can exist with a certain area of the city. Its goal is to reduce the number of vehicle miles traveled in the city by limiting parking. The program discourages personal transportation and encourages means of public transportation such as the MBTA system. Restricting the number of off-street parking also hopes to promote transit-related development.

Although the parking freezes in each section of the city came under different circumstances, each freeze arrived by the same general process. First, the Massachusetts

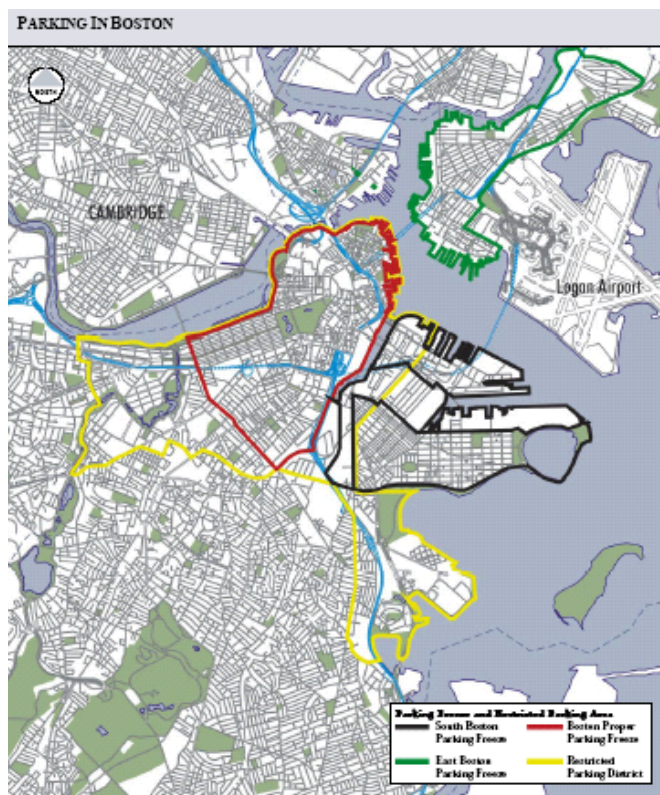


Figure 7. Restricted Parking Zones in Boston (Boston Transportation Department, 2001)



Department of Environmental Protection (DEP) sets the regulations regarding the number of spaces allotted and is able to approve changes to allow for future development. Next, the BAPCC took an inventory of parking facilities in the area and determined the process by which it would issue permits. Then the BAPCC issued initial parking freeze permits to the existing parking facilities. After the initial inventory and issuance of permits, any new parking facilities could apply for a new or modified parking freeze permit. The following sections describe the three parking freezes in Boston that the BAPCC oversees, including the areas of Downtown, East Boston, and South Boston as well as the parking freezes under the jurisdiction of the Massachusetts Port Authority (Massport). Figure 7 shows a map of the restricted parking areas in Boston.

### **Massport Parking Freeze**

Besides Logan International Airport, Massport owns and operates 585 acres of waterfront property, including 285 acres in South Boston. In 1993, Massport initiated what it calls the Strategic Plan for its properties in South Boston. The plan, among other things, aimed to improve the port while also limiting its impact on local traffic. To do so, Massport set a cap on the number of parking spaces available for Massport property (Massachusetts Port Authority, 2007). Massport properties within the South Boston freeze zone are not the responsibility of the BAPCC but rather the DEP. In 1994, parking on Massport property was capped at 6,064 spaces in the Piers Zone and 2,933 spaces in the Industrial/Commercial Zone. The provisions of the freeze allowed for a 10% increase in the number of spaces from the base inventory to allow for development (Boston Transportation Department, 2001). It is important that Massport and the BAPCC work together in restricting parking as each freeze has an affect on the other.

### **Downtown Parking Freeze**

The first parking freeze in Boston was enacted in 1973 covering “Boston Proper”. This area included Downtown, the Back Bay and the South End. Parking in downtown was limited to 35,500 public parking spaces, the number of spaces found in the area in 1975 (Boston Transportation Department, 2001). This included all commercial spaces intended for the general public. Residential parking does not fall under the provisions of the freeze. Private off-street parking could also be exempt from the parking freeze if granted permission from the BAPCC. Parking qualifies as private off-street parking if the spaces were reserved solely for the

employees, patrons, and guests of that particular building; the general public would not have access. Private parking requires users to show some sort of identification in order to access the facility. As of 2005, there were approximately 350 parking facilities in the downtown area and around 200 parking spaces left in the parking freeze bank (Boston Air Pollution Control Commission “Parking Freezes”, 2007). The terminology ‘freeze bank’ refers to the number of spaces still available to be given permits for. For instance, if a facility is granted a permit for 500 additional spaces, then 500 spaces come out of the freeze bank. If there are no spaces left in the bank, then no additional permits can be given out and no additional spaces can be created.

### **East Boston Parking Freeze**

In 1991, the Department of Environmental Protection (DEP) approved a parking freeze in East Boston. Two years later, the plan was approved by the EPA. This freeze affects the residential areas surrounding Logan International Airport in East Boston. Under the provisions of the freeze, rental car and park-and-ride spaces are capped at 4,012 and 2,475 spaces respectively. Logan airport falls under the jurisdiction of a separate parking freeze imposed by the Massachusetts DEP and Massport. The number of spaces at Logan is capped at 19,315 (Boston Transportation Department, 2001). Currently, there are four rental car lots with a total of 2,906 spaces and four park-and-ride facilities totaling 1,156 spaces. The East Boston parking freeze bank currently has no spaces available (Boston Air Pollution Control Commission “Parking Freezes”, 2007).

### **South Boston Parking Freeze (SBPF)**

The BAPCC also oversees the parking freeze in South Boston. The SBPF was established in 1993 to settle a pending lawsuit brought on by environmentalists over the impact of the Central Artery/ Tunnel project. By capping the number of parking spaces in South Boston at the level they were at in 1993, the freeze intends to maintain traffic at that level. The limit on the number of spaces was set 10% higher than the base inventory to allow for development (Boston Transportation Department, 2001). This ensures that the roads do not become congested with new drivers and cause the same old problems. Both the Big Dig and the South Boston parking freeze had the common goal of decreasing traffic congestion and the air pollution that results from cars idling in traffic. The Big Dig was intended to reduce air pollution by improving traffic flow and congestion thereby reducing idling vehicles and the resulting pollution. It is

critical that both are able to complement each other in achieving these goals (Massachusetts Turnpike Authority, 2007).

Similar to downtown, residential spaces are exempt from the freeze, however employee and general public parking are not exempt. The South Boston parking freeze is also divided up into three geographic areas, the Pier Zone, the Industrial/Commercial Zone, and the Residential

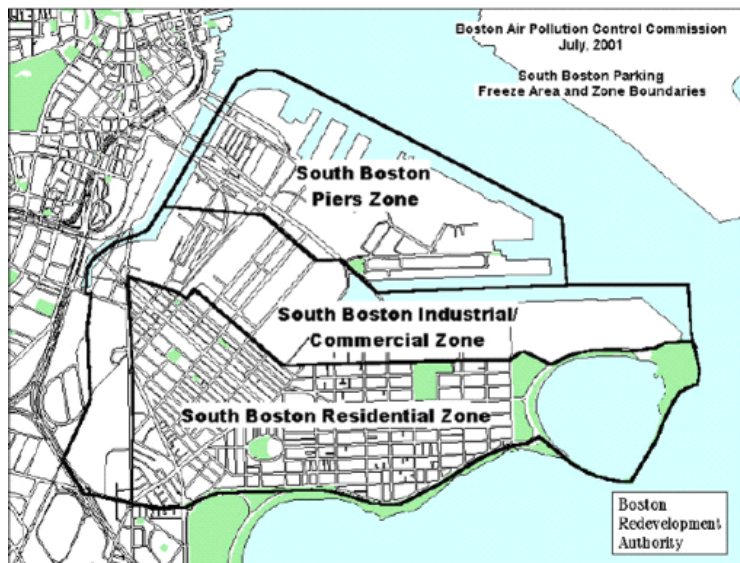


Figure 8. South Boston Freeze Area  
(Air Pollution Control Commission "Parking Freezes", 2007)

area south of First Street, as shown in Figure 8. In addition to capping the number of parking spaces at 30,147, further restrictions apply.

Between 1993 and 2004, parking facilities in the Piers Zone were required to reserve 10% of their spaces from 7:30 to 9:30 a.m. as a means to limit commuters from driving into South Boston, delay their commute until after

rush hour, and save spaces for short-term visitors such as shoppers. The reason for this is that daily commuters are the major cause of traffic congestion and air pollution. The morning and evening rush hour are the main concerns in regards to traffic congestion and air pollution. Short term visitors later in the day are less of a problem. With better public transportation in South Boston due to the opening of the MBTA's Silver Line in December 2004, the off-peak parking policy was increased to 20% (Boston Transportation Department, 2001). As with any policy change, the increased off-peak parking requirement faced opposition from drivers and lot owners. According to the BAPCC, drivers pulled up to their usual lots to find that spaces they had always parked in were closed off, causing cars to line up in the street waiting for the lot to open at 9:30 a.m. Cars idling in the street would actually increase air pollution. Other problems with the policy were associated with how and where the lots were to close off 20% of their spaces. The Boston Globe reported in October 2005 that three South Boston lot owners told

them that they were not blocking off any spaces between 7:30 and 9:30 a.m. and that no government official had come by to check on compliance. (Wall, 2005)

### **2.3.2 Permit Application & Renewal Process**

As a means of controlling the number of parking spaces in South Boston, parking facilities in the area must apply for a parking freeze permit (PFP) or exemption from the BAPCC. This allows the BAPCC to keep an inventory of the current number of spaces allotted and also to see how many spaces are left in the freeze bank. In addition, permit holders are required to renew their permit each year and pay a renewal fee of \$10 per space. This renewal fee not only generates income for the department, but also assists the BAPCC in keeping accurate records of the facilities. The fee discourages permit holders from not informing the BAPCC of a reduction in parking spaces due to construction. A reduction in parking spaces at one facility means that those spaces can now go into the freeze bank. Landowners must apply for the initial or renewal PFP if they have existing non-residential off-street parking within the Pier or Industrial/Commercial Zone or if they would like to change the layout, usage or price of these parking spaces. A new or modified PFP application must be filled out if new residential off-street parking is desired in the Pier or Industrial/Commercial Zone or if additional or modified non-residential off-street parking is desired in the Pier or Industrial/Commercial Zone.

The parking freeze does not apply to existing residential off-street parking within any of the three zones or new residential off-street parking within the Residential Zone. New commercial off-street parking within the Residential Zone that is intended to serve the Residential Zone is also exempt from the parking freeze. For example, a small convenience store located in the Residential Zone with a local customer base would not be required to obtain a permit. As for new residential off-street parking in the non-residential zones, an exemption will automatically be granted if the number of spaces per dwelling is less than or equal to one. If the number of spaces exceeds one, the applicant must file for a hearing with the BAPCC (Boston Air Pollution Control Commission “*Instructions for*”, 2006).

There are four types of parking permits: initial permits, renewal permits, modified permits, and new permits. Initial permits are to be issued to the owner of a given parking facility included in the parking freeze inventory. Renewal permits are simply initial permits that have expired and the holder of the permit would like to maintain their permit for the coming year.

Modified permits are initial or renewal permits that have been changed due to any form of parking area modification, e.g. volume, dimension. Finally new permits are issued to parking facilities where parking spaces must be taken from the parking freeze bank.

New and modified permits may be subject to additional conditions including “the number of parking spaces, conditions governing the use of the parking space, location of the parking facility, the location of the ingress and egress to said facility, landscaping, design and signage” (Boston Air Pollution Control Commission “Instructions for”, 2006). Applications for new and modified permits must be received sixty days prior to the next scheduled hearing, unless the BAPCC has allowed the application to be filed late.

The permit application process has several steps, outlined in Appendix J, that must be completed before a permit can be approved. Each permit application must fulfill the necessary requirements described in Appendix F and be submitted to the Boston Air Pollution Control Commission. The permit application is reviewed by the BAPCC, who will initiate discussion with the BTM to identify any issues with the permit application, a hearing will be held for the commission to vote on the approval of the permit. (Boston Air Pollution Control Commission “Procedures and Criteria”, 2006).

The BAPCC keeps an inventory of parking spaces in each parking facility located within the stated boundaries of South Boston, as shown in Appendix B. This information is kept in a database in order to keep an accurate record of all the facilities under direct jurisdiction of the parking freeze. Table 1 shows a portion of the database obtained from our sponsor. Note that only a few of the fields are shown.

APCC_ID	OWNER	Type	COMM	Remote	EmpTnt	Inventory	New
02.00	TWO 74 SUMMER STREET NOMINEE	Surface	0		2	2	0
03.00	TWO-85 SUMMER ST L P	S/G	0		14	14	0
04.00	THREE-TWENTY-SIX A STREET CONDO TRUST	Surface	0		0	0	0
05.00	BANFIELD DEVELOPMENT CORP	Surface	0		79	79	0
06.00a	JOEL B. BARD	Surface	0		0	0	0
06.00b	JOEL B. BARD	Surface	0		100	100	0
07.00	BARKAN/FARNSWORTH LPS	Surface	0		40	40	0

Table 1 S. Boston Parking Freeze Database

The fields shown are:

OWNER – the owner of the facility

TYPE – facility classification

REMOTE – the amount of remote parking spaces in the facility

EMPTNT – the amount of spaces used for employees or tenants

NEW – the recently added spaces.

Other fields include the permit ID number, BAPCC name, BAPCC ID, mailing address field, lot size, new/modified permit date, initial permit date, as well as additional fields that were added prior to the team's inventory.

### ***2.3.3 Current State of the South Boston Freeze***

It is easy to see that the parking freeze not only affects the number of parking spaces in that given section of the city, but also air pollution, the entire transportation system, and development in the area. One problem with limiting the number of parking spaces is that it could potentially make it very difficult to access a given area. This in turn could negatively affect development in the area because no one wants to build there if residents, workers, or customers will have no way of getting there. Because of this, there was great opposition to the South Boston parking freeze from developers when the plan was being developed. In order to accommodate development, the cap on parking spaces has been increased by 10%. After its implementation however, there has been very little opposition from developers. This is likely due to the fact that there are still spaces available in the freeze bank. As of 2005, South Boston had around 70 parking facilities and approximately 2000 spaces left in the freeze bank. (Air Pollution Control Commission "Parking Freezes", 2007)

Every three years the BAPCC must conduct an inventory of parking facilities in South Boston under the freeze in order to comply with Massachusetts SIP. This is done by going out into the city and verifying the permit information that they have as well as collecting additional information such as pricing. One reason to collect information on pricing is that it is not uncommon for the BAPCC to require a facility to charge market value for parking so that employers do not subsidize parking for their own employees. Such action would encourage driving, opposite the goal of the parking freeze. The purpose of the inventory is to check the accuracy of the BAPCC records and to ensure compliance with the parking freeze. The BAPCC

is required to send an annual report to the DEP containing a simplified parking freeze inventory database. Only the data fields important for the DEP are included in the report such as BAPCC ID, parcel ID, address, owner, and number of spaces.

This section has given the necessary background information on why the parking freezes were implemented in Boston and also how they are intended to work. With this knowledge and information on the current state of the freeze, our project was intended to provide the BAPCC with information to better manage the freeze. As South Boston continues to develop at an increasing rate, it will become even more important for the BAPCC to be able to manage the ever changing information on the status of the parking freeze.

### 3 Methodology

The goal of this project is to evaluate the existing status of the South Boston parking freeze and to recommend changes in policy and procedure that will enhance the ability of the BAPCC to manage the parking freeze and improve its effectiveness in limiting air pollution from mobile sources. The four major objectives of this project were to:

- ❖ Organize existing permit information, and determine what additional information should be included in the BAPCC database
- ❖ Update the existing inventory of parking spaces in South Boston by conducting a field inventory of all parking garages and open-air lots
- ❖ Monitor and analyze the off-peak parking policy in the Piers Zone
- ❖ Create an information flow plan for electronic submission of necessary permit information

The next sections will discuss in detail the methods by which we have fulfilled these project objectives.

#### ***3.1 Develop New Permit Information***

Before executing the field inventory, the team met with the Head of Planning of the Boston Transportation Department in addition to Mr. Glascock and Mr. Spector of the Environment Department to discuss which fields could be added to the PFP in order to benefit both departments. In brainstorming what additional fields would be useful, the team formed the following list of priorities. The additional information would enable the BAPCC to:

- ❖ More effectively evaluate compliance with the conditions of the permit applications and renewals
- ❖ Better understand how parking facility practices might affect the intent and effectiveness of the freeze
- ❖ Gain an accurate perspective of the orientation and layout of each facility
- ❖ Compare the rates and price structures of the facilities in South Boston in order to understand how pricing influences the effectiveness of the freeze



- ❖ Identify the details of each facility more quickly when working with the related maps of facilities in South Boston

These points led the discussions and were the basis for brainstorming additional fields for the database. All of the points investigate ways in which the BAPCC can obtain more detailed information for their own usage. By retrieving more specific data, the BAPCC would be able to either revise existing regulations or create new ones based on the new information obtained through the new fields in the database. The team kept this underlying goal in mind when developing the additional fields for the database.

### ***3.2 Inventory Parking Facilities***

Since the BAPCC is obligated by the Massachusetts SIP to update the parking freeze inventory every three years, previous work had been done related to this task. One goal of this project focused on verifying data as well as recording any other relevant observations. The last inventory was completed in 2003 by members of the commission, including the current head of the Environment Department. The fulfillment of this objective provided the BAPCC with the most current and accurate field information. Any analysis from that point on would now be based upon the current state of the parking facilities in South Boston, allowing the BAPCC to determine current problems and develop new control measures or policies to solve these problems. Planning for an accurate and comprehensive field survey included the following steps:

- ❖ **Identify all the facilities included in the freeze:** This included all parking facilities in South Boston that already existed in the inventory. The BAPCC provided the team with the current database of permit information. Current assessing information was received from the Boston Redevelopment Authority (BRA) which was used to verify the existence of parcels in the South Boston area and update ownership information, such as the owner name, facility address, and mailing address.
- ❖ **Obtain credentials for access to facilities:** Mr. Bryan Glascock, director of the Environment Department, supplied the team with credentials in the form of a letter addressed to the various parking facilities. This proved useful if any facility employees became suspicious of the team's surveying.
- ❖ **Create inventory sheet:** This was used in the field to record information about each facility. This sheet, shown in Appendix C, included the name and address of the facility,

the new fields that were added to the inventory, and the total number of spaces that should be present. The current inventory database was used to determine the number of parking spaces which should exist in each facility. This sheet was important in recording the team's findings in the field, and kept the information organized for input into the database later on.

- ❖ **Create survey protocol:** The protocol, shown in Appendix D, listed how the team would survey a facility, step-by-step, in order to ensure the completeness and efficiency of the survey.
- ❖ **Gather maps of each facility:** Maps of each facility are stored by the BAPCC in a file for each specific permit. These maps were copied and brought into the field in order to help the team orient itself when surveying each facility. The BRA provided the team with a large map of South Boston detailing each 2007 parcel of land that held a parking freeze permit (PFP). The map includes the facility's BAPCC ID and the total number of permitted spaces (from 2003). Copies of individual sections of this map were made so that the team could bring them out into the field to help in recognizing where parking was located in each facility.

The team decided to work in pairs while conducting the survey. This was a more efficient way for the team to survey the parking facilities. In addition, working in pairs made it easier to designate roles for surveying; one person would mark down observations on the stock sheet, while the other would take pictures of the facility, specifically of the entrance, exit, signage, and problem areas. These photos were organized by lot and then by type and will be used for reference purposes.

Every aspect of the survey needed to be considered prior to going out into the field. For example, a mechanical counter was used to keep track of the number of spaces in larger facilities. Another method used to calculate the number of parking spaces in the larger facilities was to count an entire row and then multiple that by the number of similar rows instead of counting similar rows multiple times. The total number for these types of spaces was simply added to the total number of spaces that were not aligned with these spaces, such as spaces along the boundaries of the facility.

After updating the parking freeze database through field surveying, all the data, including the new fields, were entered into the BAPCC database. The permit information that already existed in the database was compared to the new permit information discovered during the survey to check for accuracy. The data was analyzed to check for any common trends. An acceptable margin of error for actual spaces counted versus permitted spaces was set at 2% by Mr. Spector of the BAPCC. If the inventory count was within 2% of the existing database count, then the database count was unaltered. When differences greater than 2% were found, the database count was updated with the inventory count. At the conclusion of this process, it was intended that the BAPCC would be capable of using the project's observations and analysis of the current status of the South Boston parking freeze to revise their policies and regulations to more effectively reduce emissions from mobile sources.

The new information was not only used to update the BAPCC database, but to create new GIS layers as well. These layers displayed the location of the current parcels along with labels displaying the new parcel code and the number of parking spaces found in the field survey. Each layer represents a different aspect of the South Boston parking freeze, such as the parcel ownership, usage, or conditions of the area. The creation of these GIS layers will give the BAPCC a more descriptive view of the parking freeze, which will allow them to have a better basis for their decisions.

### ***3.3 Monitor & Analyze Off-Peaking Parking Policy***

As explained more fully in the Background chapter, facilities in the South Boston Piers Zone are required to close off 20% of their spaces between 7:30 and 9:30 a.m. This policy was implemented to discourage commuters from driving into South Boston, delay their commute until after rush hour, and save spaces for short-term visitors such as shoppers and tourists. There has been little done to monitor or analyze the off-peak parking policy in the Piers Zone since the South Boston parking freeze was implemented in 1993. This objective aided the BAPCC in gathering information on compliance with the off-peak parking policy and to recommend ways to improve upon the policy.

In order to complete this objective, the team went out in the field to collect information on how the policy was currently being implemented, analyzed the data to check for trends, and conducted a survey to gain insight into what factors affect drivers' decisions. From this

information a set of recommendations could be made on how the BAPCC could improve the off-peak policy in the Piers Zone. The following sections describe how compliance with the off-peak parking policy, facility usage, and commuter decision making were each investigated.

While conducting the field survey in the Piers Zone, the team checked compliance with the off-peak parking policy by counting the number of reserved spaces in each lot at 9:15 a.m. to make sure that 20% of the total spaces were set aside until 9:30 a.m. Methods used to close off the 20% set aside area of each lot were also noted.

The team also collected data on how full the lots were at various times during the morning. Data was collected on the number of empty spaces in each of the lots visited at 9:00, 9:30, and 10:00 a.m. since this could be an indicator of the effectiveness of the off-peak policy. Empty spaces could mean that the off-peak parking policy was having no effect since drivers could still find spots or that the policy was successful in delaying their commute until after rush hour. Analysis of this data is discussed later on. The team also observed whether or not cars were driving around the block, inside the lot, or just idling in the street waiting for a parking spot to become available at 9:30 a.m.

Some information could not be obtained solely through collecting data on the number of cars in each lot. A short survey was utilized to gain insight into:

- ❖ The reasons drivers went into South Boston
- ❖ Why drivers chose to utilize personal transportation instead of public transportation
- ❖ What effect, if any, the off-peak parking policy has on drivers

The questions asked in the survey are shown in Appendix E. The survey was conducted in a large pay lot in the northwest section of South Boston closest to Downtown Boston. This area was chosen because its close proximity to downtown is ideal for commuters. To increase the chances of drivers participating, the team wore shirts and ties and approached drivers by saying “Good morning, I am working with the Boston Environment Department to analyze the off-peak parking policy in South Boston. I would appreciate it if you would participate in a short survey. This will help the city of Boston and should not take more than five minutes.” Team members individually surveyed drivers from 9:15 a.m. to 10 a.m. as they walked from the lot. This time period allowed for drivers arriving early for the 9:30 a.m. opening to be surveyed as well as drivers who arrived shortly after the set aside area was opened.

Next, the team analyzed the information gathered during the field survey to look for any common trends. By looking at the data, it could be determined whether lots in a certain area are more popular and crowded than others, and if lots are complying with the policy. Data collected on the number of empty spaces in each lot at different times was analyzed to see if the lot was becoming full before the set aside area was opened. Since this information was collected only on one day, it may or may not be a good representation of the normal conditions.

After collecting and analyzing the data, recommendations were made as to how the BAPCC could improve its off-peak parking policy. Written recommendations were made such as the number of spaces that must be set aside, and the length of time they must be set aside. All of the recommendations were aimed to assist the BAPCC in achieving its goal of reducing air pollution from mobile sources by discouraging commuters from driving into the Piers Zone, while still allowing short term visitors to use personal transportation. The successful completion of this objective was important for the BAPCC in gaining insight into the effectiveness of the off-peak parking policy as well as ways to improve it.

### ***3.4 Create an Information Flow Plan for Electronic Submission of Permits***

The last major objective of this project was to deliver a plan to the BAPCC detailing how the parking freeze permit process could become an automated permit application process. This is due to the fact that the current permit process is a paper filing system, which creates problems with organizing the data as well as sharing information with other departments. The BAPCC would like to create an electronic system to replace the current system, which would allow land owners and developers to submit permit applications online. The BAPCC would also gain the ability to track the permit information and be able to update the parking freeze inventory.

There were several requirements of this information flow plan. Initially, the specific steps of the permit process were identified and examined. Recommendations for automating the permit process could not be made until the process was fully understood. The team used discussions with the Boston Transportation Department (BTD) and the BAPCC to identify the flow of information during the permit application process and all the people involved as well. From this, the team created a flow chart and information guide to explain the permit application process, as well as create an electronic form of the permit application. This information flow

plan was intended to be used as a foundation for the creation of an electronic system for the BAPCC permit application process.

While a majority of the attention about the South Boston parking freeze is focused upon the parking inventory, the permit process is also an integral part of the analysis. Automating the permit process will allow the BAPCC to better manage the parking freeze as well as provide access to the permit database to other departments

## 4 Results and Analysis

This chapter presents the end results of the project working with the Boston Air Pollution Control Commission. The team's findings are organized in this chapter according to project objective. The results of organizing the existing permit information as well as the addition of new fields are discussed first. Following that section are the results and analysis of the team's field survey. Analysis of the off-peak parking policy is given in the third section. The results of the team's automated permit process information flow plan are found near the end of the chapter.

### ***4.1 Analysis of the BAPCC Permit Database***

The team's discussions with city officials revealed a number of database fields that have significance for monitoring the different facilities under the South Boston Parking Freeze. This section will report the team's initial work with the BAPCC database, as well as the resulting additional fields which were chosen for the permit information.

To make the field survey as accurate as possible, the team reviewed, reorganized and analyzed the current permit information. The BAPCC database was compared with a database obtained from the Boston Assessing Department, which details specific facts and figures on the parcels of land in South Boston. The assessing database includes the parcel owner, address, and parking space inventory. The comparison of these two databases revealed that the data in the BAPCC database was not as current as the data in the assessing database for all of the ownership information. The team's results showed a surprisingly large number (39%) of ownership information did not match the PFP data, as well as 43% that was not in the assessing data at all. There is the possibility that the owners in South Boston have combined their parcels with the approval of the Assessing Department, and that the BAPCC currently considers them as separate parcels. The team went through and updated all the ownership information in the BAPCC database using the assessing information.

Based on discussion with officials from the BED and the BAPCC, the team identified what information should be added to the database and also collected in the field survey. Together the team decided to add the following fields:

- ❖ **An alphanumeric code** was created by the project team to store multiple pieces of information in a single field and to make it easier to locate the parking facilities on

necessary maps. The alphanumeric code is similar to the code that was used for the Downtown Boston parking freeze. The code is made up of three parts: the BAPCC ID, the type of the facility (surface or garage), and the first four letters of the street name. For example, 02.00SSUMM would describe the parcel with the BAPCC ID 02.00, the first S denotes that parking area is a surface lot, and the SUMM abbreviates Summer Street. This one code allows for easier map orientation and facility identification for people who are not as familiar with the parking freeze.

- ❖ **Zone** lists which parking freeze zone that the parking facility is located in: the Piers, Industrial/Commercial, or Residential zone.
- ❖ **Pricing** provides the facility's price rates. This allows the BAPCC or other departments to analyze the price distribution of parking facilities in South Boston.
- ❖ **Booth** indicates whether or not a facility has an attendant booth. If a facility had a booth, than a photograph was taken of its location. Pictures of the entrance, exit, signage, and problem areas in each facility were recorded as well. This information could prove useful for the BAPCC and other city departments later on if there are complaints about a certain facility. The BAPCC could use this information to deem the facility in violation of its permit requirements, and order the facility to make necessary improvements.
- ❖ **Zipcars** can be described as a car sharing program, the purpose of which is to reduce the use of personal vehicles and parking spaces in the city of Boston. While the BAPCC does not require facilities to provide Zipcars to the public, it would be beneficial to know where Zipcars are available for further studies.
- ❖ **Curbside Parking** was recorded so that possible trends could be analyzed. Curbside parking refers to the availability of on-street parking near the facility. A lack of on-street parking could impact the usage of a certain lot, pay structure, etc.
- ❖ **Lighting** indicates whether a facility has lighting or not. A parking area with lighting may charge more than a parking garage/lot without it. Lighting is also listed as a condition on many parking freeze permits.
- ❖ **Inventory** lists the number of spaces counted in the field survey. This is clearly an important field because it is the actual number of parking spaces that were found in the field survey. Along with the new inventory number, there is a field that indicates the



accuracy of that number with the number of permitted parking spaces that were supposed to be found in the field survey.

## **4.2 Analysis of the Field Survey**

The inventory of the parking spaces in South Boston revealed several findings that have implications on the effectiveness of the South Boston parking freeze. This section will report the differences found between the space counts and spaces indicated in the permit records, as well as several differences between the practices and characteristics in the Piers Zone and the Industrial/Commercial Zone.

A key finding of the field inventory was that in most facilities, the number of permitted spaces exceeds the total spaces counted by more than the allowed difference margin of 2%. Table 2 shows the average difference found for each facility, as well as the accumulated difference percentage for all the facilities. The average difference is just the average of the difference found for every facility. This is different from the accumulated difference, which was found by summing the inventory counts of all the facilities and finding the percent difference with the total permits currently issued to facilities in the South Boston area. A certain level of uncertainty exists due to the parcel boundary ambiguities that were encountered.

<b>Data Field</b>	<b># of Facilities</b>
Pricing	15
Booth	22
Lighting	92
Zipcar	3
Curbside	64
Fence	69
Permitted Total	28996
2007 Inventory Total	25146
Accumulated difference %	13.28
Avg. difference %	7.52

Table 2 Field Inventory Data

If the number of permitted spaces is not within the margin of difference compared to the actual number of spaces in the facilities, then it becomes an issue with the limitations of the freeze. Either facilities requested fewer spaces than the actual number in order to pay less in yearly fees, or they requested more in order to save spaces for future development of their

facilities. The inventory count found many facilities to have permit totals significantly larger than the actual totals.



Figure 9. Example of Poor Conditions in Industrial/Commercial Zone

The inventory also found that many lots did not have all the spaces clearly marked. Many cars were parked where there were no marked spaces, and were not counted as spaces. Ambiguities like these extended to the parcel borders as well, as parcel groupings were difficult to identify during the inventory. The difference in the total number of spaces could partly be a product of inaccuracies associated with the parcel

boundaries within South Boston. The team found it challenging to decipher the borders of several parcels in the area, which made assigning parking spaces to the correct parcel a tricky procedure. Since the 2007 map was provided to the team late into the field survey process, the 2003 parcels were initially used. The team tried its best to discover which parcels had merged together in an effort to attribute the appropriate number of counted spaces with the right parcels. It is important to have clearly defined parcel boundaries in order to keep track of which spaces are permitted to each facility so that the inventory can be properly updated.



Figure 10. Example of Abandoned Lot

There were several notable concerns with facilities in the Industrial/Commercial Zone. Almost none of the facilities had any price structures set up, since all the facilities were not intended for the general public. All but a handful of lots were also found to be well-kept. Figure 9 shows an example of the poor conditions found in this zone. Many of the lots were filled with trash or unsightly piles of old materials, and the landscaping around the lots was unattractive. The BAPCC has the authority to revoke a facility's permit if they are found to be in violation of any standards or regulations of the Boston Transportation Department, such as bad conditions. The team also found several abandoned lots, where the entire parcel was unused and unattended. Figure 10 shows one lot that was abandoned with grass and weeds growing up through the pavement. Lots like these are holding permits only for future use, and have no current parking capabilities. The BAPCC may grant a facility a permit based on future plans for development, but most of these facilities have no room for new development within their boundaries. These lots could end up keeping permitted spaces from other lots who could use them better.

The parking facilities in the Piers Zone were mostly public parking lots with price structures. Figure 11 shows an example of one of the pricing signs found in the Piers Zone. The team found that many of the commuter lots adjacent to Congress St. had the same price rates. Many had a daily rate of \$9. These lots were the largest public parking lots in South Boston, and were the most used by commuters.



Figure 11. Pricing in Piers Zone

Having descriptive price structures allows the BAPCC to compare rates and determine how price might influence parking trends in South Boston.

The team also found that the facilities in the Piers Zone were well-kept and serviced in comparison to those in the Industrial/Commercial Zone. Almost all of the public parking spaces were clearly marked, and had some type of personnel monitoring the facility. In addition,

several of the facilities allocate spaces for Zipcars in their lots. These facilities are not required to provide spaces for Zipcars. Figure 12 shows Zipcars that were in one lot in the Piers Zone. The team found that the Zipcars were the only form of ride-sharing program utilized by facilities



Figure 12. Zipcar Parking

in South Boston. There appeared to be plenty of free space in most facilities for spots that could be designated to ridesharing or carpooling.

The most important finding from the inventory was the accumulated difference percentage of 13% for the facility's actual space totals compared to the permit totals.

This percentage represents the number of permitted spaces that aren't yet realized by the facilities. This difference accounts for spaces not actually being used either due to abandonment, not being marked or able to physically fit in the facility. This is significantly larger than the acceptable margin for difference of 2% set prior to the inventory. The permits are far exceeding the actual number of spaces in facilities across the entire South Boston area, with the Industrial/Commercial Zone facilities having the majority of unrealized spaces.

With the new information gathered through the field inventory, the team created Geographic Information System (GIS) maps. These maps allow the data to be displayed in a medium that is easier to understand than a database. One of the GIS maps, shown in Figure 13, displays the parking facilities in South Boston according to owner. All of the parcels that have the same owner share the same color. This provides a way for the BAPCC to view number of facilities controlled by a given owner. These GIS maps are similar to the maps created for the BAPCC by the BRA. Another GIS map, shown in Figure 14, is organized by the actual number of parking spaces in a given facility. The map shows that the majority of the larger parking facilities are located in the Piers Zone.



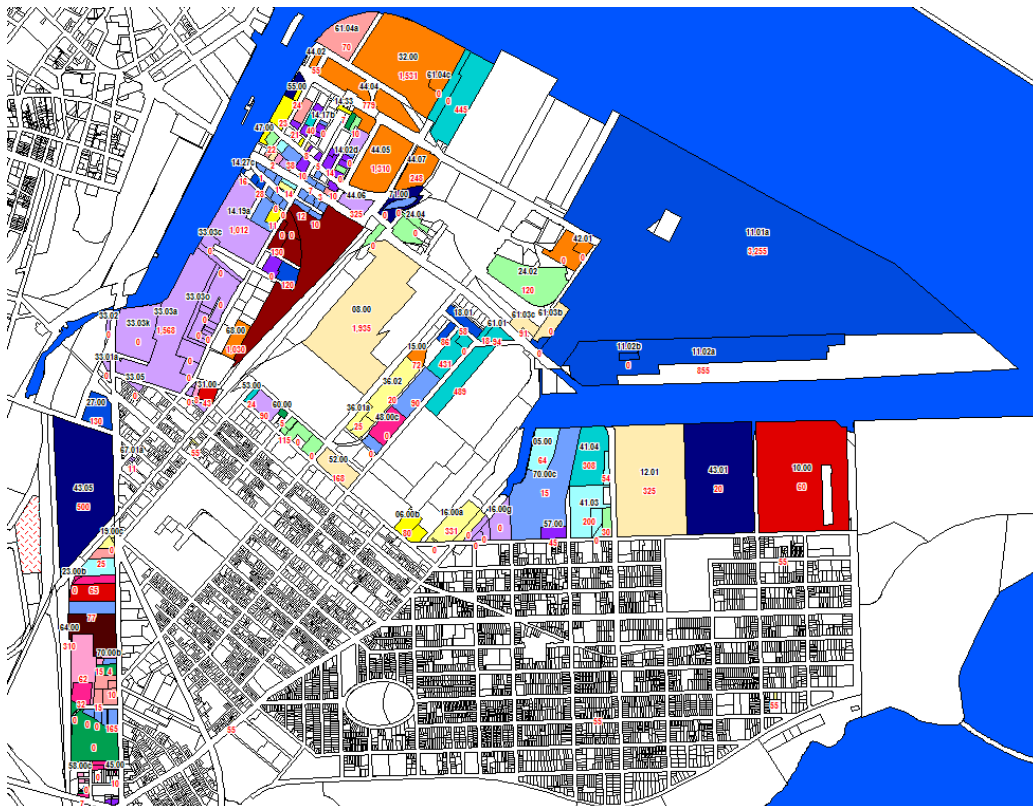


Figure 13. GIS Map Colored by Parcel Ownership

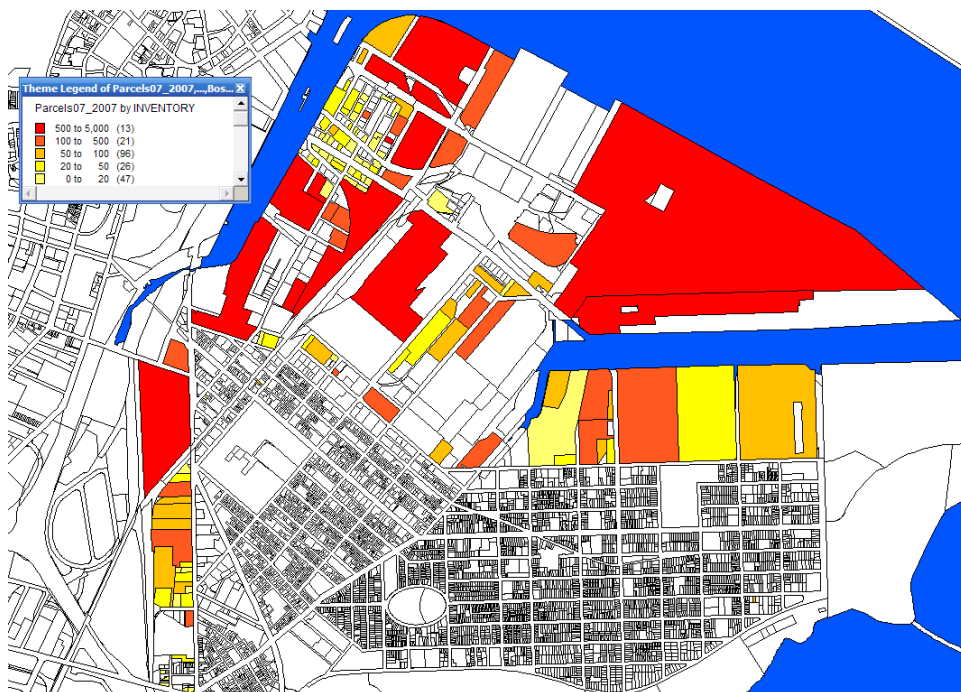


Figure 14. GIS Map Colored by Number of Parking Spaces

### 4.3 Analysis of the Off-Peak Parking Policy

The team analyzed the effectiveness of the off-peak parking policy in the Piers Zone in discouraging commuters from using personal transportation, delaying commuters' drive until after the morning rush hour, and saving parking spaces for short term visitors. The next few paragraphs describe the team's findings on the different goals of the off-peak parking policy.

The first goal of the off-peak parking policy is to encourage the use of public transportation. The survey, in which thirty-six out of ninety-five drivers participated, found that 97% of drivers were aware of the MBTA Silver Line and 64% had used it before. These findings show that most drivers use public transportation in South Boston. The Silver Line only services South Boston and Logan Airport, however it connects to the rest of the subway system. This gives South Boston indirect access to the entire subway system as well as the commuter rail. This survey only shows that drivers have utilized public transportation within the city and may or may not have used it from surrounding cities. Because the survey was conducted only in one South Boston parking facility on one day, the results can only suggest common trends and can not be used to make generalized conclusions about all drivers in South Boston. In order to draw conclusions about drivers in general, the survey will need to be continued in other parking facilities on different days.

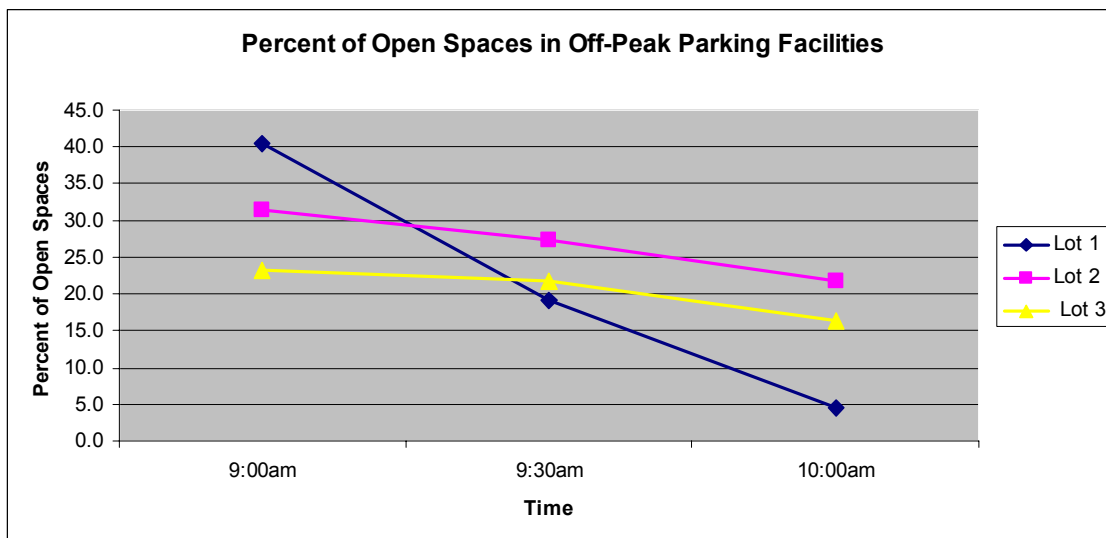


Figure 15. Availability of Parking Spaces

The team found that in regards to saving parking spaces for short term visitors, the off-peak parking policy may be effective. All thirty-six drivers surveyed were in South Boston for

work, most of who arrived after the set aside spaces were opened. This fact makes it appear that the off-peak parking policy is not effective in saving spaces for short term visitors, however the set aside spaces did not fill up before 10:00 a.m. Of the three parking facilities that enforced the off-peak parking policy, there were 22%, 16%, and 5% of each lot still available at 10:00 a.m., as shown in Figure 15. These spaces may have filled up with commuters if they had been available before 9:30 a.m.

The off-peak parking policy also aims to delay commuters from driving until after the morning rush hour. In surveying drivers, the team found that most (81%) drivers knew about the off-peak parking policy and 25% planned their commute around it. This finding seems to show that the policy has been effective in getting some commuters to go into work later in the day.

The team found that there is an overall lack of compliance with the BAPCC's off-peak parking policy in the Piers Zone. Twenty different land parcels with parking facilities were observed, with only 15% (3 parcels) blocking off any parking spaces. This number is slightly misleading due to the fact that a single owner may own a number of parking facilities. The BAPCC has allowed owners to choose which spaces they block off as long as it is greater than or equal to 20% of their total number of spaces. For instance, an owner may own two separate lots, one lot with 200 spaces and another with 800. That owner is allowed to close 100% of the smaller lot and 0% of larger lot in order to comply with the off-peak parking policy.

In addition to an overall lack of compliance with the policy, facilities that do set aside spaces do not fully comply. All three lots with set aside spaces made those spaces available before 9:30 a.m. Two of the lots opened the blocked off area at 9:00 a.m. and the other at 9:20 a.m. The percentage of spaces set aside was also below the 20% minimum in all three lots. One owner set aside 16% of their total spaces and another only 10%. The third facility, located on the line between the Piers Zone and the Industrial/Commercial Zone, blocked off 12% of their spaces. Because this facility falls into both zones, the BAPCC has agreed upon a certain percentage of spaces that the facility must set aside since the entire facility is not in the Piers Zone. These facilities were only observed on a single occasion and therefore may or may not be indicative of the facility's normal practices.

Through the field survey it was found that the off-peak parking policy has less of an effect on the availability of parking spaces in the Piers Zone than anticipated. Poor compliance with the policy is one major factor for its limited impact. The other reason is that there are a

large number of employee and tenant only parking facilities in the area which do not seem to enforce the policy at all. These facilities are not for intended for the general public and may be used for company vehicles such as construction vehicles. Compliance in these private facilities is very poor.



Figure 16. Cars Lining Up in Piers Zone

While observing the effectiveness of the off-peak parking policy, the team found an undesirable side effect of the policy. The team found that there was much higher demand for parking in some facilities than in others, leading drivers to drive around waiting for a parking spot. Price and location are likely the cause as most drivers (58%) surveyed said that location was the most important factor in choosing a parking facility. Twenty-two percent of drivers said price was their main reason for choosing a lot. Price is less of a



Figure 17. Section of Parcel Map

factor in the South Boston Piers Zone because many facilities have the same price structure. The problem is that some facilities were completely filled before 9:30 a.m. while most had plenty of available spaces. Cars began to line up inside of full lot waiting for the set aside spaces to open up. Figure 16 shows cars lining up waiting for parking spaces to become available at 9:30 a.m. The team found that at 9:15 a.m., cars began to drive around and

line up inside of a Congress Street parking lot, outlined in red in Figure 17, because the rest of the lot was full. Meanwhile, a parking lot on Northern Avenue, one street over, had 155 empty



spaces at 9:30 a.m. The Northern Avenue lot is outlined in blue in Figure 17. Both lots charge \$9 from 5:00 a.m. to Midnight. A \$10 a day lot on A Street also had 102 empty spaces at 9:30 a.m. This is the opposite of what the BAPCC and the off-peak parking policy intends to accomplish. Cars idling in the street or driving around a lot waiting for a parking space creates more air pollution than if the drivers could have just gone and parked.

Overall, it is difficult to determine the effectiveness of the off-peak parking policy in encouraging public transportation, delaying drivers' commute, and saving spaces for short term visitors. In general, there is poor compliance with the policy. With more widespread compliance, the policy could be very effective. The team found that there are indications that commuters have planned around this policy and that some parking spaces are being left available for drivers later in the day.

#### ***4.4 Creation of an Information Flow Plan for Electronic Submission of Permits***

The discussion with BAPCC and BTM officials regarding the permit application process uncovered the importance of information flow in the effectiveness of the South Boston Parking Freeze. This section will report the team's development of an information flow plan which is intended to be used as a foundation for the creation of an electronic permit application system.

The team created an information flow plan to incorporate the parking freeze permit (PFP) process into the citywide automated application process. This information flow plan includes three major components: a new electronic PFP application form, a flow chart outlining the BAPCC application process, and a written document explaining each step of the process. These step by step instructions help to simplify the application process for new parking freeze permits so that it will be easier to create an electronic submission system in the future. The current PFP application process is a paper filing system which is difficult to maintain as documents accumulate over time. An online version of the PFP application will be more convenient for the applicant, as well as reduce the amount of time the staff needs to spend transferring data from the application form to the BAPCC database.

The application form is based on the current PFP application, but has been modified to gather additional information. These modifications are a result of meetings with the head of planning for the BTM and officials of the BED. Our new application form, shown in Appendix

L, was created using a Microsoft program called InfoPath, which is compatible with many different programs. This includes MS Access and the BAPCC's website, as well as the ability to be used as a paper application, which the BAPPC is required to provide. The application form also hides certain sections of the form until the related condition is filled. For example, some fields require a simple yes or no, and if they fill in yes the form will ask them to go into further detail. This allows the form to be simplified for applicants who only need to fill the minimum requirements on the form. The form also automatically calculates the total fee that the applicant needs to pay for the number of spaces they have applied for.

The team also gathered information on the flow of information during the permit application process. This flow chart, shown in Appendix K, shows the steps in the application process starting with the applicant all the way to the BAPCC decision. This is an important part of the plan for creating an electronic application process because the process must be fully understood before a new process can be created. Automating the permit process will be a simpler task with this plan to base their efforts on.

## 5 Conclusions & Recommendations

The following section presents conclusions and subsequent recommendations which were formed from the results of the project. The following is a list of the recommendations produced by the team:

- ❖ Utilize MS Access for BAPCC database
- ❖ Improve communication with the Boston Assessing Department
- ❖ Expand the permit database to include additional fields
- ❖ Reduce permit totals for individual facilities
- ❖ Conduct annual compliance check of off-peak parking policy
- ❖ Exempt owners with fewer than 100 parking spaces from the off-peak parking policy
- ❖ Create detailed guide outlining off-peak parking policy
- ❖ Use information flow plan as foundation for automated permit process

The recommendations are now discussed in detail. The importance of each recommendation to the BAPCC is also expressed.

- ❖ **Utilize MS Access as format for the BAPCC database:** The BAPCC currently uses MS Excel to manage their parking freeze permit database. After updating and revising this database, it is important that the information be kept more organized and easily updatable in order to sustain the valuable work accomplished through this project. Because of this, the team recommends that the BAPCC rely on MS Access to manage its permit information. MS Access databases are able to be directly linked to a GIS mapping program such as MapInfo, which the team produced for this project, or ArcGIS which the Boston Redevelopment Authority (BRA) uses to create GIS maps. The team created a submission form for PFP applications using MS InfoPath. MS Access can link to InfoPath which would allow all the data in the submission form to be automatically stored into the database. The permit information is a crucial part of the parking freeze, and the BAPCC relies upon this information to monitor and manage the freeze effectively. By using MS Access, the information can be easily updated and linked directly to other important materials related to the freeze such as the GIS maps. This increased level of efficiency would be greatly beneficial to the success of the freeze, specifically to the BAPCC's ability to track, update, and analyze the information.
- ❖ **Improve communication with the Boston Assessing Department:** The team received assessing information from the BRA and compared it with the BAPCC parking freeze permit (PFP) database. The team's results showed a surprisingly large number (39%) of ownership information did not match the PFP data, as well as 43% that was not in the assessing data at all. It is necessary that the BAPCC has current permit information in order to make the most appropriate decisions. Therefore, we recommend that BAPCC improve communication with Assessing Department in order for both parties to have the most accurate information, rather than having to go through other departments.

- ❖ **Expand the permit database to include additional fields:** The team met with the Head of Planning of the Boston Transportation Department (BTD), in addition to Mr. Glascock and Mr. Spector of the Environment Department and Air Pollution Control Commission respectively, to discuss which fields could be added to the database in order to benefit both departments. The team recommends that the BAPCC expand the amount of information kept in the permit database to include additional fields such as zone, booth, lighting, Zipcars, curbside parking, and fencing. These fields will allow BAPCC to have a better overview of the condition of the parking facilities in a given area. The fields will only be added to the database, and updated during each inventory. The fields are not to be added to the permit in order to maintain the simplicity of the permit. The more detailed information would allow the BAPCC to observe the facilities more closely, and would enable them to create policies based on the more detailed information.
- ❖ **Reduce permit totals for individual facilities:** The results of the field survey showed that a significant number of the facilities in South Boston, specifically the Industrial/Commercial Zone, had permitted space totals which were sizably above the actual space totals observed by the team. Many of these facilities simply cannot hold the number of permitted spaces, while others choose to not even mark off spaces on their property. In order to address these problems, the team recommends that the BAPCC reduce the number of permitted spaces for facilities with actual totals significantly less than the current permitted total.

Even considering future development, the team's findings support a tightening of the freeze's permit totals. Reducing the total of permitted spaces would eliminate some inefficiency which exists in the utilization of permitted spaces by a number of facilities. To maintain governance of the freeze policies, and to keep with the regulations of the parking freeze, it is strongly recommended that these unused spots be absorbed back into the freeze bank. The regulations call for all permitted spaces to be used. The unused spaces can be put back into the freeze bank, and could take the place of the 10% increase that is scheduled, but may end up proving to be useless since facilities currently have too many permitted spaces. The BAPCC may be able to prevent the unwanted increase by reclaiming the unused spaces into the bank for any future development.

- ❖ **Conduct annual compliance check of off-peak parking policy:** Findings of from the analysis of the off-peak parking policy made it clear that many of the facilities in the Piers Zone simply do not abide by the BAPCC policy. Only a select few of the larger, more commuter-based lots actually attempted to fulfill the requirements of the off-peak policy by blocking off a percentage of their spaces during the designated morning hours. None of those lots were fully compliant in reserving the correct amount of spaces for the appropriate amount of time. To resolve this issue, the team recommends the BAPCC conduct at least an annual compliance check of the off-peak policy.

It is important that the BAPCC be more authoritative with its policies in order to encourage the participation of the facilities in those policies which contribute to the success of the parking freeze. Performing a compliance check on a regular, or even unspecified basis would convey to the facilities the importance and value this policy has for parking in the city. In addition to an annual verification of compliance, the team recommends that the BAPCC institute a reward for those facilities found to be compliant

on a yearly basis. By establishing a reward for strong participation in the policy, facilities will be highly motivated to fully comply. Perhaps a reduced per-space yearly fee could be rewarded to facilities that comply a specified number of years in a row. Or the reduced fee could be given to any facility that is found to be compliant every year. The amount of the reduced fee is left to the discretion of the BAPCC, who uses the fees as a source of revenue.

- ❖ **Exempt owners with fewer than 100 parking spaces from the off-peak parking policy:** The team has concluded that it will be beneficial for the BAPCC to exempt smaller facilities in order to focus on the enforcement of the policy upon larger parking facilities. It is suggested that facilities with less than 100 spaces be exempt, since these facilities have a relatively small impact on commuters. This recommendation would result in 30 out of 40 owners being exempt from the policy, equivalent to a 70% decrease in the total number of owners affected by the policy. However, this change would only affect 687 spaces out of 17,214; a 4% decrease in the total number of spaces. Appendix M illustrates this point. This shows that exempting owners with fewer than 100 spaces would significantly reduce the number of owners that the BAPCC would have to get to comply with the policy while not drastically reducing the total number of spaces set aside.
- ❖ **Create detailed guide outlining off-peak parking policy:** This project has found that there is poor awareness of the purpose of the off-peak parking policy. Surveyed commuters did not know why facilities blocked off spaces until 9:30 a.m. Also, the poor compliance with the policy by owners could be linked to poor awareness as well. For these reasons, a guide should be produced to give the motives for the freeze and how it works. Distributing this guide to parking facilities would attempt to raise compliance by educating parking attendants at the various facilities. The team is also recommending that standard signage be produced and distributed to all the parking facilities required to set aside spaces. These signs would improve awareness with the policy as well as improve compliance by making it easier for facilities to enforce the policy. The success of the freeze relies on the public's awareness and acceptance of its purpose and policies, therefore the BAPCC must educate the public as to the goals and policies of the freeze.
- ❖ **Use information flow plan as foundation for automated permit process:** The result of the team's work in creating an information flow plan for the BAPCC permit process indicates that the BAPCC would benefit from using it as a ground work for the development of an electronic system for parking freeze permits.

The BAPCC is in need of this electronic system, mainly because the current, paper-based system is inefficient and the information is not capable of being easily tracked or updated. An electronic system would significantly enhance the management of permit information as well as reduce the time for information to flow to different entities during the application process. Part of the stagnant condition of the permit information can be attributed to the inadequacy of the current permit organization. The BAPCC would be able to manage and utilize the freeze's information much better with the creation of an electronic system designed to handle permit applications. The information

flow plan can provide the department with an excellent starting point for the requirements of the system as well as the electronic permit form for the system.

The recommendations presented here all focus on helping the BAPCC better organize its information as well as make the parking freeze in South Boston more successful in encouraging mass transportation. The experiences of the team during the project have illustrated that the freeze is capable of improving its efficiency and governance of its policies and information. These recommendations will increase the effects of the freeze on commuters and facilities as well. The overall goal of the freeze, to reduce air pollution from mobile sources, would benefit from a more strictly managed freeze by the BAPCC. Since no data or studies have been conducted to examine the environmental accomplishments of the parking freeze, the project was aimed towards improving the ability of the BAPCC to manage the freeze. The BAPCC is the main beneficiary of this project's work, and can use the team's findings to better understand the current status of the parking freeze. A fully electronic permit application system could enhance the tracking, monitoring and evaluation of the freeze. Most importantly, it would be extremely valuable to see what the actual environmental implications of the parking freeze are in order to quantitatively measure the success of the parking freeze in reducing air pollution from mobile sources.

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## **Appendix A: Boston Air Pollution Control Commission**

### **Boston Environment Department (BED)**

This is a conglomerate of organizations (commissions) which protect the heritage and environment of the city. Their goals are to protect Boston's man-made and natural environment and supply information regarding environmental issues in the city. To protect the city's abundance of historic locations, buildings, landscapes, and waterways by protective designation and review. Their actual mission statement says:

“The mission of the Environment Department is to enhance the quality of life in Boston by protecting air, water, and land resources, and by preserving and improving the integrity of Boston's architectural and historic resources.”

The Environment Department is also very clear about their performance objectives:

To maximize protection of the environment by providing comments on behalf of the City on Environmental Impact Statements/Reports (EIS/Rs), Chapter 91 notifications, and other federal and state reviews. To preserve historic character and significant architectural features in the City. To guarantee public access to the water's edge. To protect air quality via permitting and enforcement.

The Department oversees and improves the efficiency through coordination of 6 other environmental/historical departments/programs: Boston Conservation Commission, Historic District Commission, Boston Landmarks Commission, Central Artery Environment Oversight, City Archeology Program, and Air Pollution Control Commission. This project is trying to address the issue of increased VMTs in the city which are the main contributor to air pollution via automobile emissions. The reduction of VMTs are the focus of the Departments aim to protect air quality in the city (*Air pollution control commission*).

### **Boston Air Pollution Control Commission (BAPCC)**

This is a department under the Boston Environment Department which enforces city/state air/noise pollution regulations. The BAPCC's mission is to protect air quality in the city by addressing: Air pollution, Parking, Abrasive blasting, Noise.

Listed Performance Objectives: “The BAPCC writes and enforces regulations, grants permits, advises other City Hall departments, holds public hearings, and cooperates with other local, regional, state, and federal agencies in the pursuit of common goals.”

The commission has 5 commissioners, 3 of which are appointed by the mayor. So there is a constant rotation of leaders which makes it hard to solidify certain policies. The major issue this project is dealing with is the air pollution created by automobiles which has become a serious problem to Boston’s environment. BAPCC is trying to lower air pollution through VMT reduction by granting a limited number of permits, promoting the use of public transit system. South Boston Parking Freeze is one of three parking freezes in the City of Boston. In order to analyze the effectiveness of the instated parking freeze, a database to house the information is necessary.

The BAPCC works with the Boston Transportation Department to enforce enacted parking regulations such as the South Boston Parking Freeze and to retrieve necessary data in regards to traffic congestion. Our sponsor also coordinates with the Boston Redevelopment Authority to generate any necessary GIS maps for the freeze. Also, the BAPCC has required annual reports they must provide to the Massachusetts Environmental Protection Agency in order to keep them informed of the freeze’s progress.

## **Appendix B: South Boston Parking Freeze Area**

### **The South Boston Piers Zone:**

Beginning at the point where Mount Washington Street meets the high water line of the Fort Point Channel and continuing in a westerly direction to the center point of the Channel; then northeasterly along the imaginary center line of the Channel to the Boston Inner Harbor; then continuing southeasterly along the high water line to the southern center point of the Reserved Channel and continuing westerly in a straight line along the Channel direction to a point where it meets Summer Street; then following Summer Street in a northwesterly direction to a point where it meets Fargo Street; then following Summer Street in a northwesterly direction to a point along Fargo Street where it meets B Street; then westerly along an imaginary straight line back to the point where Mount Washington meets the high water line.

### **The South Boston Industrial/Commercial Zone:**

Beginning at the point where Southampton Street meets the railroad tracks and continuing northerly along the railroad tracks, to the West Fourth Street Bridge; then southeasterly along the Bridge to the center point of the Fort Point Channel; then north and northeasterly along the center line of the Channel to the point where it meets the imaginary line extending to the point to the beginning of the Piers Zone to its end point where it meets the imaginary line extending easterly along the center line of Reserved Channel and then southerly in a straight line to the point where it meets the northeastern edge of the residential Zone boundary line; then following said boundary line westerly, northerly, and southerly back to the point where Southampton Street meets the railroad tracks.

### **The South Boston Residential Zone:**

Beginning at the point where Southampton Street meets Dorchester Avenue, and continuing in a northerly direction along Dorchester Avenue, to West Second Street; then southeasterly along West Second Street, to B Street; then northwesterly along B Street to West First Street; then southerly along West First Street to the point where it meets East First Street and continuing along East First Street to the point where it meets Day Boulevard; then following along Day Boulevard in a southwesterly direction to the point where it meets Preble Street and continuing along Preble Street back to the point where Southampton Street meets Dorchester Avenue. (Boston Air Pollution Control Commission, 2006)

## Appendix C: Field Inventory Sheet (sample)

APCC Type	Total-2006	ST_NUM	ST_NAME	CODE	ZONE	Pay Structure	Price	Booth	Lighting
05.00 Surface	79 530		E. FIRST STREET	05.00SEFIR	IC				
06.00a Surface	0 300 - 370		W. FIRST STREET	06.00aSWFIR	IC				
06.00b Surface	100 300 - 370		W. FIRST STREET	06.00bSWFIR	IC				
10.00 Surface	60 300		E. FIRST STREET	10.00SEFIR	IC				
12.01 Surface	325 610		E. FIRST STREET	12.01SEFIR	IC				
14.19b Surface	0 244		A STREET	14.19bSA	IC				
14.19c Surface	0		A STREET	14.19cSA	IC				
14.19d Surface	0 232		A STREET	14.19dSA	IC				
14.23b Surface	0 56		MIDWAY STREET	14.23bMIDW	IC				
15.00 Surface	80 411		D STREET	15.00SD	IC				
16.00a Surface	331 426		E. FIRST STREET	16.00aSEFIR	IC				
16.00b Surface	0 426		E. FIRST STREET	16.00bSEFIR	IC				
16.00c Surface	0 426		E. FIRST STREET	16.00cSEFIR	IC				
16.00d Surface	0 426		E. FIRST STREET	16.00dSEFIR	IC				
16.00e Surface	0 462		E. FIRST STREET	16.00eSEFIR	IC				
16.00f Surface	0 478		E. FIRST STREET	16.00fSEFIR	IC				
16.00g Surface	0 480		E. FIRST STREET	16.00gSEFIR	IC				
17.00 Surface	90 184		W. FIRST STREET	17.00SWFIR	IC				
18.30 Surface	86		FARGO STREET LOT	18.30SFARG	IC				
19.00a Surface	25 285		DORCHESTER AVE.	19.00aSDORC	IC				
19.00b Surface	0 285		DORCHESTER AVE.	19.00bSDORC	IC				
19.00c Surface	0 285		DORCHESTER AVE.	19.00cSDORC	IC				
20.01a Surface	30 1		ELLERY STREET	20.01aSELLE	IC				
20.01b Surface	0 1		ELLERY STREET	20.01bSELLE	IC				
20.02 Surface	8 13 - 19		ELLERY STREET	20.02SELLE	IC				
22.00 Surface	62 4		ALGER STREET	22.00SALGE	IC				
23.00a Surface	65 323		DORCHESTER AVE.	23.00aSDORC	IC				
23.00b Surface	0 323		DORCHESTER AVE.	23.00bSDORC	IC				
27.00 Surface	130 9		W. BROADWAY STREET	27.00SWBRO	IC				
28.01 Garage	20 409		DORCHESTER AVE.	28.01GDDORC	IC				
28.02 Surface	15 409		DORCHESTER AVE.	28.02SDORC	IC				
29.00a Surface	110 41		WORMWOOD STREET	29.00aSWORM	IC				
29.00b Surface	0 33		WORMWOOD STREET	29.00bSWORM	IC				
29.00c Surface	0 11		WORMWOOD STREET	29.00cSWORM	IC				
29.00d Surface	0 23		WORMWOOD STREET	29.00dSWORM	IC				
31.00 Surface	43 105		W. FIRST STREET	31.00SWFIRS	IC				
33.01a Surface	0		SOUTH BOSTON MANUFACTUR	33.01aSSOUT	IC				
33.01b Surface	0		SOUTH BOSTON MANUFACTUR	33.01bSSOUT	IC				
33.02 Surface	0		SOUTH BOSTON MANUFACTUR	33.02SSOUT	IC				
33.03a Surface	1798		SOUTH BOSTON MANUFACTUR	33.03aSSOUT	IC				
33.03b Surface	0		SOUTH BOSTON MANUFACTUR	33.03bSSOUT	IC				

## **Appendix D: Field Survey Protocol**

### **South Boston Parking Freeze Group**

Worcester Polytechnic Institute  
100 Institute Road  
Worcester, MA 01609

#### Field Inventory Protocol

- Check street address and number
- Count total number of parking spaces
- Fill in additional field information:
  - Pay Structure
  - Price
  - Booth - location
  - Lighting (Y/N)
  - Zip Cars (Y/N)
  - Curbside (Y/N)
  - Conditions
- Take pictures of:
  - Entrance View
  - Exit View
  - Signage
  - Booth
  - Problem Areas

## **Appendix E: Commuter Survey**

### **South Boston Parking Freeze Group**

Worcester Polytechnic Institute  
100 Institute Road  
Worcester, MA 01609

Expected Survey Date: Tuesday April 10, 2007

Time: 9:15- 10:00 a.m.

APCC LOT # 44.05

Good morning, I am working with the Boston Environment Department to analyze the off-peak parking policy in South Boston. I would appreciate it if you would participate in a short survey. This will help the city of Boston and should not take more than a couple of minutes.

#### Survey Questions

1. Why are you parking in South Boston today? (e.g. work, shopping, visiting)
2. How long was your drive?
3. Why did you choose this lot in particular?
4. What are the reasons you decided to drive rather than use public transportation?
5. Do you know about the new MBTA Silver Line and have you ever used it?
6. Are you aware of the off-peak parking policy and if so, do you plan your day around this policy?

Comments:

## Appendix F: Permit Requirements

### South Boston Parking Freeze Permits

PIERS & INDUSTRIAL ZONES		<i>Existing spaces</i>	<i>New spaces</i>
	<b>RESIDENTIAL SPACES</b>	No Permit Required	***Permit Required: <b>New or Modified</b>
	<b>Commercial-use spaces</b>	Permit Required: <i>INITIAL OR RENEWAL</i>	Permit Required: <b>New or Modified</b>
Residential Zone	<b>RESIDENTIAL SPACES</b>	No Permit Required	No Permit Required
	<b>Commercial-use spaces</b>	No Permit Required	†††No Permit Required

\*\*\***Permit Required:** Creating new residential parking spaces in these zones requires an APCC permit. Applicant must apply for a New or Modified Permit. Applicant will receive either the Parking Freeze Permit or a Certificate of Exemption.

†††**No Permit Required:** Creating commercial-use parking within the Residential Zone does not require an APCC permit. **Note:** Creating remote parking for commercial-use outside the Residential Zone (such as remote parking for facilities within the Commercial or Industrial Zones is prohibited

(Boston Air Pollution Control Commission, 2006)



## Appendix G: Permit Application

### CITY OF BOSTON ENVIRONMENT DEPARTMENT AIR POLLUTION CONTROL COMMISSION (APCC)

#### ----- NEW OR MODIFIED PARKING FREEZE PERMIT (PFP) APPLICATION

**NOTICE:** PLEASE READ ALL INSTRUCTIONS BEFORE COMPLETING THIS APPLICATION. APPLICATIONS THAT ARE INCOMPLETE OR HAVE ERRORS WILL NOT BE ACCEPTED AND WILL NOT TOLL ANY DEADLINES.

1. Parcel ID #: \_\_\_\_\_ (Assessing Department #)

Name, address of facility:	Name, address of owner:

Name, address of contact person:	Name and address of lessee, if any:

2. Attach written proof that applicant is owner of record or has written approval from the owner of record to file application. [See instructions.]

3. Type of Request:      \_\_\_ New Facility?      \_\_\_ Existing Facility?

4.

Freeze Area	Total # of spaces	# of new spaces	# of existing spaces
Downtown	X	X	X
South Boston			
East Boston	X	X	X

5.

Type of Spaces	Commercial	Residential	Employee
Downtown	X	X	X
South Boston			
East Boston	X	X	X

6. Total square footage of property referred to in this application: \_\_\_\_\_ SF.

7. Gross square footage of all occupied buildings on the property, whether occupied for residential, commercial, retail, manufacturing, or any other purpose.

Purpose	Square Footage

8. Attach a site plan or floor plan of the parking lot or garage, showing:

- ☐ location of the facility; ☐ entry and exit points; and  
☐ layout of the spaces; ☐ total square footage of the parking area.

9. Provide ratio of proposed parking spaces to # of patrons. [see instructions]

\_\_\_ parking spaces for \_\_\_ employees; \_\_\_ residents; \_\_\_ other patrons

10. Indicate the proposed parking rate structure, if any:

- ☐ \_\_\_ per hour, \_\_\_ per day; \_\_\_ per month.  
☐ these rates are in effect: \_\_\_\_\_ (days of the week).

11. Current parking method(s) in effect on the property (check all that apply):

- ☐ valet ☐ self-parking ☐ surface ☐ garage

12. List all supporting documents and/or appendices accompanying this application.

\_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

13. Please verify all the information you have supplied above and enclose a check or money order for the application fee (\$10 per parking space) with your application, made payable to the "City of Boston, Air Pollution Control Commission."

If the application is in all respects an accurate and complete document and full payment is enclosed, then a hearing date and time shall immediately issue.

APPLICABLE FEE: \_\_, \_\_ spaces x \$10/ space = \$\_\_, \_\_\_\_.

PAYMENT SUBMITTED BY: ☐ Check ☐ Money Order.

*I hereby attest that this document contains, in all respects,  
 true, accurate and complete information.*

Signed, \_\_\_\_\_

Date \_\_\_\_\_

## Appendix H: Permit Instructions

### CITY OF BOSTON ENVIRONMENT DEPARTMENT AIR POLLUTION CONTROL COMMISSION (APCC)

#### INSTRUCTIONS ON APPLYING FOR A NEW OR MODIFIED SOUTH BOSTON PARKING FREEZE PERMIT (PFP) [pursuant to 310 CMR 7.33]

##### 1. WHO MUST FILE FOR A NEW OR MODIFIED PARKING FREEZE PERMIT?

There are three (3) distinct zones within the South Boston Parking Freeze area: (1) the Piers Zone, (2) the Commercial/Industrial Zone, and (3) the Residential Zone. The following landowners must file a New or Modified application with the Air Pollution Control Commission for a Parking Freeze Permit (PFP).

- Landowners that seek to create new residential, off-street parking on property within the Piers Zone or the Commercial/Industrial Zone need to apply for a New or Modified PFP. One of two outcomes will result:
  - If the proposed ratio of parking to living space DOES NOT exceed one parking space per dwelling, a Certificate of Exemption will automatically be issued.
  - If the proposed ratio of parking to living space DOES exceed one parking space per dwelling, the applicant must request a hearing before the Air Pollution Control Commission.
- Landowners that seek to modify the total number of existing non-residential, off-street parking spaces on property within the Piers Zone or the Commercial/ Industrial Zone.

Written proof that the applicant is the owner of record (photocopies will satisfy) or has written approval from the owner of record is required in order to file an application for the property. In the case of condominiums or cooperatives, written approval of the board of trustees or their equivalent will satisfy.

Landowners that do not fit into any of the above categories MAY STILL NEED TO APPLY for a PFP. See also #2 below.

## 2. WHO DOES NOT NEED TO FILE FOR A PARKING FREEZE PERMIT?

Landowners with existing residential, off-street parking spaces on property within any of the three (3) South Boston Parking Freeze zones DO NOT need to apply for a PFP.

- Landowners that seek to create new residential, off-street parking spaces on property within the Residential Zone DO NOT need to apply for a PFP.
- Landowners that seek to create new commercial-use, off-street parking spaces on property within the Residential Zone that will serve businesses within the Residential Zone DO NOT need to apply for a PFP.

## 3. SHOULD I FILE ANOTHER APPLICATION INSTEAD?

If you still have questions about which PFP application you should file, please contact the APCC at (617) 635-2516 during normal business hours or APCC@cityofboston.gov.

## 4. HOW AND WHERE TO FILE?

You must file seven (7) paper copies of your New or Modified Parking Freeze Permit application, as well as one (1) electronic copy. This can either be saved to a CD or floppy disk and enclosed with the paper copies, or it can e-mailed to APPC@cityofboston.gov as an attachment.

All New or Modified Parking Freeze Permit (PFP) applications must be received by the receptionist at the Environment Department during normal business hours (Monday to Friday, 9 a.m. to 5 p.m.):

Executive Director  
Air Pollution Control Commission  
City of Boston Environment Department  
One City Hall Plaza, Room 805  
Boston, MA 02201

5. IMPORTANT: New and Modified applications require a public hearing before the Air Pollution Control Commission.

- An applicant must file a complete application no later than sixty (60) days prior to the next scheduled hearing to be heard at that hearing.
- Applications filed less than sixty (60) days prior to the next scheduled hearing will be heard at the following hearing.

6. COMPLETING THE APPLICATION:

- Please complete all sections of your application with the information requested, and mark "not applicable" or "n/a" where appropriate.
- Accurate and complete applications that are signed, dated, and accompanied by the application fee, will be eligible for the first available hearing. Notice of the hearing date and time will immediately issue.

7. SOME REMARKS ON THE APPLICATION QUESTIONS:

- Question 2: Please ensure that you are the owner or owner's agent for the parcel of land listed in Question 1. Then enclose written proof of ownership or agency, such as a photocopy of last year's Assessing Department bill, a statement from the owner, or another reliable document. For help finding a parcel ID number, contact the Assessing Department at (617) 635-4264 during normal business hours.
- Question 4: Identification numbers are assigned to parcels of land by the Assessing Department in order to assess property taxes. To verify your Parcel ID number, please examine the last property tax return you filed. For help finding these numbers, phone the Assessing Department at (617) 635-4264 during normal business hours.
- Questions 7 & 8: These questions assume that most properties will contain both occupied buildings and accompanying parking and seeks to understand the activities occurring in the occupied building, as well as the square footage of each.

- Questions 9: To answer question 9, the site plan or floor plan need not consist of professionally-prepared blueprints or schematics. While copies of such documents are helpful, a basic good-faith sketch addressing the four points requested would satisfy.
- Question 10: An exact count of patrons is not necessary to answer this question. An approximation will satisfy.

8. PERMIT APPLICATION FEE: Please enclose a check or money order for the non-refundable permit application fee (\$10 per parking space) made payable to: City of Boston Air Pollution Control Commission with your application. If your application is in all respects a complete and accurate document, and is approved by the APCC, a permit shall issue. No permit shall issue until payment of the application fee has been received.

9. SIGNED AND DATED APPLICATIONS: The application must be signed and dated by the applicant. The applicant's signature attests that the information contained in the application is accurate and complete.

10. APPENDIX A: After completing the basic application and attaching all necessary documents, please complete Appendix A, "Statement of Need for the Proposed Facility." You should give a general description of the facility and the parking needs of local entities and patrons that the proposed facility will serve. Any written proof (letters, etc.) that you wish to supply in support of this statement should be attached to Appendix A.

#### WARNING!

- Failure of a landowner to comply with South Boston Parking Freeze Regulations will subject him or her to APCC violations and fines.
- Failure of a permit-holder to comply with the terms of his or her Parking Freeze Permit will subject him or her to APCC violations and fines.
- Every day that an APCC violation occurs or continues is a separate violation, and is subject to the maximum penalties allowable.

IF YOU HAVE ANY ADDITIONAL QUESTIONS ABOUT APPLICATIONS, PLEASE SEE "FAQs about the South Boston Parking Freeze" which is available at [www.cityofboston.gov/environment](http://www.cityofboston.gov/environment). OTHERWISE, CONTACT THE APCC AT (617) 635-2516 OR e-mail

[APCC@cityofboston.gov](mailto:APCC@cityofboston.gov) OR BY THE ADDRESS LISTED BELOW



## Appendix I: Sample Parking Freeze Permit



*Air Pollution Control Commission*  
**SOUTH BOSTON PARKING FREEZE PERMIT**  
APCC ID # 14.19a, 14.19b, 14.19c, 14.19d, 14.27a

Date of

Issuance: December 17, 2005

Issued to: The Gillette Company

Zone: Piers/ Industrial Zone

Facility: Binford Street and Necco Street (surface parking)

Spaces: 1,256 inventoried spaces;  
(399 remote spaces; 657 commercial/ employee/ tenant spaces)

See all attendant conditions.

This permit shall apply to the following five (5) parcels (listed by Parcel ID number):

0601167000, 0601167001, 0601167002, 0601168000, 0601164002.

The Boston Air Pollution Control Commission (the "APCC") issues this permit pursuant to the authority granted by Massachusetts General Law, Chapter 111, Section 31C, and in accordance with the APCC's "South Boston Parking Freeze Plan and Regulations," adopted pursuant to 310 CMR 7.33.

This facility must comply with the "South Boston Parking Freeze Plan and Regulations". The conditions listed below shall apply to the operation of this site, and the APCC reserves the right to add new conditions to ensure that this facility remains in compliance with the "South Boston Parking Freeze Plan and Regulations". The Commission, by vote, may revoke this permit for violation of any of these conditions or for any violation of the Commission's regulations.

---

Carl Spector, Executive Director  
Air Pollution Control Commission

*Air Pollution Control Commission*  
**SOUTH BOSTON PARKING FREEZE PERMIT**  
**APCC ID # 14.19a, 14.19b, 14.19c, 14.19d, 14.27a**

**Conditions:**

1. The Permittee shall comply with all applicable laws and regulations of the Commonwealth of Massachusetts, the City of Boston, and the Boston Air Pollution Control Commission. Copies of any permits or licenses required by any other entity to operate the facility shall be produced upon request.
2. A copy of this permit shall be placed at the main entrance to the parking facility or inside a booth, office, or other place that is readily accessible to the parking facility staff or person responsible for the operation of the facility.
3. The Permittee shall permanently affix and maintain a South Boston Parking Freeze Permit sign, provided by the APCC, in a prominent location near the main entrance to the facility, subject to approval by APCC staff.
4. The Permittee shall not exceed the maximum total of permitted parking spaces.
5. The Permittee commits to following APCC recommendations aimed at protecting the safety of patrons and pedestrians. These recommendations may concern such issues as: the "striping" of parking spaces on the property; providing adequate lighting, signage and staffing at the parking facility; etc.
6. Pursuant to the requirements of 310 CMR 7.33(7), the Air Pollution Control Commission shall require all parking facilities in the South Boston Piers Zone to set aside 20% of their total parking supply for Off-Peak use, and it shall not be available weekdays between 7:30 a.m. and 9:30 a.m.
7. Pursuant to the requirements of 310 CMR 7.33(7), lot owners and/ operators of parking facilities in the South Boston Piers Zone shall ensure the Off-Peak set-aside through the use of bollards and chains, gates, fencing or other means to physically block access to the Off-Peak spaces until after 9:30 a.m. on weekdays, or utilize a suitable electronic parking inventory control system to ensure the availability of the required Off-Peak spaces, subject to the approval of the BAPCC.
8. Inventoried Parking Freeze spaces are non-transferable. Pursuant to 310 CMR 7.33, Section III. D. (11): "The issuance of a Permit hereunder shall in no way be considered or construed to provide the owner, operator or tenant with any rights or approvals to use such parking spaces under any other laws, ordinance or regulation and shall not be construed to confer a 'property right.' " The Commission will only refuse renewal of a permit upon a finding of non-compliance or pursuant to an enforcement proceeding under Section III. J.

PAGE 2 OF 3

CITY OF BOSTON ENVIRONMENT DEPARTMENT, AIR POLLUTION CONTROL COMMISSION (APCC)  
One City Hall Plaza, Room 805 Boston, MA 02201  
[www.cityofboston.gov/environment/](http://www.cityofboston.gov/environment/) (617) 635-3850 [APCC@cityofboston.gov](mailto:APCC@cityofboston.gov)



*Air Pollution Control Commission*  
**SOUTH BOSTON PARKING FREEZE PERMIT**  
**APCC ID # 14.19a, 14.19b, 14.19c, 14.19d, 14.27a**

9. Pursuant to Section III. J. of the "South Boston Parking Freeze Plan and Regulations", any violation of the conditions associated with this permit may subject the Permittee to APCC violations and fines. Each day or part of a day that a facility is in violation of these conditions constitutes a separate violation.
10. This Permit is valid for one (1) calendar year from the date of issuance or until a Modified Permit has been issued – whichever event occurs sooner. The Permittee must file an application for a Renewal Parking Freeze Permit at least one (1) month prior to this Permit's expiration date.
11. Because the boundary of the Piers Zone bisects this parking facility, the 20% set-aside shall apply only to the parking spaces that are located within the Piers Zone. Based on the March 20, 2006 site plan submitted by the Permittee, the 406 spaces located in the Industrial/ Commercial Zone are not subject to the Off-Peak set aside. The Off-Peak set-aside shall apply only to the 850 spaces located within the Piers Zone. The Permittee shall ensure that 170 parking spaces set aside and unoccupied on weekdays between 7:30 a.m. and 9:30 a.m.
12. After the facility opens, the Permittee shall continue monitoring traffic impacts and take appropriate measures to mitigate traffic, including the installation of a traffic signal if and when the Boston Transportation Department (BTD) deems it necessary. All measures taken to mitigate traffic are subject to both BTD and APCC approval.
13. The Permittee may reallocate remote and commercial/employee/tenant parking spaces so long as the amount of remote parking never increases to more than 599 spaces, and commercial/employee/tenant spaces may be increased only in the amount that remote spaces are decreased. "Remote spaces" as contemplated by Section III.A. of the City of Boston's Parking Freeze Plan and Regulations shall mean any parking space which serves and uses outside of the South Boston Parking Freeze area. When a permanent reallocation between remote and commercial/employee/tenant parking spaces occurs, the Permittee shall provide written notice to the APCC prior to the renewal of this permit.
14. This permit contemplates that construction of a mixed-use development project, as approved by the City of Boston, will have begun on the property by 2012. If construction of a mixed-use development project has not substantially commenced by December 31, 2012, the Permittee shall return to a public hearing before the APCC to report and update the Commission as to the progress of the mixed-use development. At that time, the APCC reserves the right to reclaim Freeze Bank spaces allocated to the facility that will no longer be constructed as contemplated by this permit.

## **Appendix J: Permit Application Instructional Guide**

### **Instructional Guide City of Boston Air Pollution Control Commission Application Process for New Parking Freeze Permits**

This guide was created by the WPI South Boston Parking Freeze IQP team to outline the necessary requirements for issuance of new parking freeze permits. The Boston Air Pollution Control Commission (BAPCC) provides a document detailing the entire permit process, titled “Procedures and Criteria for Issuance of Parking Freeze Permits” which can be obtained via the BAPCC website. This document is intended to simplify the application process for new parking freeze permits in order to make it easier for the development of an electronic permit process. There are five major steps in the process: Application submission, Internal review, Notification, Hearing, and Decision. These steps are given in detail below.

#### **❖ Submission**

Applicants seeking to receive new permits must file a parking freeze permit application. Each submitted application must contain all the required information, while any application that is incomplete in any respect may be rejected. Each applicant must submit eight copies of the application: seven paper copies and one electronic copy. The seven paper copies will be in the following forms, one full size version and six sets on either 8.5x11, 8.5x14 or 11x17 forms. The permit applications shall be submitted to the Boston Air Pollution Control Commission (BAPCC) at the following address:

Boston City Hall  
BAPCC - Room 805  
Boston, MA 02201

Along with the permit application, the designated fees must be paid by check and made out to the City of Boston - Air Pollution Control Commission. Permits will not be issued until the proper application fees are paid. In addition to the application fees, the applicant is responsible for any costs acquired to advertise a notice of the hearing in a local publication. This requirement is explained in greater detail in the notification section.

## ❖ Internal

The BAPCC will inform and confer with the Boston Transportation Department (BTD) as new permit applications are submitted. Issues that may arise between the applicant and these two departments will be addressed prior to the hearing.

## ❖ Notification

The BAPCC is responsible for notifying the Regional Administrator of the Environmental Protection Agency (EPA) and the Commissioner of the Department of Environmental Protection (DEP) of the time and place of all hearings.

The BAPCC will provide the applicant with a Public Hearing Notice that must be published by the applicant in both a South Boston and Citywide newspaper of general circulation. As previously stated, the applicant is responsible for the cost of advertisement in these newspapers. The publication of this notice must be between twenty-eight (28) and thirty-five (35) days before the set hearing date. The notice will provide the following information: the time and location of the hearing, a brief description of the application, and state that a public copy of the application is available at Boston Environment Department, located in City Hall. The applicant must submit a copy of the notice, as it will be published, along with the date, page, and name(s) of the newspapers to the BAPCC prior to the hearing. The applicant must provide additional copies of the notice to the Office of Neighborhood Services and to each District City Councilor that currently represent any part of the South Boston Parking Freeze area. These additional copies must be submitted no less than ten (10) days before the hearing date.

The applicant is also responsible to make a reasonable effort to provide parcel abutters with a copy of the notice between twenty-one (21) and twenty-eight (28) days prior to the hearing. The applicant must provide evidence of these efforts to the Commission prior to the hearing date. Abutters include the owners of property that directly abuts the applicant's parking facility as well as the owners of property within three-hundred (300) feet from the property line of the parking facility.

## ❖ Hearing

Permit applications must be received no less than sixty (60) days prior to the next scheduled hearing to be considered, unless the BAPCC has granted written permission for an application to be filed late and the applicant is capable of meeting all of the notification requirements.

Seven (7) days prior to the hearing, the BAPCC will send each applicant that has submitted a complete application a joint staff report. This report will analyze the application, present transportation and planning facts and data which are relevant to the requirements for approval of a permit, and describe any further information required for the approval of the permit. Applicants who have filed incomplete or late applications will not receive the report at this time.

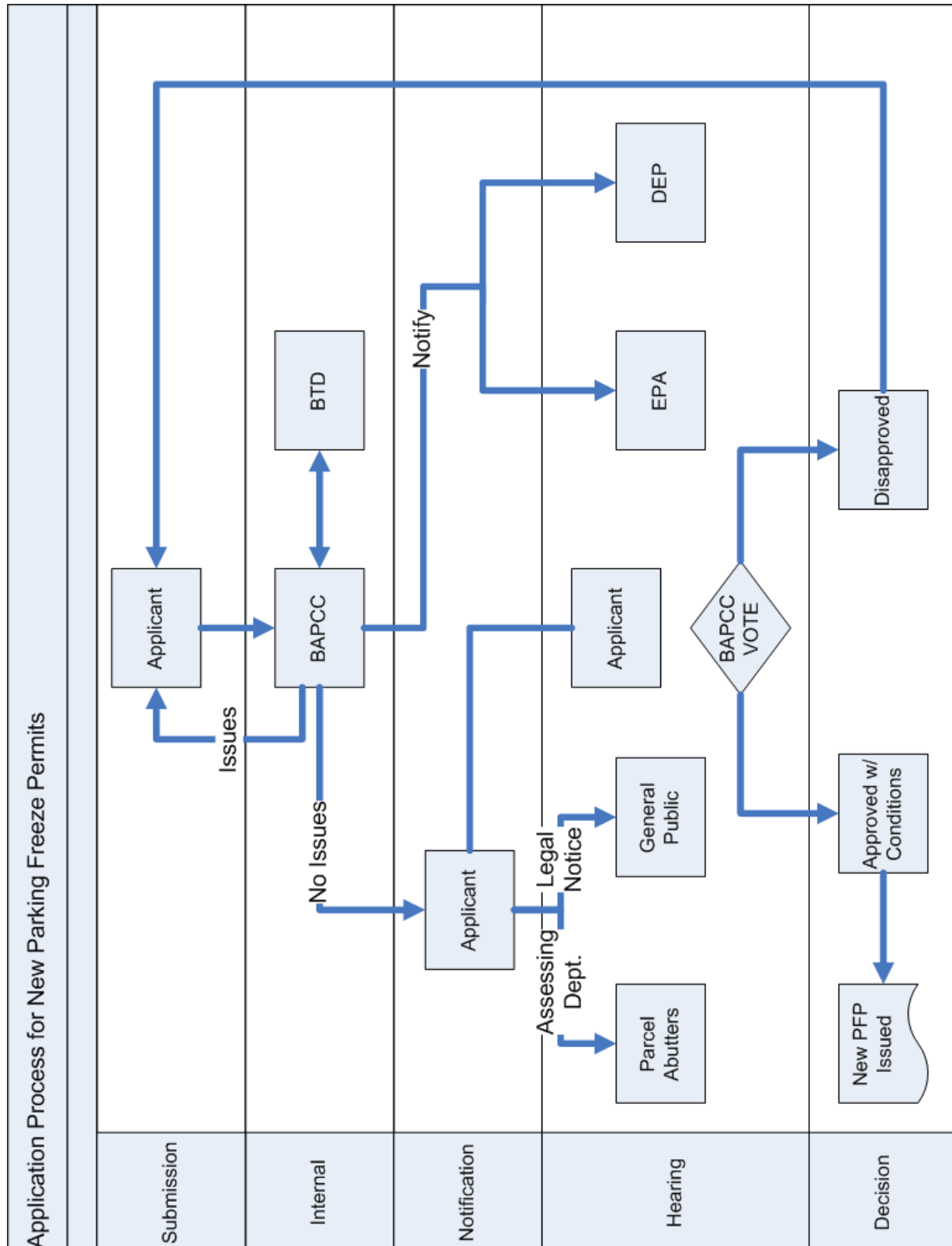
The BAPCC will hold hearings when it is deemed necessary. The Commission will keep a record of its proceedings and indicate member's votes for each matter voted upon. These

hearings will only be conducted by a majority of the members of the BAPCC that are currently in office. The BAPCC may continue a hearing pending additional information if it is agreed upon by a majority.

### ❖ **Decision**

Within twenty-one (21) days after the hearing, the BAPCC will approve or disapprove the permit application. The BAPCC's decision will be provided in writing and will show the location of the parking facility and individual spaces, the number of parking spaces allowed, and any conditions for the permit.

## Appendix K: Permit Information Flow Chart



# Appendix L: Electronic Permit Application

## CITY OF BOSTON ENVIRONMENT DEPARTMENT AIR POLLUTION CONTROL COMMISSION (APCC)

### NEW OR MODIFIED PARKING FREEZE PERMIT (PFP) APPLICATION

1. Parcel ID #:  (Assessing Department #)

Name, address of facility:	Name, address of owner:
<input type="text"/>	<input type="text"/>

Name, address of contact person:	Name and address of lessee, if any:
<input type="text"/>	<input type="text"/>

2. Attach written proof that applicant is owner of record or has written approval from the owner of record to file application. [See instructions.]

3. Type of Request:

- ☐ New Facility  
☐ Existing Facility

4.

Freeze Area	Total # of spaces	# of new spaces	# of existing spaces
Downtown	<input type="text"/>	<input type="text"/>	<input type="text"/>
South Boston	<input type="text"/>	<input type="text"/>	<input type="text"/>
East Boston	<input type="text"/>	<input type="text"/>	<input type="text"/>

5.

Type of Spaces	Commercial	Residential	Employee
Downtown	<input type="text"/>	<input type="text"/>	<input type="text"/>
South Boston	<input type="text"/>	<input type="text"/>	<input type="text"/>
East Boston	<input type="text"/>	<input type="text"/>	<input type="text"/>

6. Total square footage of property referred to in this application:  SF.

7. Gross square footage of all occupied buildings on the property, whether occupied for residential, commercial, retail, manufacturing, or any other purpose.

Purpose	Square Footage
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>
<input type="text"/>	<input type="text"/>

8. Attach a site plan or floor plan of the parking lot or garage, showing:

- ☐ Location of the facility;  
☐ Entry and Exit Point;  
☐ Layout of the spaces;  
☐ Total square footage of the parking area;

9. Provide ratio of proposed parking spaces to # of patrons. [see instructions]

Parking spaces for  employees;  residents;  other patrons

10. Indicate the proposed parking rate structure, if any:

- ☐  Per Hour  Per Day  Per Month.  
☐ these rates are in effect:  (days of the week).

11. Current parking method(s) in effect on the property (check all that apply):

- ☐ valet ☐ self-parking ☐ surface ☐ garage

12. List all supporting documents and/or appendices accompanying this application.


13. Check the following options if included in your facility.

- ☐ **Booth**  
 Describe the booth
- ☐ **Lighting**  
 Describe the Lighting
- ☐ **Parking for Zipcars**  
 Describe the parking for zipcars
- ☐ **Curbside Parking**  
 Describe the Curbside Parking
- ☐ **Fencing**  
 Describe the fencing

14. Please verify all the information you have supplied above and enclose a check or money order for the application fee (\$10 per parking space) with your application, made payable to the "City of Boston, Air Pollution Control Commission."  
If the application is in all respects an accurate and complete document and full payment is enclosed, then a hearing date and time shall immediately issue .

Application Fee:  spaces x \$10 = \$ .

Payment Submitted by: ☐ Check ☐ Money Order

I hereby attest that this document contains, in all respects,  
true, accurate and complete information.

Signed,

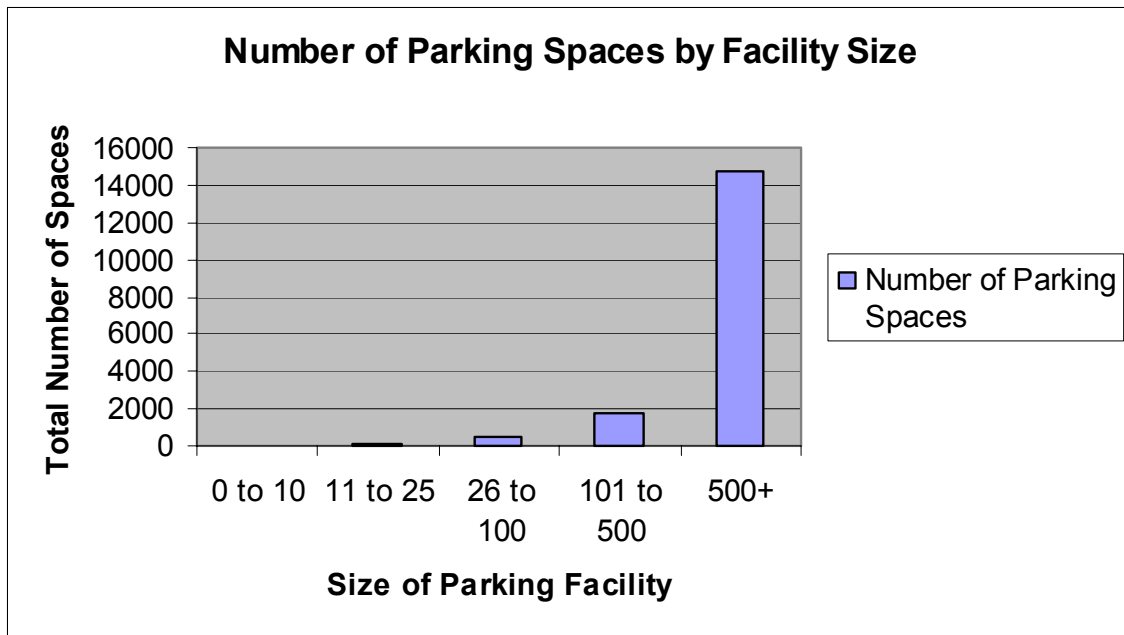
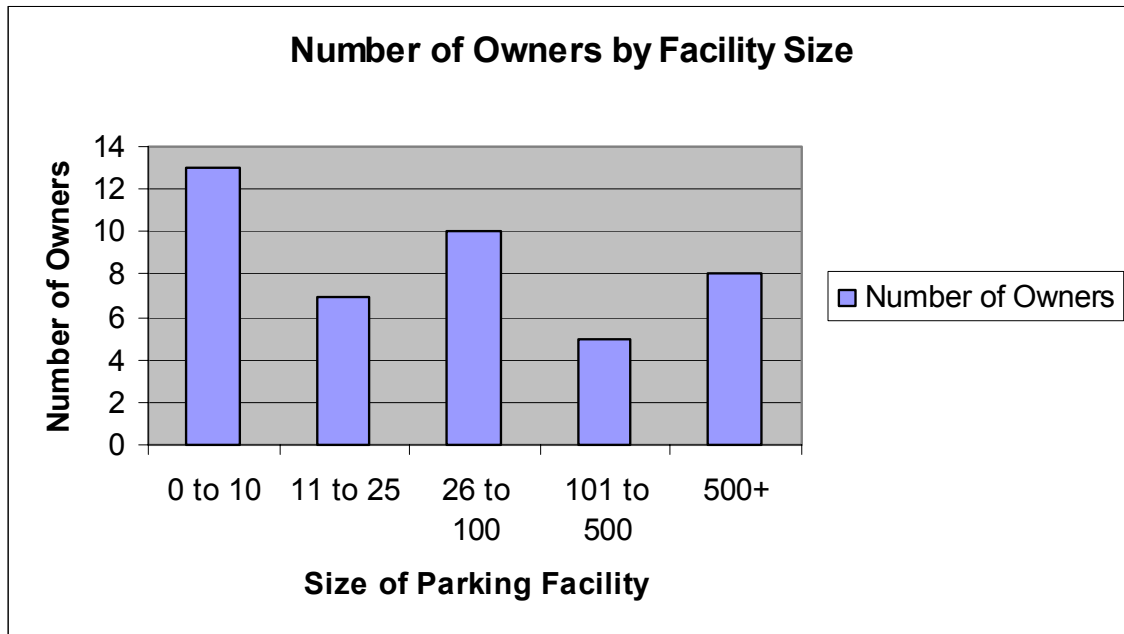
Date  

**APPENDIX A:**  
**STATEMENT OF NEED OF PROPOSED FACILITY**  
**[SEE # 10 OF INSTRUCTIONS FOR NEW OR MODIFIED PERMIT APPLICATION]**

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Submit

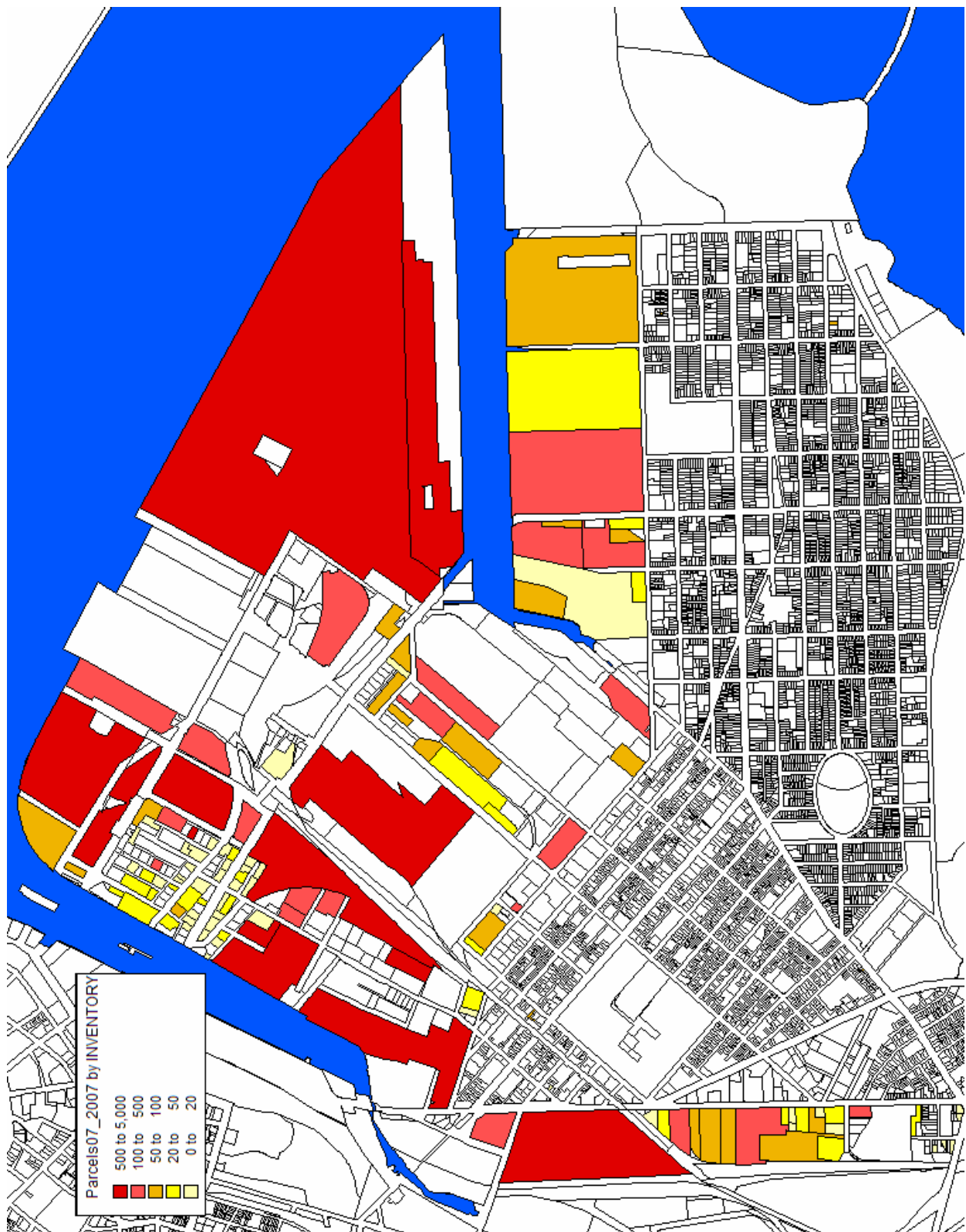
## Appendix M: Off-Peak Parking Ownership Graphs







## Appendix O: GIS Map by Facility Size



## Appendix P: GIS Map by Pricing

