The Parking Policy and Smart Growth Disconnect: Obstacles to Establishing and Implementing Smart Growth Parking Policy

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ABSTRACT

Urban areas are plagued by congestion, economic inequality, and inefficient land use that result from highway and single family housing subsidies, segregated land uses, and many other government policies established over the last 80 years. Parking is one part of the complex and problematic system of traditional urban development that can benefit from a Smart Growth approach to urban livability. Parking is increasingly understood to be an underlying factor in traffic generation that leads to increasing vehicle miles traveled, congestion, and several other nuisances that arise from a growing number of vehicles on the road. Furthermore, parking increases the cost of living in urban areas where parking demand is high and supply is tight.

Traditional growth patterns that encourage low density development with minimum free parking requirements exacerbate problems caused by parking. Smart Growth development counters traditional growth by offering mixed use development, maximum parking requirements, context sensitive design and focusing on increasing pedestrian and transit trips. After establishing the advantages of Smart Growth over traditional development for Boston, this thesis asks: why are the cities of Boston, Cambridge and Quincy not implementing Smart Growth when it could be better for everyone? Four case studies from the Boston Metropolitan Area (North Station, Ruggles, Quincy Center, and Alewife) will help identify the pros, cons, and constraints for shifting paradigms from traditional to Smart Growth policies. This thesis argues that developers' perception of buyer demand, lenders' perception of buyer demand, and communities' preference for lower density are the main obstacles to Smart Growth parking policies in the greater Boston metropolitan area.

Boston has many advantages in adopting Smart Growth: high density urban center, fairly well mixed land uses, reputation for being pedestrian friendly, as well as home to the sixth largest public transportation system in the country. The critical factors the city needs to change in order to implement Smart Growth include: disconnect between stakeholder perceptions of Smart Growth and the real estate market (stakeholders do not perceive themselves as 'winners' with Smart Growth), lack of affordable housing near transit, lack of enforcement for Smart Growth-oriented policies, increased transit capacity to handle future growth, and a more coordinated set of policies for housing, transportation, and economic growth that is centered around Smart Growth that a rigorously implemented and adhered to.

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This thesis is dedicated in loving memory to Joanne B. Seyfang

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CHAPTER 1: Overview and Objectives

Urban areas are plagued by congestion, economic inequality, and inefficient land use that result from highway and single family housing subsidies, segregated land uses, and many other government policies established over the last 80 years. These programs encourage auto use but hide the real cost of auto-dependency from the individual driver. Instead society bears the burden of auto-oriented development through taxes that subsidize auto-ownership, declining air quality, higher priced goods and services, higher real estate prices, and traffic congestion. A major shift in development theory is necessary to correct the multifaceted problems faced by American cities today. Smart Growth offers an alternative view of city development that focuses on mixed use areas, supports diverse communities and reduces auto dependency. Parking is one part of the complex and problematic system of traditional urban development that can benefit from a Smart Growth approach to urban livability.

While parking is rarely considered momentous news, it is emerging as a serious problem for American cities and towns. Parking is increasingly understood to be an underlying factor in traffic generation that leads to increasing vehicle miles traveled, congestion, and several other nuisances that arise from a growing number of vehicles on the road.[1] However, parking is often overlooked from a regulatory standpoint. Furthermore, parking increases the cost of living in urban areas where parking demand is high and supply is tight. Surface parking lots are an inefficient use of space and impose substantial esthetic costs by displacing green spaces; yet subsurface and above ground structured parking are extremely expensive to build. In most cities, zoning laws require certain amounts of off-street parking from developers. The developers regularly trade off density for

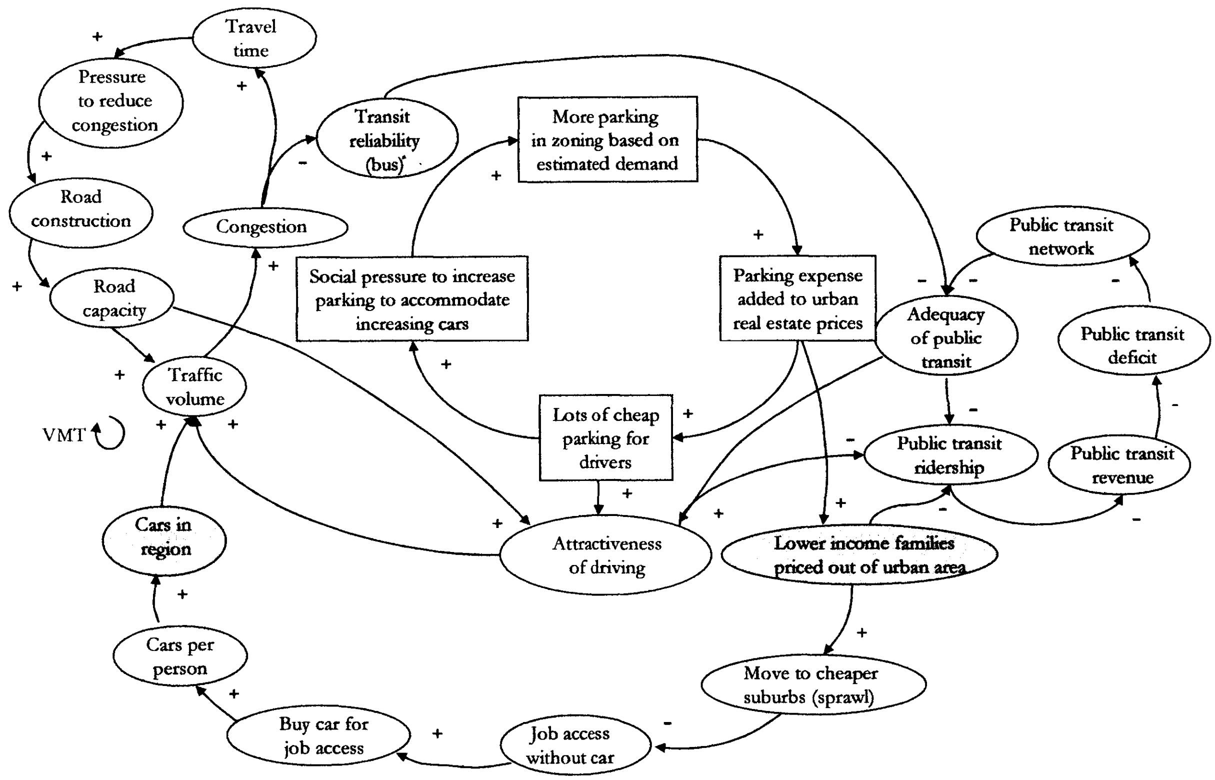
[1] There are certainly additional factors that contribute to increasing traffic and congestion, such as rising household incomes, cheaper technology, and available auto infrastructure.

parking spaces and pass the parking costs on to the home buyer through higher real estate prices (Shoup 1995, Kuzmyak 2003).

High residential real estate prices that are inflated by parking construction costs drive lower-income and young professionals away from living in urban areas where transit is located and a lifestyle independent of the auto is possible. Living in lower density suburbs forces them to purchase a car, which is expensive in itself, and perpetuates the cycle of increasing cars per licensed driver. In reality, the demographic most needing to live in an urban setting with public transportation are those with less income who cannot afford owning a car. The very population who needs the transit location most is priced out of the market, which is in part due to requiring unnecessarily high parking ratios for residential units. The cost of owning a car consumes a larger percentage of household income for vehicle-owning low income families than higher income families with cars (Public Policy Institute 2004). When these data are combined with information on housing and parking costs, the ability for middle and low income families to live in urban areas is severely challenged.

Figure 1.1 provides a simplified illustration of the relationships between parking, housing, road capacity and transit described above. The yellow rectangles in the center of the diagram represent the primary parking issues addressed in this thesis. The green ovals signify the impact on transit from traditional development and parking policies. The blue ovals illustrate the regional affect of high cost urban living and low density development. The tan ovals stand for the cycle of auto-oriented development that includes congestion, road capacity expansion, and rising traffic volume. The various loops are interconnected and impact each other in various ways. Action in the parking loop triggers a change in another loop, such as housing price increases, that positively reinforces the need for more parking as one follows the arrows throughout. The figure underscores the complexity transportation and urban planners have to deal with in coming up with effective solutions to problems caused and affected by traditional development. The figure is not comprehensive and could include environmental, job location, and other factors.

Figure 1.1 Feedback Loops of Traditional Development Parking Policy



Adapted from: Business Dynamics, by John D. Sterman

The following thesis highlights why Smart Growth makes more sense for Boston than traditional growth and identifies reasons why it is not being implemented. First, it will identify regulations for residential and commercial facilities that perpetuate the cycle of growing auto dependence, vehicle miles traveled and congestion, which are referred to as traditional growth policies. The logic behind traditional policies suggests that all activities require access by automobile; the density of the active areas should be low enough to avoid congestion; and parking should be proportional to the level of activity. The cycle is self perpetuating in that low density development cannot be well supported by transit and discourages walking and therefore encourages auto dependency.

The discussion will then turn to parking policy that attempts to better capture the value of public transit and density through context-sensitive design, or Smart Growth policy, and factors that serve as obstacles to such policy. Essential principles of Smart Growth include higher density, mixed land uses, diverse communities (income, ethnicity, and age), multiple mobility choices and protected open spaces. The "smart" logic behind these policies is that the amount of parking should be limited according to the street capacity or less to encourage transit and pedestrian access rather than limiting the amount of activity an area supports based on the density that can be sustained by auto access. Both policy types will be analyzed to see how it impacts urban development and accessibility choices for individuals. Obstacles to shifting from traditional to Smart Growth paradigms are investigated. The analysis will be done by focusing on four case study sites in the Boston Metropolitan Area that represent varying levels of density, and political will. The thesis will then conclude with recommendations for switching from traditional policies to Smart Growth policies in Boston.

Importance of the Research

American growth patterns since the development of zoning in the 1920 and even more so since World War II and the Federal-Aid Highway Act of 1956, have been of low density suburban sprawl and auto-oriented development that lead to greater vehicle miles traveled and air quality issues (Gordon 1991). The types of development that have occurred have been designed to accommodate the car – drive-thrus, narrow sidewalks, and parking lots in front of retail. Since the car is so much more convenient, Americans live in the suburbs rely on their car to run errands and commute to work. Ample free parking increases the convenience of driving and encourages even more auto trips. While it is a fundamental aspect of auto transportation, parking has largely been ignored as a major issue in nearly every urban and suburban center in the United States. Different approaches to the parking issue are a key part of any plan that attempts to reduce automobile trips and improve the livability of an urban area. As the number of cars per licensed driver increases and Americans become more dependent on automobiles, more parking is demanded and provided in cities and towns.

The finite aspect of road capacity, especially in older cities like Boston, cannot be expanded along with the parking supply. There is not enough road capacity to handle the increasing number single occupancy vehicles driving into the city and parking all day. As daily commuters drive into the city at peak times and search for parking, the roads fill up and become congested. Some cities attempt to combat congestion by increasing the road capacity and sacrificing the pedestrian environment. However, expanding the road and parking capacity is difficult when the most cost-effective options have been completed (Litman 2005). Other cities are looking for ways to increase transit ridership and walking rather than continuing to encourage auto-oriented communities.

The cyclical pattern of congestion, parking supply, rising real estate costs, and suburban sprawl is detrimental to the health of urban areas throughout the United States (see Figure 1.1). The Smart Growth/New Urbanism movement, which has been gaining momentum over the last two decades, breaks the cycle and creates communities that are more "livable." Development according to Smart Growth is pedestrian-oriented and reduces auto-oriented features such as front parking lots and wide boulevards. Smart Growth development with reduced parking requirements allows developers to build at higher densities since they have more land available to provide livable space rather than parking spots. The higher density is also more conducive to frequent convenient transit service. However, implementation of Smart Growth development relies heavily on urban and transportation planners, acceptance by communities, and the developers' and financial institutions' willingness to take the risk and adapt development to a new paradigm (TCRP 1999, Shoup 1995).

Coordination between urban and transportation planners is critical to addressing development and parking problems in most cities. Urban planners need to be concerned with parking supply issues given their responsibilities to attract businesses and residents to the city and formulate a master plan for the city's long-term development.[2] Transportation planners' concerns regarding parking includes increasing vehicle miles traveled, decreasing level of service on roadways, declining transit ridership, and rising transportation costs for individuals and the city. Working together, urban and transportation planners can identify policies that improve land use and mobility, while maintaining economic development and providing the opportunity for diverse groups to live and work within the city.

Thesis Question & Objectives

Many of the nation's urban transportation, housing and economic development problems are the result of a series of pro-automobile policies established in the mid-twentieth century. The best way to address these problems is to shift from those traditional development policies to an approach that is more context-sensitive to the urban environment and encourages more diverse development: Smart Growth. Smart Growth policies reduce single occupancy vehicle trips while encouraging economic growth and development through more efficient use of public transportation and higher densities. After establishing the advantages of Smart Growth over traditional development for Boston, this thesis asks: why are the cities of Boston, Cambridge and Quincy not implementing Smart Growth when it could be better for everyone? The perception of buyer

[2] Urban planners have historically paid little attention or through to off-street parking despite the fact that it has "fundamentally shaped our environment." (Gómez-Ibáñez 2005)

demand by developers and lenders, and communities' preference for lower density are the main obstacles to Smart Growth parking policies.

Smart Growth parking policies lower parking ratios to better reflect local characteristics, such as road capacity, access to non-auto modes of transportation, and job and housing density. The policies reduce auto-dependency by limiting parking where alternative transportation is available, placing more parking where transit access is not available, and reducing employer subsidized parking programs. Smart Growth parking policies are complemented by its housing and land use policies that encourage affordable housing near transit, mixed use development, and pedestrian-friendly street design.

Boston area developers are reluctant to embrace Smart Growth parking restrictions because they believe that residential home buyers and lenders demand off-street residential parking. Their perception is based on the profits they make from providing structured parking for high-end residential units. If the residential home buyer market did not demand off-street parking, developers would not be able to recover the construction costs and would not provide the spaces. But the demand pull for parking in Boston drives up the willingness to pay for spaces and justifies developers providing more than adequate parking given the transit accessibility of most neighborhoods in the city. In addition, lenders that provide financial backing for the developers have an interest in maximizing investment returns and use their perception of parking demand to influence how much parking is provided by the developer. Developers also argue that, even if home buyers were willing to accept less parking, they are limited by zoning regulations. However, Kuzmyak noted several occasions where developers that were offered relief from parking requirements did not take advantage of them, (2003, pages 18-11, 18-32).

Commercial lenders are reluctant to embrace Smart Growth parking policies because they also profit from the traditional parking regulations and do not perceive the buyers shifting away from off-street parking demands. Lenders determine whether to finance a developer based on a set of established criteria and market assessments that include parking availability (Gilchrest 2005). Some lenders require parking ratios to be comparable to other buildings competing in the same market (Kuzmyak 2003). Since lenders are profit driven and residential projects that include off-street parking recover the expense of parking construction, there is little incentive for lenders to risk funding projects that adopt Smart Growth parking.

Residential communities are reluctant to accept Smart Growth parking policies because they perceive lower parking ratios and increasing density as a threat to the community life they enjoy. They are protective of parking and often demand at least one space per unit for new developments with ownership options (Gilchrest 2005, Preston 2005). Some residents argue that increasing density without adding parking availability increases congestion in their neighborhoods and reduces the value of their property. Of course, the desires of the residents are dependent on the neighborhood in question; some neighborhoods are more willing to accept lower parking ratios than others. But frequently, two points of view are voiced in many communities: opposition to increased competition for scarce parking spaces and opposition to increasing traffic and density in general (Edmondson 2005, Preston 2005).

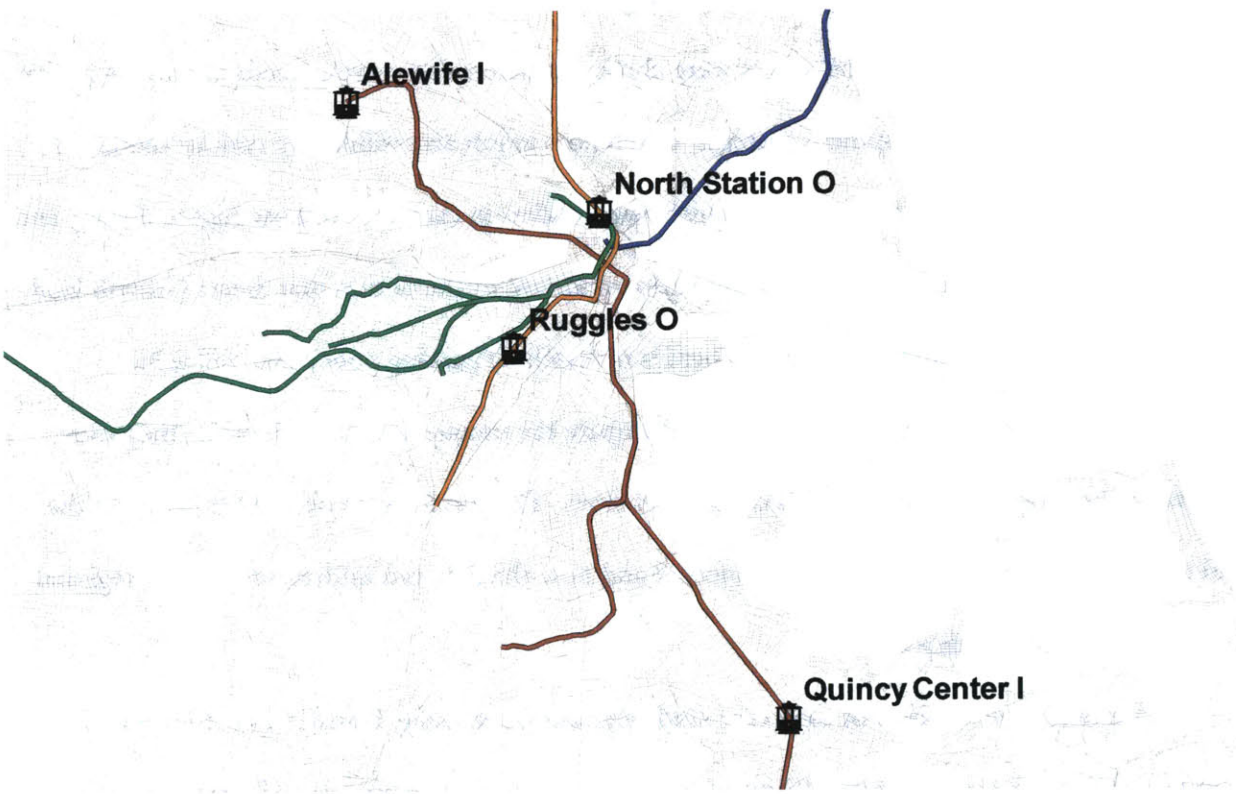
Methodology

Several research methods were employed to identify how Smart Growth benefits the greater Boston metropolitan area, the extent to which developers, lenders and communities block the use of parking as a tool to reduce vehicle miles traveled, auto-dependency, and residential housing prices, and the extent to which each influences parking policies. I reviewed various definitions of Smart Growth and traditional parking policies that will serve as a base for this discussion. I also sought to identify obstacles and opportunities for each type of policy to obtain the objectives of less congestion and lower residential real estate prices. Some of the literature identified coordinating land use policies and pricing schemes that are considered important to the set of tools for achieving Smart Growth and transit-oriented development. The literature review was also done to identify the extent to which communities' and lenders' influence on parking policy has been studied.

In order to analyze the parking policy situation in the greater Boston metropolitan area, four case study sites were selected: North Station and Ruggles in Boston, Quincy Center south of Boston, and Alewife, which is north of Boston in Cambridge (see Figure 1.2). Each site is a subway station with bus stops; all except Alewife have a commuter rail stop. The density for each area varies, with North Station being the densest and Alewife being the least dense. Sites with different densities and considerable public transportation access were chosen to determine varying needs in parking policy based on land use and development patterns, differences in job accessibility by various modes of transportation, and identify the extent to which stakeholders in each area oppose higher density and lower parking ratios. These differences were also important to the notion that Smart Growth land use policies should be context sensitive. There is no catch-all parking policy that will achieve regional reduction in congestion. Rather than compare the unique sites to each other, they were analyzed separately using the methods described below. The results were brought together at the end to determine how they were interconnected and how the data can inform and impact regional transportation and parking policy.

A quantitative analysis of each case study site was done using TransCAD software and census and Central Transportation Planning Staff (CTPS) data. The purpose of this analysis was to identify changes to job accessibility by location and mode. The current parking supply, job and residential density, travel times, and mode split were identified for each site. Job accessibility within 30 minutes from the station was measured for pedestrian, public transit and private automobile modes. The housing supply within a 30 minute transit commute to North Station was identified and compared to the housing supply within a 30 minute drive to North Station to determine the percent of transit accessible housing. Available estimates of origin and destination information were used to determine the current mode split for each case study site. Housing cost data was also gathered and analyzed for areas containing or in close proximity to the case study stations. The average selling price for homes with off-street parking were compared to the average selling price for homes without off-street parking to provide a rough estimate of how much parking adds to the price of residential ownership across the greater Boston metropolitan area.

Figure 1.2 Map of Case Study Stations



Public hearing transcripts for zoning appeals related to parking ratios were reviewed to determine community preference and influence in each city. Cases for Boston, Cambridge and Quincy were analyzed for the type of parking change requested (increase or decrease in the amount of parking required), whether the request was granted, who opposed the requested changes, who supported them, and the basis for the decision when available. Zoning appeals were not reviewed for each case study site due to difficulty in obtaining such information given the filing and record keeping methods of the cities.[3] This qualitative data was used to determine whether the communities in each area had an influence on holding down density and maintaining current parking ratios. For each zoning appeal reviewed, participation of the community and its position was noted, as well as the final decision by the board of appeals. The impact of each stakeholder group was also measured qualitatively through a series of interviews with planners, developers, lenders, and community leaders. The interviewees were chosen based on knowledge of their position in the Boston development and planning community and accessibility during the research period. The objectives for each interview are listed in Appendix D, along with the specific interview questions for the stakeholders. Additional questions were asked as the discussions led to different areas of relevance to the thesis question at hand. A full description of the methodologies used is in Appendix A.

The following chapter delves into the problems caused by parking and how these are shaped by traditional growth development. Chapter 3 establishes the definition of Smart Growth development and parking policy and identifies its advantages over traditional growth. Chapters 5 and 6 discuss the research results for the case sites and the greater Boston metropolitan. Finally, Chapter 6 concludes with a summary of the findings and analysis and suggests policy options to remedy the parking issue.

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[3] Boston and Quincy file their zoning appeals records by specific address, not by the type of appeal being sought, which makes searching through the files difficult and time consuming. In order to obtain sufficient parking appeals information in the limited time for research, the geographic location of the review had to be expanded.

CHAPTER 2: TRADITIONAL GROWTH POLICIES & ASSOCIATED PARKING PROBLEMS

Traditional urban development is the only type of development that more than a generation of Americans has ever known. Since the public and the planning profession are comfortable and familiar with traditional development, it is more difficult to blame it with the urban problems experienced today. However, the government policies and programs that support auto-oriented growth and sprawl synonymous with traditional growth have resulted in major problems with housing, land use and transportation in American cities. The following chapter outlines the history of traditional growth, the motivations for this type of development and the parking problems associated with it.

The type of development referred to by the term traditional growth in this thesis is that which was informed by the earliest zoning initiated in New York City in 1916,[4] followed by the introduction of zoning codes in 552 other cities by 1927[5] and the development pattern that occurred after World War II, namely suburban sprawl. The original zoning codes established a separation of uses intended to protect people from the aggravations of industry and manufacturing. Later, they were tools for exclusion as single family home owners sought to limit the proximity of multiple family dwellings and other "undesirable" land uses (Babcock 1966, Wickersham 2001). As the zoning codes were updated, they established development patterns at densities too low to support transit systems (TCRP 1999). The codes ignored the external factors that benefit from density and transit, such as affordable mobility and the social network created by living in pedestrian-oriented neighborhoods, reducing the need for both. Hence, the establishment of auto-oriented development began prior to the period when automobiles were available to the majority of the

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[4] The 1916 zoning established controls for building height and setbacks, and separated uses that were incompatible with residential living (NYC Dept of City Planning)

[5] Statistics on the number of cities with zoning codes from Greenstreet 1996.

population. Since the lower density suburbs were primarily only accessible by car, the automobile simultaneously became a factor in class separation and a status symbol that all workers aspired to own (Gordon 1991).

The Depression and World War II interrupted these movements for a short time as the government imposed rationing of gasoline, tires and other goods, and Americans altered their lifestyles to fit the faltering economy and war effort. Suburban sprawl primarily came as a reaction to these times of limited growth and personal freedom. Americans rebelled against crowding in urban areas, the need to use public transit, disengagement from nature and limits to their mobility, seeking more personal space and privacy. As the United States came out of World War II, domestic petroleum production increased, the auto manufacturing sector took off and the interstate highway system was starting to be built – all of which supported development that focused on car travel.[6]

The period immediately following the war was also marked by government support for suburbanization (Pucher and Lefevre 1996, Dittmar and Ohland 2004). The Federal Housing Act made it easier for families to obtain home loans and additional income tax deductions provided American families with more disposable income for single family homes and a car in the driveway. These government actions were an effort to prevent a relapse of the depression and bolster the economy. However, the long term impacts of such auto-oriented and pro-sprawl policies go beyond national economic stability (Shoup 1995, Goldberg 1999). As jobs and commercial businesses followed the housing boom and cheaper land in the suburbs, auto-ownership became more critical to participation in the growing economic and social life offered by sprawling metropolitan areas. Table 2.1 illustrates the innate need for car ownership in order to live outside of the central city. Overall, the auto-oriented and pro-sprawl policies have come to ingrain a lifestyle that is increasingly

[6] It is interesting to note that European zoning, especially in Germany, post WWII focused less on separation of uses and sought to bring open space and agricultural land uses into the cities. (Pucher and Lefevre 1996)

auto-dependent and difficult to change given the infrastructure and political network that has been established over the last 80 years.

Table 2.1 Vehicles Per Household* by Type of Area: 2000 Census Data

Type of Area	Vehicles Owned Per Household
Suburban	2.0
Central City, not downtown	1.8
Central Business District	1.6
Areas within 1/3 mile of LRT station & >10 miles from CBD	1.9 – 2.0
Areas within 1/3 mile of LRT station & <10 miles from CBD	1.6 – 1.8

*Single and multiple family households under ownership; refers to Portland, OR region
Source: ITE *Parking Generation* (McCourt 2004)

In addition to the influences toward auto-dependency caused by government incentives for sprawl, rising vehicle ownership and vehicle miles traveled are attributable to a unique period in U.S. history. The maturation of the baby boom generation created a spike in the demographics eligible for drivers' licenses. The rising number of women entering the workforce also increased the number of people driving. The affordability of cars provided the opportunity for a greater number of eligible drivers to own vehicles. During this time, vehicle ownership per capita grew three times faster than the population of the U.S.[7] (see Table 2.2) (Litman 2005, Lave 1990). Without government regulation to control the "concrete commons,"[8] free and unlimited access leads to a decline in the quality of the road infrastructure via chronic congestion, poor road conditions, and decreased safety. American auto-dependency is playing out Hardin's *Tragedy of the Commons* on its roads and highways (1968).

Table 2.2 Vehicles Ownership per Household* (%): Census Data from 1960 to 2000

Year	No Vehicle	One Vehicle	Two Vehicles	Three or More
1960	21	57	19	3
1970	17	48	29	6
1980	13	36	34	17
1990	12	34	37	17
2000	9	34	39	18

*Single and multiple family households under ownership; refers to Portland, OR region; data beyond 2000 not included.
Source: ITE *Parking Generation* (McCourt 2004)

[7] However, vehicle ownership per capita peaked in 2000 and has declined slightly since (Litman 2005).
[8] Concrete commons refers to road, highway, and other concrete infrastructure for auto use (Salvucci 2005)

Traditional growth as supported by the above events and factors is characterized by a separation of uses in a hierarchy that protects single family residential areas from other uses that may become a nuisance to families living there. The objectives of traditional growth and suburbanization are to:

- Separate undesirable land uses (industry, manufacturing, municipal waste services) from desirable (single family homes);
- Base land use on ratios rather than infrastructure capacity for density limits and parking requirements
    - partly in effort to provide adequate room for anticipated growth in post war era
    - based on the number of automobiles needed in direct proportion to the number of households in residential areas, jobs in employment centers and commercial space
- Achieve of the American Dream (own home with automobile and a yard) (Gordon 1991)
- Provide socially exclusionary zoning that separate poor people from middle and upper class neighborhoods and school districts (Wickersham 2001, Danielson 1976, 2) – "[A]partments have been kept out of areas dominated by single family homes….City governments have used their control over the location of subsidized housing to exclude lower-income groups from more affluent areas." Of course, even more fundamental is the inability to live in a suburban apartment without owning an automobile.
- Provide political independence and control over taxes and education; "People sought suburbanization for essentially private purposes, revolving around better living conditions. The same people sought suburbs with independent local governments of their own for essentially public reasons, namely the ability to maintain these conditions by joining with like-minded neighbors to preserve those lifestyles which they sought in suburbanization." Daniel J. Elazar (Danielson 1976, page 29); for instance, suburban control over school finance supported by taxes allows the best school systems to ensure high standards and opportunities for the future, whereas urban schools with more scarce tax support have in general a lower quality education to offer, reinforcing the desire for families to locate in the suburbs for better education opportunities

The basic policies for traditional growth include zoning codes that separate land uses, building codes that restrict the size and façade of buildings, density levels to accommodate auto access, parking requirements based on physical space of a business or residential unit, other street design regulations that enhance automobile use and protection of open spaces to preserve low density land uses. These policies result in a perpetual cycle of similar growth that relies on the automobile for access and opportunity. Since parking spaces, especially surface spaces, take up land that could be used as livable space, high parking ratios work to reduce the allowable density in an area. Some researchers have indicated that higher parking ratios may be a tool for maintaining lower density and used as a form of exclusion (Babcock 1966, Danielson 1976). As mentioned previously, lower densities discourage transit use and contribute to the dominance of auto travel.

Transit systems and stations in the post-WWII period and up through the 1990s were also built for auto convenience. Many "[were designed] explicitly to work with the automobile, with the assumption that most people would drive to suburban stations rather than walking, biking or riding a feeder-bus system." (Belzer and Autler 2002, 5) The stations were surrounded by large parking lots, serving a regional objective, rather than nestled in a local community with pedestrian connections and local flavor (Belzer and Autler). The resulting development was transit-adjacent rather than transit-oriented. While transit-adjacent development takes advantage of its proximity to transit as a market value, the community may not behave in a transit-oriented way (i.e. fewer cars per household and less vehicle miles traveled).

In sum, traditional growth objectives have led to communities divided by income levels, require car access to interact socially and economically and severely limit the viability of public transportation by encouraging low density development. Traditional growth policies have used parking as a tool to keep density down, increase housing pricings and perpetuate auto dependency. The seriousness of the problems associated with parking are evident in the attention it has received in recent transportation professional conferences, news and journal articles written over the last five years and new reports released from prominent transportation foundations. At the 2005 annual Transportation Research Board conference in Washington DC, parking was repeatedly sited as an obstacle to resolving congestion, reducing vehicle trips and achieving more sustainable development, often in sessions not directly related to parking. The Institute of Transportation Engineers, the Eno Foundation and the Transportation Research Board (TRB) have all announced forthcoming reports on parking issues. The following section outlines the basic problems with traditional growth parking policies.

The Problems

Traditional growth has established a real estate market that perpetuates auto-dependency, creates a demand pull for residential parking and cost push that forces low income households out of transit rich areas. The excessive amount of required parking and lack of pricing on the non-residential parking supply has led to low density development, increased congestion, air quality problems and issues of social exclusion. The parking problems associated with traditional growth can be organized by areas of impact: transportation flows (tension between parking demand and supply), land use and development patterns, social costs of the parking supply, real estate costs of the parking supply and environmental concerns.

Parking Supply & Demand & Transportation Flows

The importance of determining how much parking to provide is often underestimated given its impact on many aspects of the transportation system and mode choice. Primarily, required excessive and free parking encourages driving, increases vehicle miles traveled and establishes dispersed development patterns that are difficult to serve with public transportation. The price of parking influences mode choice more than supply alone as free parking hides the market cost of parking and encourages single-occupancy vehicle trips, which are a primary cause of congestion during peak hours (Feigon et al 2003, Shoup 1995). The pedestrian environment is degraded by expansive paved parking lots that often stand between the sidewalk and front door of various shops and offices (TCRP 1999, Belzer and Autler 2002). On the other hand, a parking supply that is too small can have adverse impacts on traffic flows as well. Drivers must circulate more in a neighborhood or parking lot to search out a space, which increases vehicle miles traveled for the individual and congestion on local streets (Kuzmyak 2003, McCourt 2004).

The seemingly simple solution of optimizing the parking supply turns out not to be straightforward or easy. Several research projects have shown that cities typically require more parking than the estimated demand for it, ranging from 15% to 114% in excess (Shoup 1995, Kuzmyak 2003). However, neighborhoods, business owners, and other groups constantly clamor for additional parking, saying the demand is not being met. Under the traditional growth paradigm, urban planners frequently use Institute of Transportation Engineers (ITE) survey results as guidelines for establishing their own parking requirements as well as observations of the number of cars parked at existing buildings. Parking supplies are also based largely on estimated parking demand. As repeatedly articulated in ITE's *Parking Generation* report, estimating parking demand is very difficult. Numerous variables must be taken into account and each land use is estimated separately based on cases submitted to the ITE from around the U.S. and Canada. The differences in parking demand between residential and office alone is highly complex. In addition, the appropriate statistical tools that estimate demand for one land use may not be appropriate for another. The location of the land use (central business district, suburb) also plays a role in estimating the demand for parking, further contributing to the complexity of the process.

Including price in parking demand estimates further contorts the practice determining parking supply. According to the Parking Consultants Council, the parking supply is best set at 10 to 15% greater than the estimated demand for parking because parking systems are believed to be most efficient when they are only at 85 to 95% of capacity (which reduces the amount of circulating a driver must do to find an open space) (Shoup 1995). However, Shoup articulates that since demand estimates are based on free parking and do not account for the impacts of pricing, the demand estimates are already too high. Adding 10-15% more parking to the supply than estimated demand is excessive. Traditional growth methods in setting parking supply do not account for urban density, road capacity or transit access and capacity and have considerable uncertainty. The consequence being "... a vicious cycle of parking subsidy, required oversupply of parking and ubiquitous free parking, which then leads to an observed "demand" that is used to set future minimum parking standards." (Shoup pg 19). Until there are more detailed reports on parking demand estimates that include pricing, planners have to rely on local knowledge and observed demand in setting the parking supply.

Part of the problem with determining the right amount of parking to keep transportation flowing is the vocal demand for parking from businesses and communities. There is a certain perception of right and success associated with parking provisions and a lack of concern for the costs imposed on others for the resulting congestion problems. Business owners perceive a distinct need for customer parking, especially if public transit is unreliable, and 80% of employers provide their employees with some type of parking benefit (Kuzmyak 2003, Begelfer 2005). Any attempt to reduce parking is seen as an assault on the economic health of the business. Surveys of residential home owners revealed unwillingness to give up parking spaces. Additionally, to some degree urban dwellers expect to have the same amount of parking available as provided by suburban land uses (Stubbs 2002, Gilchrest 2005).

Land Use, Development Patterns & Zoning Ordinances on Parking

"*Minimum parking requirements in zoning ordinances are like fertility drugs for cars.*" (Shoup 1995, 20)

Zoning plays a major role by determining land use and development patterns that influence where and how people choose to live. Traditional zoning ordinances are auto-oriented and establish low density land uses that require parking based on the need to access activities by car. Decades of development with this type of zoning has established auto-dependent behavior and development patterns that rely on parking availability.

Despite the importance and impact of parking on transportation flows and urban form, parking ratios are often not based on local situations and information. Typically, zoning requirements for parking are based on ITE reports and generic building types that do not relate to adjacent land uses and road capacity of the specific area (Shoup 1995, 2002). The ITE states these ratios are not meant to be used as a recommendation or set of standards, though it is believed that many municipalities use them as such (Shoup 2002, McCourt 2004). Most traditional zoning ordinances establish parking ratios related to the square footage of the building or number of residential units and institute a minimum amount of parking to be provided. As the number of off-street parking spaces increases due to developers supplying the minimum or more, which is usually set too high, the density of cars in the area also rises. More cars result in greater traffic congestion due to the limited capacity of the street network. The quality of the pedestrian environment declines and public transportation operating on the congested street loses ridership from delays (Kuzmyak 2003). In other words, "minimum parking requirements are an addiction masquerading as a cure" – additional parking does not reduce congestion or improve the urban environment, it only makes them worse (Shoup 1995, 20).

Auto-oriented development patterns and land uses support continued development of the same type. Land uses that are not well served by the automobile are phased out as auto-dependency increases and the market for non-auto economies declines. The drive-thru has replaced pedestrian oriented shops and businesses. It is a downward spiral that is difficult to stop, especially when the zoning ordinances are written for the separated single uses that perpetuate it.

Social Costs of the Parking Supply

Since traditional off-street parking regulations and zoning codes favor large lots and result in low density development patterns, public transportation systems do not efficiently serve these areas and cannot compete with the auto in terms of time and accessibility (TCRP 1999). Living in a low density area requires owning a car in order to access jobs and basic services. Low and middle income families often struggle with the added auto ownership and parking costs and are forced to reduce the amount of discretionary income spent on housing, food, and education (see Table 2.3). Low income families that own a car spend a larger percent of their household income on transportation than higher income families with cars (Public Policy Institute 2004). In addition, Massachusetts is ranked third among states with the most expensive auto insurance, making it even more costly to own a vehicle in Boston (hence the estimates in Table 2.3 may be low for Massachusetts) (Insurance 2005). Those families unable to afford a car may find themselves isolated from available jobs if there is inadequate public transportation near home and work, especially as the imbalance between job and housing location grows due to single-use zoning codes (TCRP 1999). On the other hand, the percent of income per household spent on transportation is lower for those living in transit accessible areas as compared to those in auto-oriented areas (Belzer and Autler 2002). However, while transportation costs may be more manageable in urban areas, low income households living there spend a larger portion of income on housing than high income families (Ingram 1998) (see Table 2.4). Essentially, low income households are pinched between spending more on housing costs near transit made higher by parking requirements and high auto-ownership and parking costs where housing is cheaper. It is not unreasonable to conclude that higher parking requirements exclude some middle and lower income families from settling in urban areas with transit by making the housing stock too expensive. Requiring less parking per residential unit can significantly lower housing prices, which may also make lower and middle income families more eligible for better mortgage rates through programs such as location efficient mortgages[9] (Belzer and Autler 2002).

Table 2.3 Annual Car Ownership Cost Estimates Excluding Parking*

Year	Cost per Year	Cost per Mile
2005	$8,410	56.1 cents
2004	$8,431	56.2 cents
2003	$7,754	51.7 cents
2002	$7,533	50.2 cents
2001	$7,654	51.0 cents
2000	$7,363	49.1 cents

Source: Fairclough. * The estimates are based on 2005 subcompact cars and account for vehicle depreciation, insurance, fuel, tires, license, registration and taxes, vehicle financing, routine maintenance and repair, not environmental costs.

Table 2.4 Median Annual Transportation Expenditures*

	Low-Income Households		**All Other Households**	
	Dollar Amount	% of Household Budget	Dollar Amount	% of Household Budget
Transportation expenditures for all households	$2,164	13	$6,569	15
Public transit expenditures for transit users	$360	2	$434	1
Private vehicle expenditures for vehicle users	$3,586	19	$7,144	16

* For California Households – the data is based on California statistics. Table adapted from Public Policy Institute 2004

9 Location efficient mortgages (LEM) programs improve mortgage eligibility for families located near transit systems that agree to own one less car or no cars. The logic is that a family will be better able to meet the mortgage requirements without the financial burden of owning excess automobiles. LEMs are available in Chicago, Seattle, Los Angeles, and San Francisco. The mortgages are underwritten by Fannie Mae. (Belzer and Autler 2002) See also Koffman 2003.

The impact of high parking requirements is not limited to home buyers. Since parking is usually free to drivers, the community ends up paying in terms of higher prices for goods and services (generated by higher cost of development), greater congestion, air pollution, expensive road capacity expansion, loss of drainage capacity and polluted runoff. Free parking is an excellent example of the "tragedy of the concrete commons." (Salvucci 2005) Without proper market pricing of public and commuter parking, more people will choose to drive and park, congesting the limited street capacity. The individual motorist does not consider the other drivers and their need for road space or parking. Rather, everyone drives to benefit themselves, demand for parking goes up, the road and parking supply increases in effort to reduce the congestion and the cycle continues as more choose to drive given the ample "free" parking (Shoup 2002). At some point the road and parking capacity reaches a limit, congestion becomes severe and everyone in the community suffers. Lower parking requirements save money for both the individual and community (Belzer and Autler 2002, Shoup 1995 & 2002).

Real Estate Costs of the Parking Supply

> "*Form no longer follows function, fashion or even finance; instead, form follows parking requirements.*"
> (Shoup 1995, 25)

Since parking adds significantly to the construction costs, it adds to the selling price or monthly rent for houses and condominiums. Table 2.5 provides construction costs per space for various types of parking. The estimates listed in the table are national averages and are considered low for the Boston area according to developer Byron Gilchrest (2005). Developers typically tack at least the price of providing parking onto the price of the housing unit. If the market value of the unit with parking is higher than the cost, the developer has the incentive to provide the parking space. While most developers will consider transit accessibility and capacity in making decisions, the most important criteria in considering the amount of parking to provide is the marketability of the project (i.e. competitiveness, financing options, return on investment) (Kuzmyak 2003, Gilchrest 2005, Nichols 2005). Table 2.6 shows that developers are the most likely winners in several market scenarios for reduced parking, with the exception being when there is little land for development and vacancy rates are high. Of course, this table does not compare the developers' financial benefits from providing normal parking supplies to those experienced from reduced parking, which is a major factor in deciding which to pursue.

Table 2.5 Construction Costs of Parking

Range	**Surface**	**Above-Ground Structured**	**Subsurface Structured**
Lower Limit	$1,000	$8,000	$20,000
Upper Limit	$3,000	$15,000	$35,000*

* May be a low estimate for Boston market as one source cited as $40,000-50,000 per space (Gilchrest)
Source: ITE *Parking Generation* (McCourt 2004)

Table 2.6 Determination of Benefits from Reduced Parking Requirements

	Benefits of Reduced Parking to:		
Market Conditions	**Land Owner**	**Developer**	**Tenant**
Available Land High Vacancy	No Benefit	Modest Benefit (reduced land cost)	Large Benefit (lower lease cost)
Available Land Low Vacancy	No Benefit	Large Benefit (reduces land cost) (high lease rates)	No Benefit
Scarce Land High Vacancy	Moderate Benefit (higher land prices)	No Benefit	Moderate Benefit (lower lease cost)
Scarce Land Low Vacancy	High Benefit (higher land prices	Large Benefit (reduces land cost) (more leasable space)	No Benefit

Source: Cambridge Systematics from Kuzmyak 2003, pg 71

One major concern regarding reduced parking requirements for residential areas is the resale value of the home. Several interviewees believe that the resale value of a house or condo will be higher if it includes a parking space (Gilchrest 2005, Glascock 2005, Pangaro 2005). Even in close proximity to transit, there is no guarantee that buyers will not want parking or that they will not be willing to pay for it. Jia and Wachs found that parking accounted for 12% and 13% differences in the resale prices of homes and condos respectively (1998). There is clear statistical evidence that parking adds to the payout of a home upon sale.

This belief in the high value of parking related to housing is apparent in the UK as well. When surveyed, most home occupants near London estimated a £10,000 – 20,000 loss in revenue if parking were not included in the sale price. When asked "If you were offered the opportunity to purchase a property of the same design as your current home but in which the [parking] space was to be replaced by living accommodation, do you feel this would add or detract from the value of your property?," 83% of those surveyed responded it would detract. One person surveyed stated: "I do not use a car myself, but believe a property without a parking space is a poor investment." (Stubbs 2002, 228).

Environmental Concerns

Direct environmental impacts from the parking supply include loss of open space and land permeability and contamination of runoff water. Parking space dimensions range from 325 to 400 square feet; when multiplied by several thousand per urban area, the amount of permeable space is reduced substantially. Developers must often trade open space around a building for surface parking spaces that are required by zoning regulation. These are usually paved, reducing drainage capacity and increasing the risk of flooding. Automobile fuel and operating fluids, among other substances, frequently leak onto non-permeable parking lots and streets and are carried into the water system during rain and storm events. Since the pollutants are not absorbed by soil where it is diluted by groundwater movement, the parking lot can become a problematic source of water pollution that requires mitigation (McCourt 2004).

Indirect environmental impacts from the parking supply are local temperature changes, air pollution, and climate change (Pucher and Lefevre 1996). Concrete and pavement become hot in sunny conditions and contribute to the urban heat island phenomenon. The larger the expanse of paved parking, the hotter and more unpleasant the area is for pedestrians (McCourt 2004). Additionally, in dense urban areas experiencing the heat island situation, energy use increases as people use air conditioning and fans to cool down.

As free and expansive parking promotes low density development that requires more vehicle miles traveled, automobiles more fuel and emit more pollution because they are driven more. As the vehicle miles traveled increases faster than road capacity, congestion builds and air quality degrades (McCourt 2004, Gómez-Ibáñez 1980). The congestion leaves cars idling in the same area for an extended period of time, burning more fuel and causing an accumulation of air pollutants and greenhouse gases. Greenhouse gas accumulation in the atmosphere is now understood to contribute to climate change, which ranks as one of the most challenging environmental problems society faces. If the road capacity is expanded to relieve congestion, the area covered by concrete increases and exacerbates the runoff problem mentioned above. Vehicle miles traveled also increases along with fuel consumption, which adds to the concentration of greenhouse gas emissions and climate change.

CHAPTER 3: SMART GROWTH POLICIES & OBSTACLES TO IMPLEMENTATION

The problems caused by decades of traditional growth and auto-oriented development are far reaching and extremely difficult to change. Woven into the complex of relationship between transportation, land use development and real estate is a financial advantage for perpetuating the current system. The previous chapter clearly established that developers and lenders are able to profit from providing off-street parking for residential developments, despite the fact that construction costs for parking are high. Efforts to switch from traditional to Smart Growth will be extremely difficult if the financial returns are not as high; however, given the problems associated with traditional growth, the changes are essential. The following chapter outlines the objectives of Smart Growth, underscores the importance and benefits of the Smart Growth approach to development and parking, and establishes key obstacles in shifting from traditional to Smart Growth policies and implementing them.

Smart Growth[10] and transit-oriented development (TOD) are considered a return to the pre-zoning ordinance development patterns – higher density, mixed use areas that encourage community engagement. It is a reaction to the perceived wastefulness of suburban sprawl that is manifested in increased capacity of roads and highways, growing congestion, loss of community engagement, over-use of natural resources, and loss of natural open spaces (TCRP 1999). Smart Growth purports to reverse the separation of uses by a hierarchical scheme and return to the development of communities at a scale that encourages "livability" or having the services and amenities within walking distance from the home and a greater sense of neighborhood engagement while protecting the natural environment.

[10] Smart Growth is also closely related to New Urbanism, which is a movement aimed at improving the livability of neighborhoods, increasing density and providing more mobility options for residents. For simplicity's sake, the discussion will only refer to Smart Growth, although many of the principles are included in New Urbanism.

The objectives of Smart Growth are to:

- Mix land uses: development that is location efficient, expanding mobility choices beyond the automobile rather than depend on it
- Re-establish community and civic engagement (neighbors and decision making)
- Relieve auto dependency, hold generation of vehicle miles traveled below a certain level of congestion, and maintain a certain level of accessibility in terms of time (Belzer and Autler 2002, Salvucci 2005)
- Transit oriented development by compact land development, walkable communities, and more transportation options for residents (Dittmar and Ohland 2004)
- Diversify the community by providing housing opportunity and choice via fair and cost effective development
- Protect natural resources through compact and efficient development (EPA 2005)

The basic policies for Smart Growth include zoning that allows for mixed use development and is flexible to accommodate community needs, building codes that allow residential and commercial uses within the same building (while maintaining safety standards), housing regulations that require inclusion of affordable units in buildings with middle and high property values, transportation and street design regulations that support alternative modes of mobility and reduces vehicle miles traveled, and protection of open spaces. These policies relate to social needs and equity, population density, and road capacity (TCRP 1999, Feigon et al 2003, Stubbs 2002, Kuzmyak 2003).

Transit-oriented development (TOD) is an important aspect of Smart Growth that seeks to increase the mobility choices for individuals and encourage walking and public transit use in high density areas that are well served by transit. Rather than reiterate all that has been said before, the working definition of TOD for this report is derived from Belzer and Autler as development that offers location efficiency in the form of increased choices for transportation to accomplish daily tasks, "value recapture" (savings on transportation for both the individual and the community), livability, financial return, choice, and efficient regional land-use patterns (2002). TOD has the following major characteristics: density supportive of transit services; mixed land uses that encourage walking;[11] less automobile ownership accompanied by less vehicle miles traveled (VMT) per vehicle; proximity of retail, employment and residential areas to transit stations; grid street design; and pedestrian-oriented guidelines to reduce auto dependency (TCRP 1999).

The treatment of parking in development plays a large role in how the area functions as a regional node and local community resulting in either traditional growth or Smart Growth. Since parking is considered a major contributor to traffic generation and congestion, the balance between supply and demand is critical. High parking ratios based on the proportion of automobiles to households or office space result in less dense, more auto-dependent, traditional development. It reduces the options for alternatives that increase the chances for behavioral changes in people. Lower parking ratios based on context-sensitive design, road capacity and access to non-auto modes of transportation are the basis for more Smart Growth oriented development and increase the likelihood that people will not drive because it is not automatically the most convenient mode.

A great difference between Smart Growth and traditional parking regulations is the use of maximums versus minimums. Traditional growth's use of parking minimums frequently provides more parking than is demanded on average and contributes to increasing vehicle trips by improving the convenience of driving. A parking maximum establishes a type of cap on parking that works to encourage alternative modes such as transit and walking (TCRP 1999). Under this type of regulation, the developer is faced with proving the need for more parking than is called for, which is difficult since the requirement is based on the context of the neighborhood. The maximum should also help keep residential costs and housing prices down since fewer expensive parking structures will be needed to meet the parking ordinance.

With regard to non-residential areas, Smart Growth policies encourage employers to engage in reducing the demand for parking. A national survey in 1995 indicated that 80% of employers

[11] John Pucher observed 2 pedestrian or bicycle trips for every one transit trip in German cities well served by public transportation, which highlights the importance of pedestrian activity and accessibility (Pucher and Lefevre 1996)

provided free or subsidized parking to employees while only 1% provided transit benefits (34% of sampled employers were in locations with at least some transit service)(Kuzmyak 2003). Since "[e]mployer-paid parking is an invitation to drive to work alone," significant reductions in vehicle trips per commuter may be possible (Shoup 1995). Table 3.1 shows the potential reduction in single occupancy vehicle commutes by switching from employer-paid parking to a driver-pays scheme. Aside from removing subsidies for employee drivers to park for free, parking cash out programs,[12] preferential parking for carpools, and discounted public transportation passes are ways employers have altered the commuting pattern of their employees.

Table 3.1 Estimated Reductions in Solo Commutes to Work

	Solo-Driver Mode Share			Cars Driven to Work per 100 Employees			
Location and Date	Employer Pays	Driver Pays	Difference	Employer Pays	Driver Pays	Difference	Price Elasticity of Demand
Civic Center, Los Angeles, 1969	72%	40%	-32%	78	50	-28	-0.22
Downtown Ottawa, Canada, 1978	35%	28%	-7%	39	32	-7	-0.10
Century City, Los Angeles, 1980	92%	75%	-17%	94	80	-14	-0.08
Mid-Wilshire, Los Angeles, 1984	42%	8%	-34%	48	30	-18	-0.23
Warner Center, Los Angeles, 1989	90%	46%	-44%	92	64	-28	-0.18
Washington DC, 1991	72%	50%	-22%	76	58	-18	-0.13
Downtown Los Angeles, 1991	69%	48%	-21%	75	56	-19	-0.15
Average of Case Studies	67%	42%	-25%	72	53	-19	-0.15

Table from Shoup 1995.

Smart Growth parking policies also use shared parking as a tool to reduce the amount of land used for parking. The concept behind shared parking is to allow land uses with offset peak parking hours to share the parking lot and reduce the amount of separate parking spaces required. For instance, an office typically demands parking between 8am and 6pm. A movie theater or entertainment complex usually draws its parking demand after 6pm when the office employees have left. Shared parking does not reduce vehicle trips or peak traffic congestion; however, it does work to reduce environmental impacts of the parking supply and reduce the cost of development (Gupta

[12] Parking cash out programs refer to the option for employees to receive a "cash allowance equivalent to the parking subsidy the employer would otherwise pay." 1992 California legislation (Shoup 1995)

2005). Research from the Urban Land Institute estimates that shared parking can save 5 to 49% of parking spaces (Kuzmyak 2003).

Along the same vein as shared parking is the idea to centrally locate parking rather than allocate it to each building (Chase 2005). By placing parking at regulate intervals (four or five blocks, for instance), all drivers would need to spend a portion of every trip as a pedestrian and interact with the community. The number of curb cuts would be reduced, further improving the pedestrian environment. The number of car trips for local errands would be reduced (why walk five blocks to the car when the store is only five blocks away due to high density mixed use development?). Additionally, the automobile and parking would be lessened as a status symbol for wealth and class since everyone would be a pedestrian and mingle with others on the street for at least a portion of their daily trips.

Overall, the objectives of Smart Growth parking policy provide more reliable and long term solutions to the parking problems presented in Chapter 2. These programs and tools reduce the demand for parking by removing parking subsidies, increasing density and mixing uses, and providing better transit services. They unbundle parking and unit prices that make developments more affordable to a greater range of people. The policies also strive to make the supply of parking more efficient to reduce the negative environmental impacts that result from excessive parking.

Obstacles to Implementing Smart Growth

While Smart Growth provides solutions to traditional growth problems, traditional growth has the advantage of being well entrenched in government policies, current real estate market demands, and individual behaviors. For those stakeholders doing well for themselves with traditional growth development, it is the smarter type of growth. It will take strong leadership and decision making to change the current system from familiar and profitable development to new and less-economically focused Smart Growth. With regards to parking, the difficulties in switching from traditional to Smart Growth policies vary depending on the objectives of the parking policy itself. The following section highlights stakeholder and policy factors impacting a city or region's ability to shift from traditional to Smart Growth and reduce parking requirements.

The Stakeholders

Shifting from traditional development to Smart Growth affects numerous groups and individuals that should be involved in the decision making process. Stakeholder participation is important to successful planning and urban development since their cooperation often determines the degree to which the plan is implemented. When an interested party is not satisfied with the final decision it is able to appeal the decision to various groups, seek variances on the rule, or find other ways to slow or block implementation of the new policy. This research focused on how developers, lenders and communities act as stakeholders involved in adopting and implementing Smart Growth parking policies and how their perceptions shape the degree to which they accept it.

Developers and lenders involved in the real estate market pose challenges to addressing problems caused by the parking supply. Several sources indicate the perceived risk associated with transit-oriented development and parking reductions make developers and lenders hesitant to propose and fund such projects (Kuzmyak 2002, Dittmar and Ohland 2004). Their reservations are based on interpretation of buyer preference and demand pull for parking in an area. Of primary concern is the return on investment; some lenders require new construction to have the same parking ratios as competing buildings that already exist. With such control over maintaining high parking ratios and the expense of retrofitting parking supply for current buildings and occupants, the process of moving toward development with less parking is incremental and problematic (Kuzmyak 2003).

Lending institutions have a set of criteria they use to determine the costs and benefits of development projects. According to Jim Meleones at Bank of America, the criteria include prospective tenants, lease terms market rent, staggered lease ends, occupancy rates, competition, ingress/egress, and parking supply (2005). The parking supply is a critical factor and the developer's performance record regarding parking is considered. Land use changes, such as mixed use and higher density, that promote walking and transit take time to develop, often *at least* a decade (Verhoef et al 1995). Lenders and developers tend to only forecast 5 to 10 years out, making the willingness to risk significant investments on slow changing land uses unpalatable. Many view the opportunity costs of such development too high to justify the risks, especially when providing ample parking supply is so profitable for the developer and lender.

Lenders may be willing to accept the risks they associate with reduced parking ratios if they are presented with convincing evidence of likely success. Lenders may be persuaded to accept parking ratios that are lower than normal when presented with evidence of how parking requirements can be met, neighborhood support (or at least a lack of opposition), and adequate transit capacity and service quality that will enhance the project's marketability (Dittmar and Ohland 2004). Examples of similar successful developments can help shift their attention from the risks to the rewards (profits) of investing in Smart Growth development.

Current owners and occupants of a neighborhood often oppose reducing parking requirements for new developments. They perceive lower parking ratios and increasing density as a threat to the community life they enjoy. Allowing new residential units to be built without off-street parking increases competition for street parking, which is already scarce. Residents do not want to lose their own on-street parking spaces to increased competition. They also oppose the increased traffic higher density will cause. Some even just oppose the density, preferring to maintain the status quo and current neighborhood character.

Communities also object to reduced parking in commercial areas in the city because of the spillover. Occupants frequently seek ways to limit parking in their neighborhood to residents and personal visitors. In urban settings, residents have a greater tendency to take public transportation or walk to work (see Figure 4.2 and additional maps in Appendix B). But if they own a car, they need a place to park it during weekdays, as well as overnight. They see daytime parkers as a threat to their ability to park their own cars within a reasonable distance from their home. As citizens of the city and town in which they live, residents have voting power that businesses and commercial retail do not. When organized, communities can pose tough opposition for zoning changes aimed at reducing parking ratios and increasing density.

The Policies

A common thread in all of the literature dealing with parking policy is that it cannot be implemented as a stand-alone policy and be expected to accomplish congestion reduction, higher transit use, affordable housing, and more equitable balance between housing and jobs. Parking policy works best when implemented as part of a program of policies aimed at improving the quality of life in urban areas and reducing auto-dependency. Rather than a "silver-bullet" policy that will solve all the urban transportation problems, several combined policies working toward a common goal are more effective. "There is some consensus on the most desirable mix of policy options available for promoting [Smart Growth]….parking maximums, shared parking, flexible zoning for increased densities and mixed uses…and design emphasis on sense of place and pedestrian friendliness." (Feigon et al 2003) The need for multiple policies that influence land use, density, transportation planning and housing to change current development patterns is a logical conclusion given the number of government policies that were enacted to support auto-oriented development in the first place. The previous legislation established financial and cultural norms for an auto-dependent lifestyle that have become entrenched in society. Shifting those behaviors toward a more balanced mix of transportation uses will require multiple policies that are strong, enforced and influence the market as much as their predecessors did.

There are some significant obstacles to adopting a package of policies that intend to reduce auto-dependency and encourage transit use and walking. Political will is perhaps the strongest. If a decision maker does not sense that her constituents approve of the reduced parking ratios, she is less likely to push for adopting the policies. Political terms last two to six years, whereas shifts in land use and development take decades. Politicians may consider it too risky to push regulations that will not provide benefit until after the election cycle. Additionally, not all of the policies in a package will receive the same support. Some may be passed and some may not, leaving a haphazard set of policies that has little chance of accomplishing their combined goals. Then there is the fact that people, in general, like their cars and may not be prepared to accept as an individual the need to rely on it less. As a voter, they may choose to dismiss those politicians forcing them to make such changes. A developer earning significant profit from providing parking for auto-oriented growth may not be willing to risk his financial gains and also vote out politicians supporting Smart Growth or provide campaign funding to those who oppose it.

Adopting multiple policies to reduce auto-dependency and parking supply will require establishing complementary services and accepting some tradeoffs. Perhaps the most commonly cited change to complement parking reductions has been increasing public transportation capacity and pricing schemes to control congestion. Several interviewees mentioned the need and support for greater transit capacity in response to reductions in parking supply (Begelfer 2005, Nichols 2005, Glascock 2005, Kressle 2005). A key tradeoff is the increased operating costs for public transportation as its capacity and ridership rise. Many economists argue that revenue for the transit system can be generated by bringing parking prices up to market values, or imposing a congestion charge; however, the political feasibility of these responses has been questioned. Table 3.2 lists additional tradeoffs between costs and benefits from policies intended to limit auto access to the CBD.

Table 3.2 Benefits and Costs of CBD Auto Restraint Measures

Benefits	Costs
Transportation	
Reduced travel times, costs and inconvenience to auto and public transport users due to lower congestion levels	Increased travel times, cost, and inconvenience to auto users who avoid restraints by switching to public transportation, modifying routes, shifting time of day, or changing other trip aspects
Reduced need to expand road system capacity	Increased travel times, cost, and inconvenience to auto users due to increased congestion outside of the CBD
	Added public transporation deficit given increased ridership
Environmental	
Reduced air pollution and energy consumption from auto use	
Economic	
Increased CBD employed from successful regional strategy	Reduced CBD employment opportunities and tax base due to reduction in economic activity
Administrative	
	Cost of implementation

Source: Adapted from Gómez-Ibáñez 1980.

The role of the real estate market cannot be underestimated as an obstacle to adopting Smart Growth. Traditional growth has shaped the market for eighty years into a system that financially benefits from low-density land uses and auto-dependency. Shifting from traditional to Smart Growth will most likely not provide the same financial benefits to the same people as it works to shift real estate market incentives. The goals of Smart Growth include making housing more affordable and increasing transportation choices for more of the population. It seeks higher densities in urban areas so that pedestrian and transit trips are at least as convenient as car trips. These goals reshape housing demand and reliance on the car that shift the type of development that is most profitable, where that development is located, as well as how much profit is earned. With success being closely associated with annual income in the United States, it will be extremely difficult for those earning the most from traditional development to agree to a shift toward Smart Growth. The only way to move away from traditional development is through strong political convictions that Smart Growth is the right type of growth and establishing strong policies that will be implemented and enforced. Chapter 4 establishes through research results why Smart Growth is the right kind of development for the study areas. Chapter 5 uses the research to establish the case for Smart Growth in the greater Boston metropolitan area.

CHAPTER 4: CASE SITES – FINDINGS AND DISCUSSION

Since Smart Growth is context sensitive in its policy formulations, the research began by looking at the Boston area by focusing on the study areas. Research into the job, housing and transportation situations at the sites give the basis for policy suggestions in each locality, as well as provides insight into the variability of development across the greater metropolitan area (GMA) and which approaches to adopting Smart Growth will be most successful. The results in this chapter are reported by study site and include data on current parking regulations, job and population density, and mode split. The degree to which each site can be considered a niche market for Smart Growth is also addressed.

North Station

Current Situation

North Station is the site located closest to Boston's central business district and most closely employs Smart Growth principles. The site is centrally located in downtown Boston with access to the commuter rail (north bound), subway (green and orange lines), buses (1 bus at North Station, 15 routes via nearby Haymarket Station), highways (Route 93) and major urban arterials (Causeway Street, North Washington Street and Merrimac Street). The area has historically been a manufacturing and industrial center. Over time it has become a high density office and entertainment zone given its proximity to transit access and the sports arena that houses the Boston Bruins and Celtics. It was previously isolated from pedestrian access to the rest of downtown by the elevated Central Artery and Green Line light rail. The recent removal of both structures has opened the area up to new development that will include additional office space and residential units. The new development is subject to zoning code changes implemented within the last five years that limits the amount of parking allowed for each land use.

North Station has 25,500 daily commuter rail riders and 13,200 daily subway riders,[13] making it the busiest station in the North and West End. Haymarket, which is approximately half a mile from the North Station, is served by 15 bus routes and the green line as well (CTPS 2002). The capacity of such a system indicates a significantly reduced need for excessive parking supply; however, the number of parking permits issued for the North End is up 23% from 1990, which undoubtedly impacts the demand for parking near North Station given proximity to the neighborhood (CTPS 2002). As of 1996, the North Station area supported 11, 300 jobs (33,300 total for the North and West End). There is little residential development currently near North Station, but this is slated to change as the area redevelops with removal of the elevated tracks and highway. Table 4.1 provides a summary of parking available near North Station

The current parking regulations under existing zoning for the North Station area range from none required to required for residential projects based on location. The Boston Transportation Department's proposed parking ratio goals are 0.4 spaces per 1000 square feet of office space and per hotel room; and 0.5 to 1.0 spaces per residential unit depending on the housing type (CTPS 2002, pg 30).

Table 4.1 Summary of Parking Supply for North Station (1997-1998)

		Total		Public		Residential	
	Location	**Off Street**	**On Street**	**Off Street**	**Meters**	**Off Street**	**On Street**
North Station	North Station	3103	280	2045	159	10	7
	North End	2560	1625	496	66	776	1122
	Government Center	6747	564	4166	212	425	111

Source: CTPS Parking Inventory

[13] These numbers refer to boardings only at North Station.

Research Results

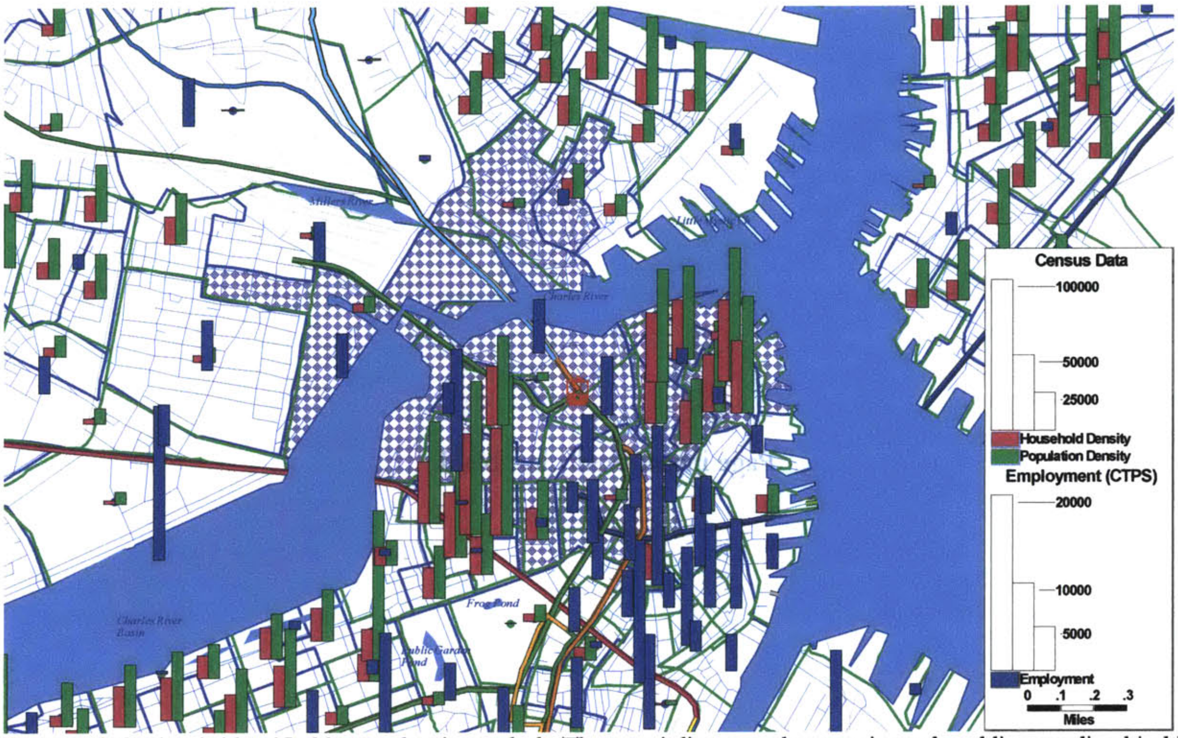
In the North Station map (Figure 4.1), the balance between jobs (blue bars) and population (green bars) and housing (pink bars) is skewed. Jobs and housing do not appear to be located in the same areas. The area immediately surrounding North Station is largely employment, with the housing and job density immediately to the right (North End) and to the left (West End, Beacon Hill and Back Bay).[14] The large number of jobs located east and south of North Station represent Boston's financial district. The relatively bare section that runs through the middle of the map to North Station follows the previous route of the elevated central artery that is currently under redevelopment. Based on the development plans, the swath of land previously covered by the artery south of Hanover Street will be used for park lands surrounded by higher density housing and employment centers. The air rights north of Hanover Street to the Charles River will be developed as commercial and residential areas.

The mode split for the home to work commute for North Station reveals that nearly half of residents near the area walk to work; approximately one-third use public transportation; and another third drive alone (see Figure 4.2). The high percentage of walking trips by residents living near downtown Boston reinforce the principle in Smart Growth that high density development with mixed uses encourages more pedestrian trips than car trips. In addition, while the pie charts only capture the commuting trips of those who live near North Station, the daily ridership counts mentioned above indicate that public transportation is widely used in getting to this city through North Station's commuter rail stop.

North Station has the highest potential for Smart Growth development than the other sites studied. The new proposed parking regulations and planning guidelines for the area encourage mixed used development and non-auto modes of transportation. The area is ready for new

[14] Chapter 5 includes data on housing prices for these areas and how they compare to the GMA.

Figure 4.1 Population and Housing Density and Number of Jobs for North Station



Note: North Station is identified by a red train symbol. The transit lines are shown using colored lines outlined in black. The blue shading represents block groups within ½ mile of the station or approximately a 30 minute walking trip.

Figure 4.2 Transportation Mode Split for North Station Area of Downtown Boston

North Station is identified by the red trolley symbol. The shaded area represents approximately 30 minute walking time.

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development that will generate additional jobs and housing. Affordable housing to support a diverse neighborhood may be the most difficult Smart Growth principle to implement near North Station. Housing prices in this area are high due to its prominent location near downtown Boston, the harbor, and other amenities. One of the developers interviewed is currently building a residential housing project several blocks from North Station in which units are selling for around $500,000 plus $80,000 for parking. Convincing him and other developers with similar profits from parking to reduce the amount provided for residential units will be difficult. However, Boston's parking regulations for this area are low and the transit capacity is adequate. All that is needed for North Station to be more Smart Growth oriented is strong political leadership to enforce the parking limits and provide opportunities for affordable housing.

Ruggles

Current Situation

Ruggles Station is located just southwest of the central business district between the communities of the South End, Fenway/Longwood Medical Area, and Roxbury. The area has more dense land use than suburban sites but is substantially less dense than downtown Boston. It is served by 14 bus routes, the orange line and Attleboro/Stoughton line of the commuter rail. Despite its high transit capacity, the area suffers heavy congestion along Columbia Avenue and Melnea Cass Boulevard. This may be due to the station's proximity to an entrance/exit for state route 93 off of Melnea Cass Boulevard via the Massachusetts Avenue Connector. The number of parking permits issued for neighborhoods surrounding Ruggles station is up 21% (Fenway) and 26% (South End)[15] from 1990, which indicates growing parking demand in the area (CTPS 2002). Table 4.2 provides a summary of parking available near Ruggles.

[15] Numbers for Roxbury were not available.

Table 4.2 Summary of Parking Supply for Ruggles (1997 – 1998)

		Total		Public		Residential	
	Location	Off Street	On Street	Off Street	Meters	Off Street	On Street
Ruggles	Fenway	6161	5579	3184	1894	838	2197
	Longwood	14223	3576	5631	296	1860	1660
	Roxbury Crosstown	1893	3372	210	0	48	48
	Roxbury SW Corridor	3026	4793	129	12	467	76

Source: CTPS Parking Inventory

The current parking regulations under existing zoning for the Ruggles area vary by the three neighborhoods surrounding it. Table 4.3 summarizes the current and proposed parking regulations for these areas. The proposed goals take into account proximity to transit and upcoming transit projects. For the Ruggles area, this includes the proposed Urban Ring project that will circumferentially connect several lines of the current subway system by either bus rapid transit or light rail. The Silver Line has already been improving access to the Roxbury area and will continue to improve service as Phase 3 connects the above ground Dudley to Boylston section to the subsurface South Station to Logan airport section. The improved neighborhood accessibility to more of the greater Boston metropolitan area via transit should reduce its need for parking.

Ruggles station is slated for Smart Growth development as part of greater Boston scheme for neighborhood districts set out in *Access Boston* (CTPS 2002). However, a lack of development investment and growth has inhibited implementation of new zoning codes that encourage mixed use other Smart Growth principles. The area has good access via commuter rail, subway, bus, and cars, but is dominated by institutional control (primarily Northeastern University) and suffers from a previously negative reputation regarding crime and dilapidated housing. The residential population around Ruggles is lower income minority. There is a great opportunity for livable neighborhoods in the area if investment can be ratcheted up and required to implement Smart Growth principles of mixed uses, reduced parking and diverse incomes, but implementing this has been inordinately slow.

Table 4.3 Parking Regulations and Goals for Neighborhoods Surrounding Ruggles Station

Location	Existing Parking Requirements	Proposed Parking Ratio Goals
Longwood Medical Area	*Restricted parking district *Institutional overlay district *Residential: 0.6-0.9 spaces/unit based on floor area ratio	*Non residential: 0.75 spaces/1000sf *Residential: 0.75 spaces/unit
West Fenway/Kenmore	*Restricted parking district *Residential: 0.7 spaces/unit	*Parking Restricted Overlay District *Non residential: 0.75 spaces/1000sf (max) *Residential: 0.75 spaces/unit (min & max)
Roxbury	*Office: 0.5 spaces/1000sf *Hotel: 0.7 spaces/hotel room *Residential: 0.2-1.0 spaces/unit based on housing type	<u>Distant from MBTA Station</u> *Non residential: 1.0-1.5 spaces/1000sf *Residential: 1.0-1.5 spaces/unit based on housing type <u>Near MBTA Station</u> *Cost of parking should be equal to or greater than transit cost *Non residential 0.75-1.25 spaces/1000sf *Residential: 0.75-1.25 spaces/unit based on housing type
Roxbury (Dudley Square)	*Office: 0.5 spaces/1000sf *Residential: 0.2-1.0 spaces/unit	*Non residential: 0.75 spaces/1000sf *Hotel: 0.4 spaces/hotel room *Residential: 0.5-1.0 spaces/unit based on housing type

Source: CTPS 2002

Research Results

In the map of Ruggles Station (Figure 4.3), there is a distinct drop in the housing and population density compared to the South End, which is just above the station. There are also fewer jobs in the areas directly surrounding the station. The map shows the area around Ruggles to be a peninsula of low housing and job density that juts into the highly developed and dense South End and Longwood Medical Area (LMA). Of course, it should be noted that some of the LMA housing and population density may be due to dormitories and resident housing for Harvard Medical School and other colleges in the area. The high population density area immediately north of the station is where Northeastern University is located, which also includes student housing.

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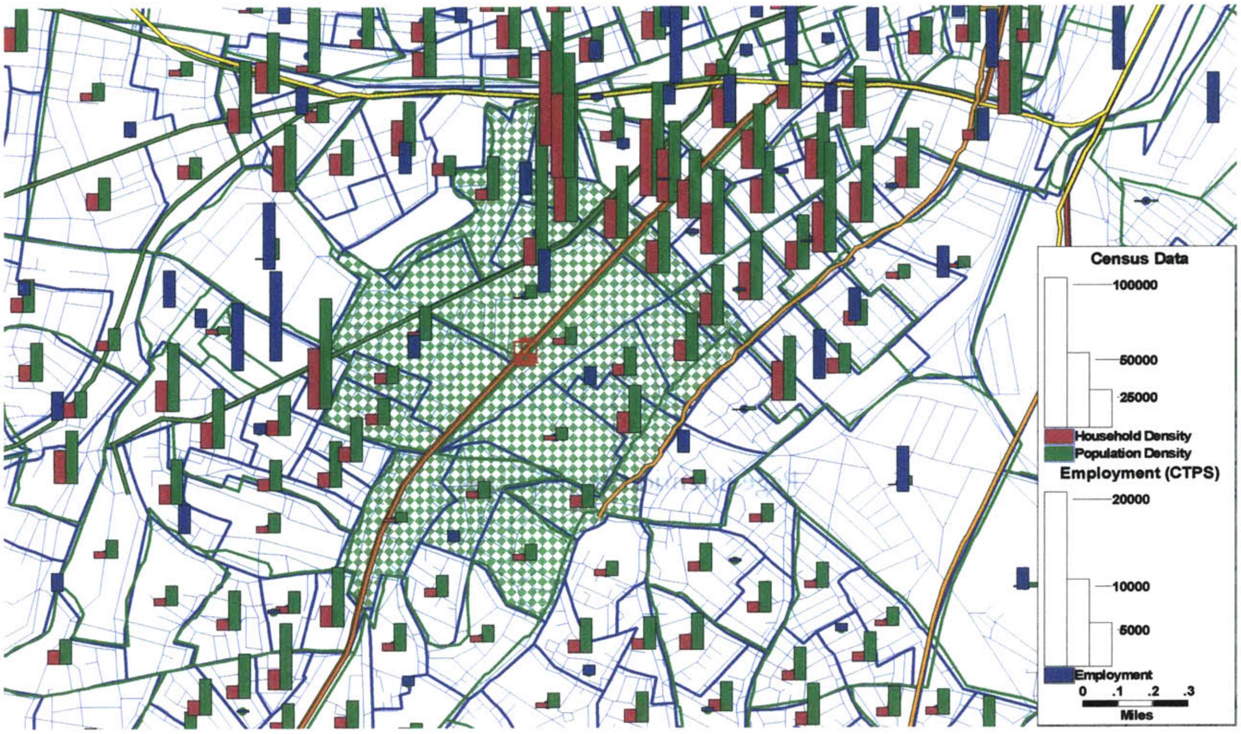
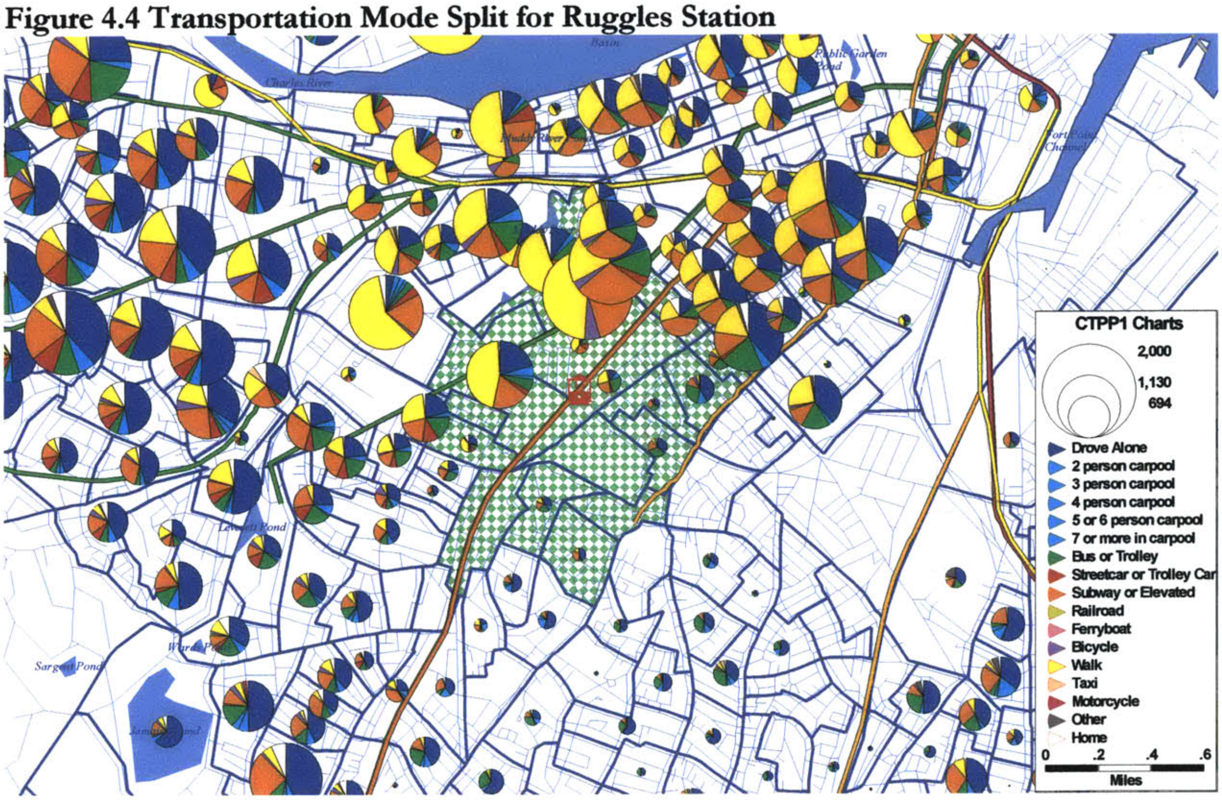
Figure 4.3 Population and Housing Density and Number of Jobs for Ruggles Station



Note: Ruggles is identified by a red train symbol. The transit lines are shown using colored lines outlined in black. The green shading represents block groups within ½ mile of the station or approximately a 30 minute walking trip.

Figure 4.4 Transportation Mode Split for Ruggles Station



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The lower density development south of Ruggles station makes it vulnerable to continued auto-oriented development despite its proximity to transit and downtown Boston. The mode split in Figure 4.4 indicates much higher car use for commuter trips than north of the station and in the downtown. Bus use is high for most of the area and transit use follows closely with proximity to the tracks. Overall, Ruggles station has incredible potential for Smart Growth development. The area has decent public transportation options and room for significant service expansion once density is increased; housing prices are low for being so close to downtown; and the opportunity for mixed used development is high. None of the research performed for this research indicated why the area just south of Ruggles Station is not developing at higher density. The city should focus development efforts on making this area into an example of Smart Growth for the rest of the city to follow.

Quincy Center

Current Situation

Quincy Center station is located in a suburban center, which is defined by the Institute of Transportation Engineers as "downtown areas of suburbs that have developed CBD characteristics but are not in the central city of a metropolitan region." (McCourt 2004). It is served by 14 bus routes, the red line, and the Middleborough/Lakeville and Plymouth/Kingston commuter rail lines. The town of Quincy recently launched a development program to revitalize Quincy Center since it serves as the downtown. Pedestrian linkages to and from the subway/commuter rail station are safe and convenient. Quincy Center has a more transit-oriented physical design, but does not function as a Smart Growth area. The current zoning requirements are remnant of traditional growth and not context sensitive given its transit connections.

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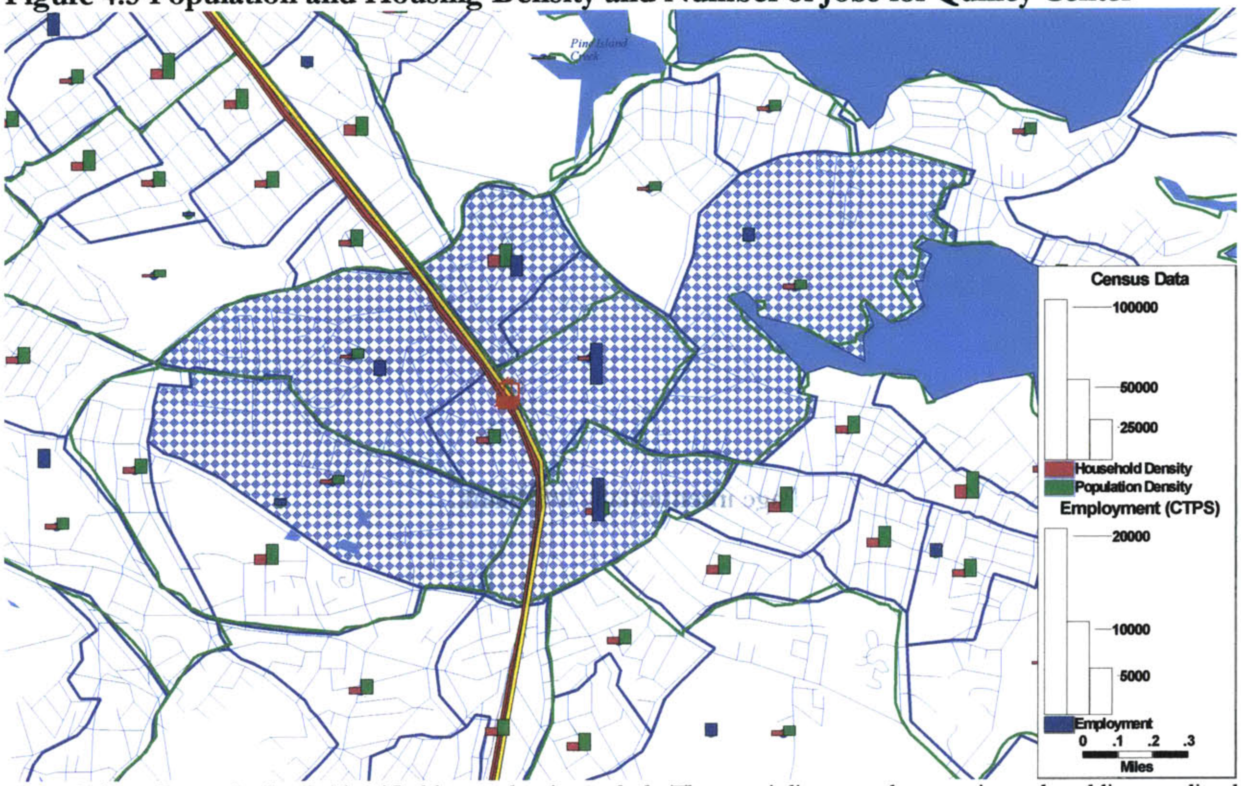
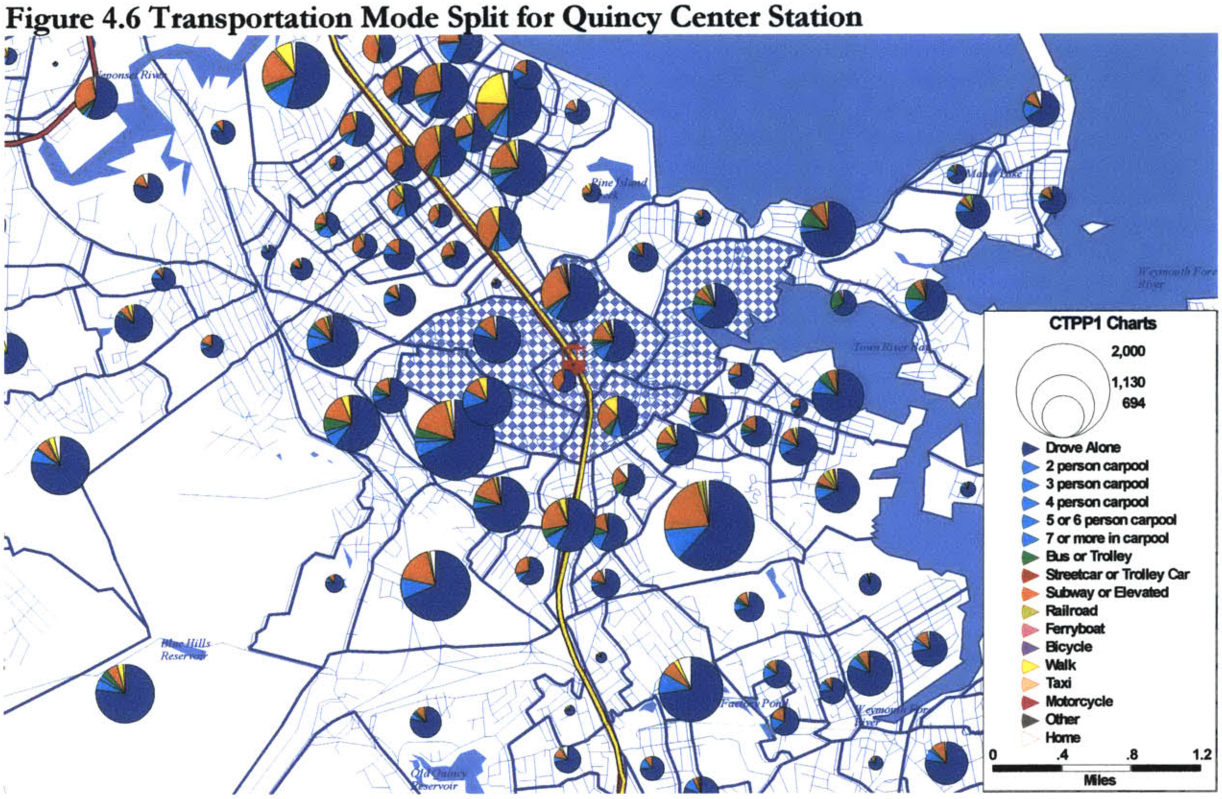
Figure 4.5 Population and Housing Density and Number of Jobs for Quincy Center



Note: Quincy Center Station is identified by a red train symbol. The transit lines are shown using colored lines outlined in black. The blue shading represents block groups within ½ mile of the station or approximately a 30 minute walking trip.

Figure 4.6 Transportation Mode Split for Quincy Center Station



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Research Results

The map of Quincy Center station in Figure 4.5 indicates that Quincy Center serves as an employment center for the area. The housing density surrounding the station is lower than that northwest and southeast of the station. The higher density to the northeast could be due to its proximity to route 93, a highway that leads into Boston. The dominance of the automobile in the mode split is not surprising given Quincy's low density development and distance between jobs and housing. Adopting Smart Growth principles in Quincy may be challenging due to its distance from Boston and current low density development. However, the political will to change current development patterns is apparent from the city's acceptance of the station area as a town center and the attempt at transit-oriented development. Further increasing housing and job density close to the station and reducing parking ratios are the incremental next steps for the area.

Alewife

Current Situation

Alewife station is located in Cambridge and serves as the northern terminal for the red line. In addition to the light rail, the area is served by seven bus routes. The Fitchburg commuter rail line runs near Alewife station, but does not have a stop located there. State highway routes 2, 3, and 16 converge on the area from points north, which draws a significant amount of traffic and congestion during peak hours. This is the most suburban of the case study sites and most embodies traditional development patterns. It is characterized by limited transit service, significant amounts of surface parking, poor pedestrian networks and connections, and low density-large lot developments.

A conclusive report of the parking inventory for the area was not available, so the supply data is incomplete. Along Cambridge Park Drive, there arc 4,592 parking spaces between surface lots and garages. The Alewife station commuter parking garage accounts for 2,000 of these spaces.

The major shopping centers on either side of Alewife Brook Parkway less than a half mile from Alewife station provide 1,591 surface parking lots (Schrieber 2005).

In 1998, the City of Cambridge adopted a Transportation Demand Management Ordinance that guided how traffic was managed in the increasingly dense city. In 2002, the City updated its zoning ordinance, including Article 6 that addresses off-street parking requirements (Preston 2005). According to the parking ordinance, "the number of parking and loading spaces required...varies according to the type, location and intensity of development in the different zoning districts, and proximity of public transit facilities." (Article 6 Section 6.11) The section also states "this [ordinance] requires development of adequate parking facilities to meet the reasonable needs of all building and land users without establishing regulations which unnecessarily encourage automobile usage." The city has been reviewing and planning for the Alewife area separately for nearly a decade. Alewife is the least densely developed area and has significant natural resources that benefit the city. These factors warrant careful consideration for how the area should manage imminent growth and development. Table 4.4 is an overview of the parking regulations that apply to Alewife under the 2002 land use ordinance.

The newer and expensive buildings along Cambridge Park Drive were established prior to changes in the parking requirements. These properties are exempt from the new parking regulation until they are redeveloped from their current use. The likelihood of redevelopment along this road is low since the companies have already invested significant funds in the present infrastructure. While the ambitions for the redevelopment and overlay district are aligned with Smart Growth ideals, the implementation of the policies will be limited to new employers moving into the area and long term before the current occupiers are ready to change their current establishment (Preston 2005).

Table 4.4 Overview of Cambridge Parking Requirements Relevant to Alewife

Land Use Category	Open Space	Residential C1 Business A	Business C Office 2 Residential C2 Industry B2
Residential Uses			
Single family detached	1 space/du	1 space/du	1 space/du
Elderly housing	1 space/2 du	1 space/2 du	1 space/2 du
Multifamily dwelling	n/a	1 space/du	1 space/du
Office and Lab Use			
Accountant, Lawyer/ Non-medical, Real Estate, Insurance, etc	n/a	1space/500 sf 1 space/250 sf	1 space/700 sf 1 space/350 sf
General Office	n/a	1 space/800 sf 1 space/400 sf	1 space/800 sf 1 space/400 sf
Bank	n/a	1 space/400 sf 1 space/200sf	1 space/600 sf 1 space/300 sf
Retail Business/ Consumer Service			
Retail Store/Barber/ Dry Cleaner, etc	n/a	1 space/1000 sf 1 space/500 sf	1 space/1400 sf 1 space/700 sf
Restaurant	n/a	1 space/5 seats 1 space/2.5 seats	1 space/10 seats 1 space/5 seats
Light Industry/ Wholesale			
All except auto related & storage	n/a	1 space/1200 sf	1 space/1600 sf

Source: Cambridge Zoning Ordinance Article 6, Schedule of Parking and Loading Requirements
Notes: minimum listed over maximum when two entries for one use; du = dwelling unit, sf = square feet

Research Results

As Figure 4.7 shows, the housing and population density falls off dramatically as one moves northwest away from Cambridge and Boston and there is a lack of balance between jobs and housing near Alewife station. There is especially little housing density in the two block groups that surround Alewife station. The blue area below the station is Fresh Pond, which is a protected park area that does not allow residential development and supports very few jobs. Spy Pond to the north of the station also takes up a large area of land. Both water bodies significantly limit the development and accessibility of the area surround Alewife Station. The area immediately to the right of the station contains Rindge Towers, two high density residential buildings that serve

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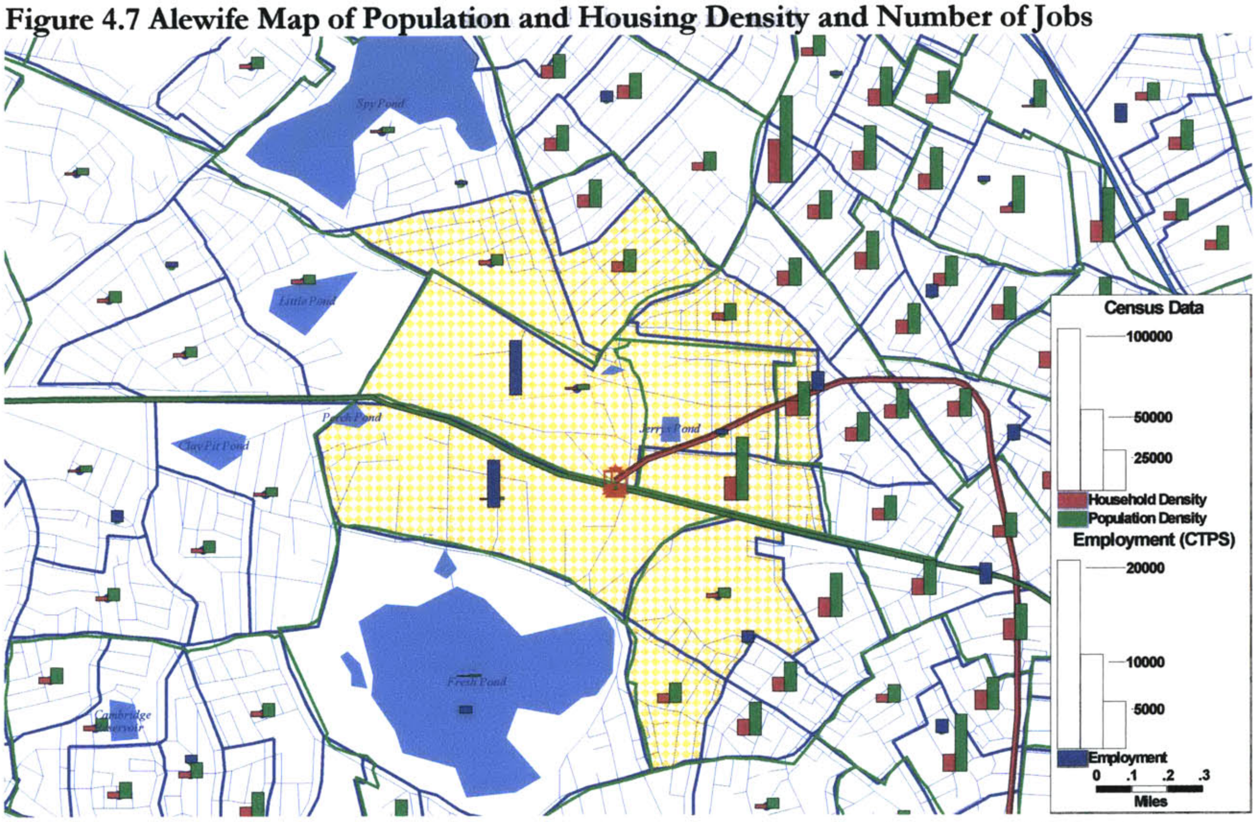
primarily as low income housing. Directly above that block group, where Jerry's Pond is located (small blue box above station) is the former industrial site for WR Grace that is currently undergoing environmental remediation for future development opportunities (McCabe 2004). Alewife serves largely as a transition from densely developed Cambridge to the outer suburbs of Arlington (north of Alewife Station) and Belmont (west of Alewife Station). Single occupancy vehicle trips are dominant in the mode split near Alewife station; however, subway trips make up approximately 25% of trips for the areas east of the station (see Figure 4.8).

Figure 4.7 Alewife Map of Population and Housing Density and Number of Jobs



Note: Alewife Station is identified by a red train symbol. Streets are shown by thin blue lines and the transit lines are shown using colored lines outlined in black. The yellow shading represents block groups within ½ mile of the station or approximately a 30 minute walking trip.

The plans have been set for Alewife to follow Smart Growth development as its land uses are redeveloped. The city of Cambridge has meticulously redesigned the development plan for Alewife to preserve the natural resources in the area as well as to take advantage of the subway

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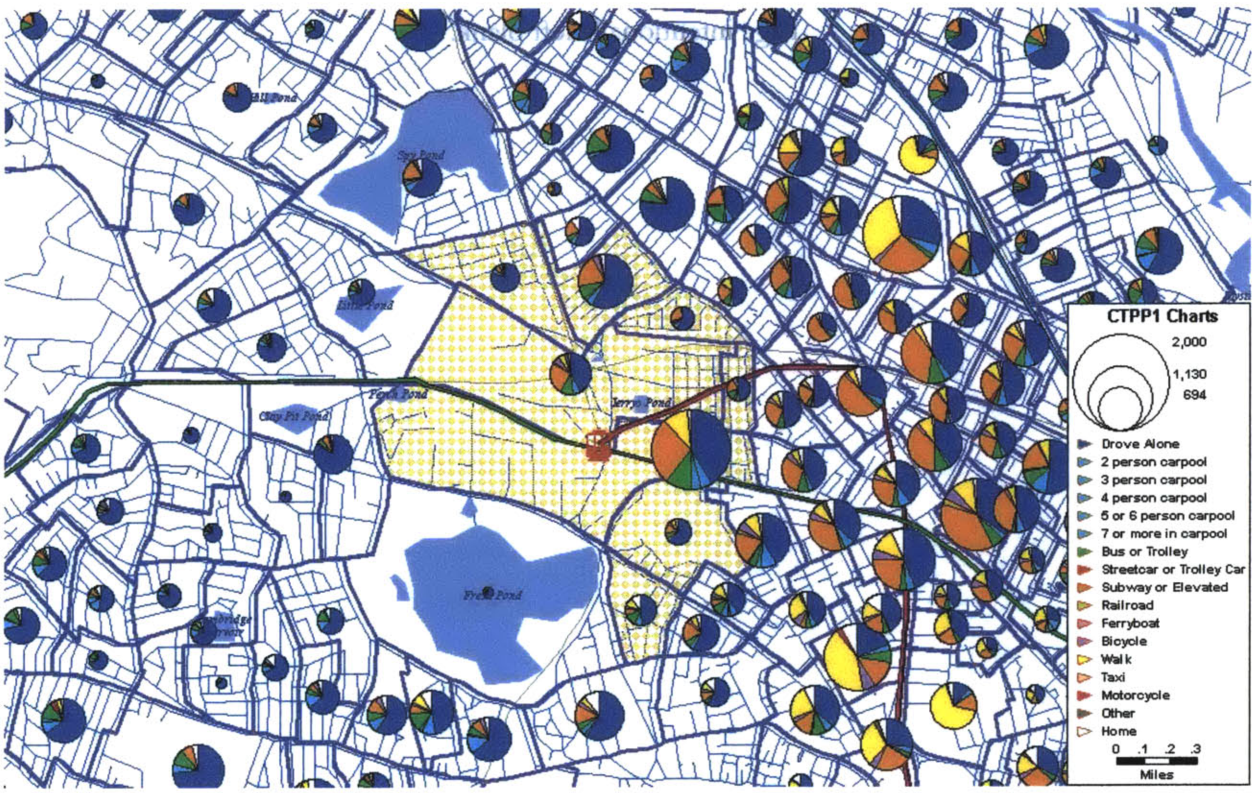
station and park-and-ride lot. The initial Smart Growth development will most likely occur along Alewife Brook Parkway where several strip malls and a movie theater are located. These buildings are older and less technology specific than those on Cambridge Park Drive. The potential to add a commuter rail station in Alewife would further reduce auto dependency for residents and those commuting to the area; although much needs to be done to improve the pedestrian environment around the station in order to encourage people to access the station by walking instead of driving.

Figure 4.8 Transportation Mode Split for Alewife Station



Upon reviewing the research results for each study area, it is clear that all locations have the beginnings of Smart Growth-oriented development and the possibility for successful Smart Growth in Boston is real. These conclusions are based on physical and demographic attributes such as job and housing density, rather than economic, social and political environments. Chapter 5 uses the research data on housing costs, travel times, parking appeals and interviews to paint a clearer picture of the political feasibility of adopting Smart Growth in Boston.

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CHAPTER 5: THE CASE FOR SMART GROWTH IN BOSTON

The greater Boston metropolitan area has the advantage of having historically high density development, the reputation for being a pedestrian friendly city, and has one of the country's largest transit systems.[16] However, Boston's urban areas suffer from congestion, high automobile insurance and parking costs, lack of affordable housing, and an aggressive real estate market. This chapter establishes why Boston should adopt Smart Growth policies and implement them aggressively to resolve its problems from traditional growth. It applies the research I did regarding Boston's jobs-housing balance, the impact of parking on housing prices, parking appeal decisions and stakeholder perceptions to the attributes Boston already has to make a case for changing the way the city views and implements future development.

Boston's early development was founded on many of the principles employed by Smart Growth: mixed use, dense development, pedestrian accessibility, and public transit. Since these principles guided permanent infrastructure development for the city, most of their early influence has not been lost during the auto-oriented development period from 1920 through today. The city's auto-oriented infrastructure is limited by a 1973 parking freeze, geography of the city (peninsula), and the dense urban fabric that was established in the 19th and 20th centuries. The 1973 parking freeze capped general public use parking spaces at 35,500, which has worked well to curb excess growth in the city's parking supply (CTPS 2002). Boston's colonial history and status as having the first subway in the United States has led to the development of a high density urban core surrounded by dense urban neighborhoods. Boston and its surrounding areas have the unique advantage of possessing the basic infrastructure for Smart Growth and are in a good position to transition from traditional to Smart Growth.

[16] The Massachusetts Bay Transit Authority ranks as the 6th largest transit agency in the US (APTA 2002).

Of course, Boston has not escaped the pro-auto policies from the last eighty years. The annual congestion delay per traveler during the peak travel period[17] grew from approximately 13 hours per year in 1962 to 51 hours per year in 2003 (TTI 2005). In 2003, the total congestion cost for the greater Boston metropolitan area was $1.5 billion dollars (approximately $1,024 per traveler) (TTI 2005a). Auto registration was up 36% in Boston from 1990 to 2000, which translates into increased congestion and greater parking demand (CTPS 2002). In addition, data on the sale of houses in the GMA indicate a strong market for homes that include parking (see Table 5.1). These trends indicate Boston is negatively impacted by the traditional development and auto dependency.

Table 5.1 Types and Quantity of Parking Available with 2 & 3 Bedroom Houses Sold in the Greater Boston Metropolitan Area (GMA) from 1/2004 to 3/2005

Percent of Parking by Type for All Homes Sold (1/2004 and 3/2005)		
	2 Bedroom	3 Bedroom
Street	42%	35%
Garage	10%	27%
Deeded	13%	10%
None Listed	22%	16%
Other	14%	12%
Percent of Parking by Number of Spaces for All Homes Sold (1/2004 – 3/2005)		
	2 Bedroom	3 Bedroom
0 spaces	64%	48%
1 space	20%	32%
2 spaces	10%	12%
3+ spaces	6%	7%

Source: Listing Information Network, 2005
Note: 'Other' includes: possible, available, tandem, and rental; 2 bedroom: n=97, 3 bedroom: n=264
GMA includes Arlington, Beacon Hill, Brighton, Brookline, Cambridge, Charlestown, Dorchester, East Boston, Fenway, Hyde Park, Jamaica Plain, Mattapan, Milton, Mission Hill, North End, Randall, Revere, Roslindale, South Boston, South End, West Roxbury, and Watertown

The Job-Housing Balance

Job and housing location and accessibility are influenced by traditional development policies and provide insight into where and how Smart Growth needs to focus its development efforts. Table 5.2 provides data on the change in the number of jobs for Boston, Cambridge and Quincy

[17] Peak period refers to the morning and evening times when the number of travelers on the road spike due to commuters traveling to and from work.

from 1980 to 2000. Despite the parking freeze and high parking costs, Boston has the highest absolute number of jobs, accounting for nearly one-fifth of the state's total. But when the growth of jobs across the case cities are considered, Boston faces the lowest growth rate and is below the state average. The outward shift of jobs from the high density central business district (CBD) to lower density areas increases auto dependency and parking demand and is an indication of traditional growth patterns continuing to influence development around Boston.

Table 5.2 Employment Changes by City, 1980 – 2000

		Employment			Change		% Change	
Town Name		1980	1990	2000	1980-1990	1990-2000	1980-1990	1990-2000
Boston	Total	505,360	537,664	583,955	32,304	46,291	6.4%	8.6%
	Per mi^2	10,435	11,102	12,057	667	956		
Cambridge	Total	92,044	103,278	115,625	11,234	12,347	12.2%	12.0%
	Per mi^2	14,317	16,064	17,985	1,747	1,921		
Quincy	Total	34,109	39,938	47,227	5,829	7,289	17.1%	18.3%
	Per mi^2	2,032	2,380	2,814	347	434		
State Total		2,571,513	2,906,377	3,249,448	334,854	343,061	13.0%	11.8%

Source: Paul Reim, CTPS 2005; Boston area = 48.431 sq miles, Cambridge = 6.429 sq miles, Quincy = 16.783 sq miles

The parking problems associated with traditional development will continue to plague the GMA if current development patterns and job dispersion persist. Quincy Center has a high job growth rate accompanied by a minimum parking requirements that are relatively high. Previous research shows that such a combination leads to increasing vehicle miles traveled, more traffic congestion and a decreased quality of life (Kuzmyak 2003, Feigon et al 2003, Shoup 1995). Slower job growth in the CBD and high density areas could result in lower transit ridership and less investment in the system, which would further contribute to auto dependency. Transit service reductions would further limit the amount of housing available near transit and force more low income families to purchase cars in order to go to work.

Table 5.3 Jobs Available within 30 Minutes of Station by Travel Mode

	Walk	Transit*	Drive	% Jobs by Transit**
North Station	330,766	651,956	1,540,270	42%
Ruggles	155,399	560,601	1,440,303	39%
Quincy Center	31,922	90,437	1,248,830	7%
Alewife	30,104	271,506	1,340,849	20%

* Transit does not include the bus system and is therefore undercounting the number of jobs accessible within 30 minutes. Walking is a subset of transit, and transit is a subset of the jobs available by driving.
** Based on total jobs accessible by driving

With regard to accessibility, Table 5.3 illustrates the current dominance of the car that is facilitated by the expansive highway, road and parking infrastructure. It would be wrong to suggest that Boston ignore the usefulness of the car in accessing areas surrounding the CBD. While access to 1.5 million jobs via car improves the opportunity to find work, people usually have no more than one or two jobs at one time. The number of jobs available by transit in Boston (651,956) is adequate for most people to find work they can commute to via rail or bus.

When the information in Table 5.3 is combined with the visual representation in Figures 5.1-3, the advantage of transit is more obvious (Note: Figures 5.1 to 5.3 are the job access maps for North Station. Access maps for the other three case sites are in Appendix B). The area of access within 30 minutes from North Station for transit is less than one-quarter of the access area for driving from the same place. Transit provides access to 42% of the jobs that driving does in less than 25% of the geographical area. The jobs are not homogenously spread across the driving area, but concentrated along the transit system. Despite the traditional development paradigm driving growth in the Boston area, businesses appear to prefer locating near the central business district (CBD) and transit stations. The percent of driving jobs accessible by transit declines as the stations are located further from downtown Boston, which indicates the advantage of locating near the center of the transit line and the need to focus jobs and housing near the center of the transit system.

Figure 5.1 Job Access within 30 Minutes of North Station by Driving

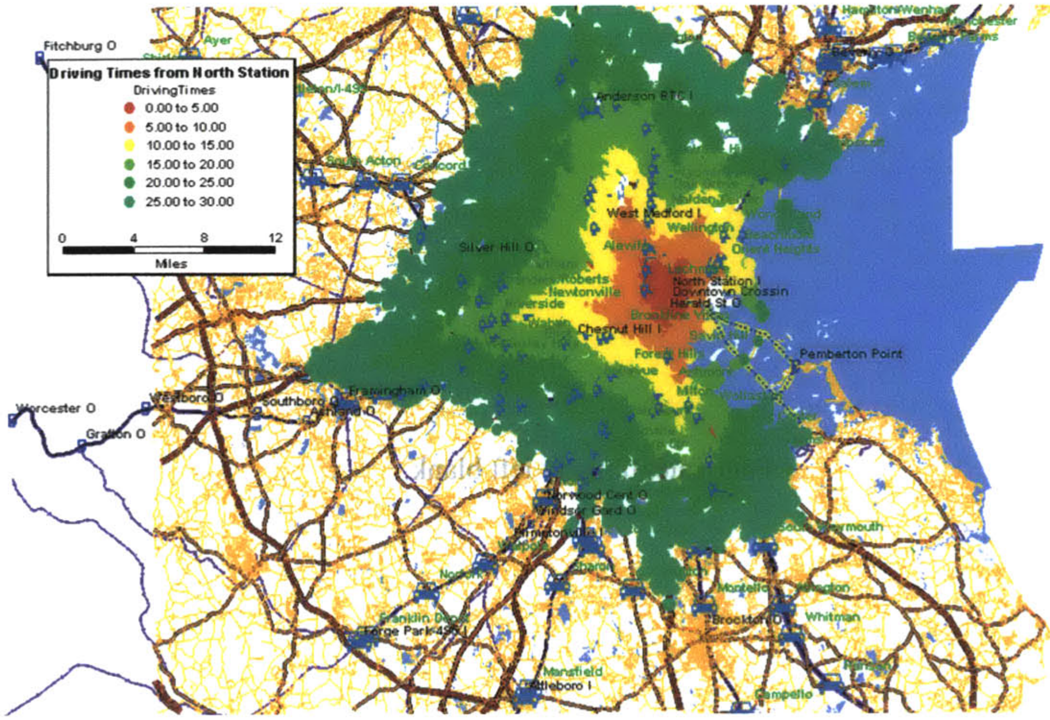
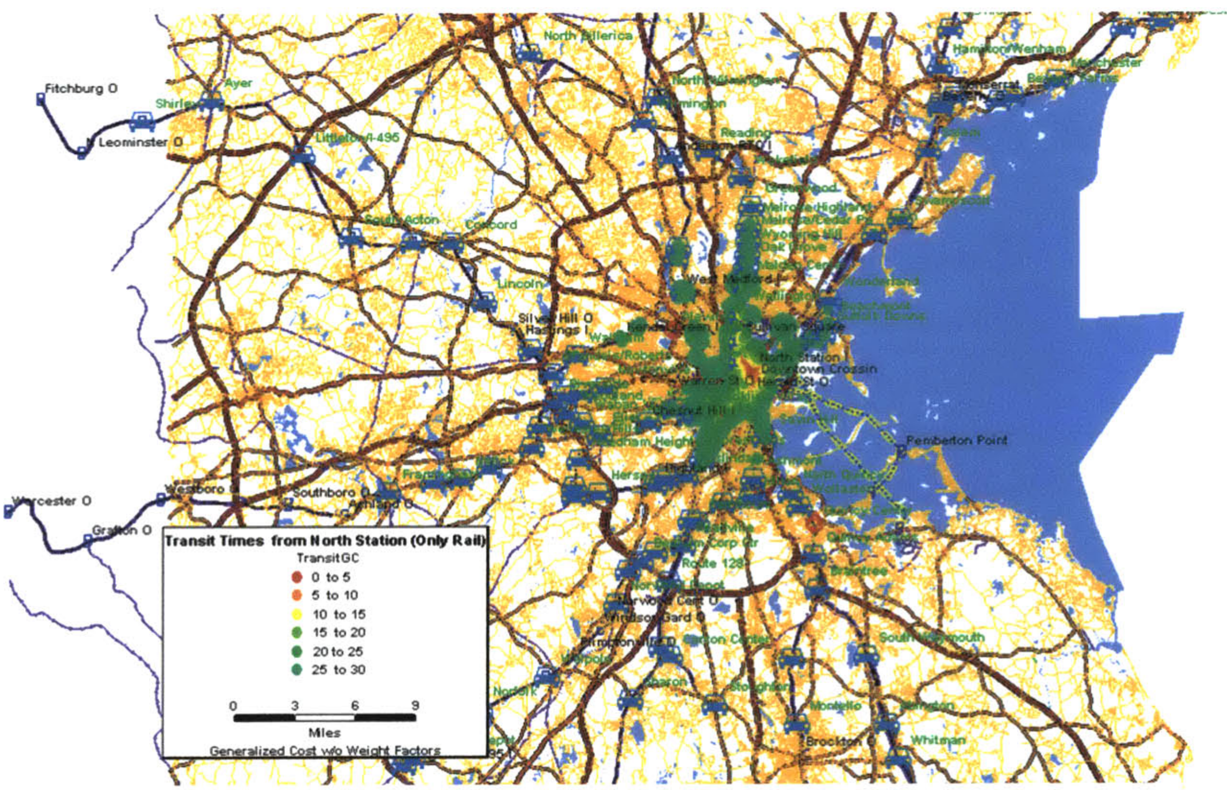


Figure 5.2 Job Access within 30 Minutes of North Station by Transit



Note: The transit system does not include bus services as the data was not available. The travel times for all modes do not include trips are costs (transit fares, parking fees, fuels costs, etc).

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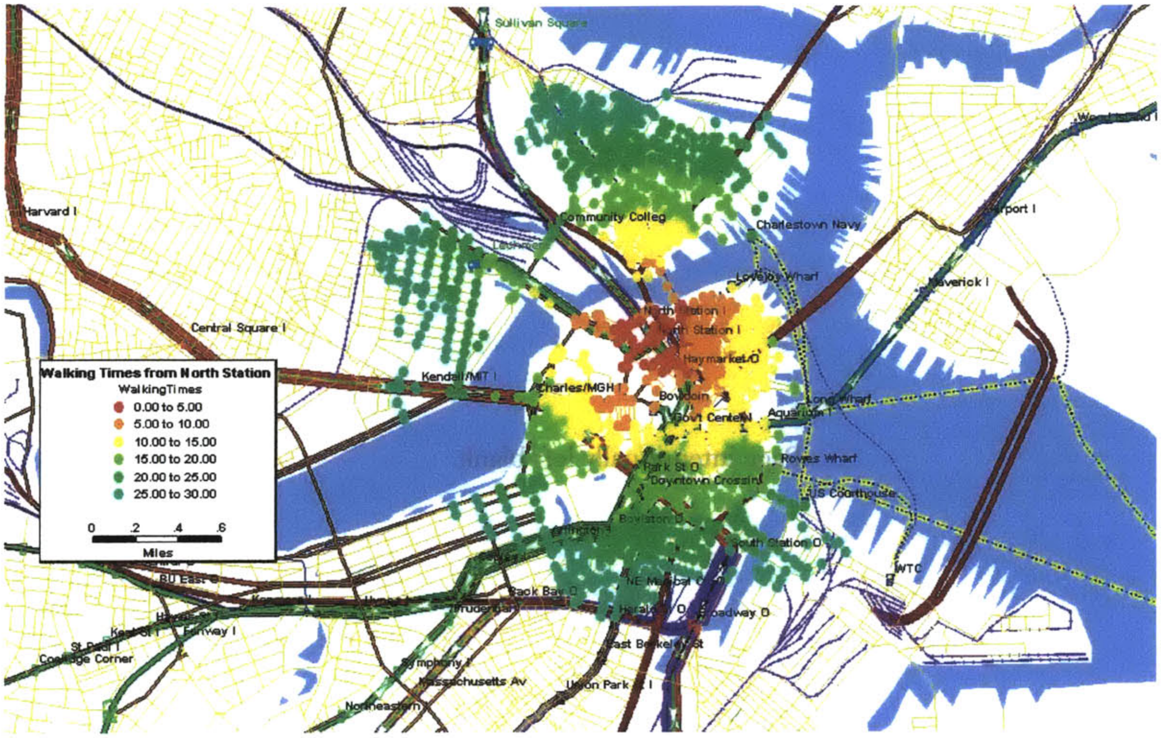
Figure 5.3 Job Access within 30 Minutes of North Station by Walking



Job accessibility can also be viewed as access to a larger workforce when companies are determining where to locate their offices. Again, the greatest pool of workers is associated with driving. While this makes Smart Growth and reduced auto-dependency seem like a sacrifice in terms of job and employee accessibility, there are other factors. to consider. Parking is expensive for employers to provide in downtown Boston. The city has ranked 12th in the country for the worst congestion delay from 2000 to 2003 and the amount of delay is increasing annually. Employees that travel to work via public transportation are more likely to arrive energetic and focused, rather than frustrated from waiting in rush hour traffic. Locating jobs near the stations with the largest 30 minute transit catchments opens the employers to a wider and potentially more productive employee market than locating in lower density suburbs where employees must drive to work in congestion.

According to Smart Growth objectives, concentrating job centers at the center of transit offers greater opportunities for job access and reduced auto dependency. Continuing to focus job

Page intentionally left blank.

opportunities near the stations improves non-automobile accessibility for a wide range of households and communities. The social cost of parking and auto dependency is also lowered by improving air quality, reducing transportation costs that are passed on to consumers, and savings on infrastructure expansion (Belzer and Autler 2002, Shoup 1995 & 2002).

The job accessibility implications of Smart Growth development for less dense areas also need to be considered. In looking at job accessibility for Quincy, reducing parking ratios without allowing more dense commercial and residential development in the zoning code would do very little to assist residents in gaining access to a greater number of jobs via pedestrian and transit trips. Alewife has less than half the job access via transit than North Station, though much more than Quincy. However, Alewife's lack of pedestrian-friendly environment is evident in its lower number of jobs available via walking than Quincy. This may mean a large number of the transit trips begin as car trips (park-and-ride or kiss-and-ride). Smart Growth policy to reduce parking ratios may further reduce transit and walking trips in Alewife. The Smart Growth parking policies must be coordinated with land use, street design, transit and other policies and efforts in order to truly improve access to jobs, create the opportunity for diverse communities, and generate more pedestrian and transit trips.

Table 5.4 Housing Units within 30 Minute Commute to North Station

	Housing Units
Transit	**151,999**
Drive	**872,240**
% within Transit Access	**17%**

In order for commuters to access work via transit, they must live within a reasonable distance from transit stations. Table 5.4 summarizes the number of households with 30 minute access to North Station via driving and transit.[18] Transit only serves 17% of the housing stock

[18] Housing unit supply was only calculated for North Station due to time constraints. Regional analysis should be done in the future.

accessible to the same location by car. The total trip time from home to work on transit should not be longer than an average commute by car, which has been assumed to be 30 minutes for this research. Otherwise, the incentive to take transit rather than driving is diminished. Transit in this context refers primarily to rail transit since it is more advantageous than bus for traveling to the CBD. Bus travel times are sensitive to congestion and less reliable than rail transit. Of course, feeder bus service to transit stations is an important link between residential areas and transit stations.

The transit time includes the walking time to the station from home, as well as the walking time to the office from North Station. Essentially this means that stations further from the center of the transit system have smaller areas in which a resident can commute from home to North Station in thirty minutes. Figure 5.2 illustrates this phenomenon as the stations farthest to the north, west and south have the smallest catchment areas.

Housing Costs

Parking and housing price are intricately linked and pose a greater burden on low income families. Traditional development encourages auto-dependency that leads to a demand pull for housing with parking, which results in increased willingness to pay and higher housing prices. Smart Growth principles advocate for affordable housing located near transit service in order to provide more equitable job access for lower income families without cars. While job accessibility via transit is important, if affordable housing is not located within a reasonable walking distance from public transportation, most people will have to drive to work or lose the opportunity work at a number of jobs. According to Jia and Wachs, "Parking spaces add significantly to the cost of building houses, thus raising their sales prices or monthly rents." (1998, pg 23) Their research indicates that off-street parking can increase the purchase price of a house or condo by approximately 12% and 13% respectively. Such a difference in price can greatly alter the number of households able to afford housing. Jia and Wachs estimated 24% more households could afford houses if parking were *not* included; 20% more could afford condos without parking spaces (1998). When you add the cost of owning a car in this way, parking supply becomes a social equity issue.

A preliminary analysis of average selling prices for condos and houses across the greater Boston metropolitan area (GMA) was performed to get a sense of how much parking adds to the price of a home.[19] The results reveal a substantial increase in housing prices when off-street parking is bundled with the unit. As expected, the average selling price for both street and off-street parking increased as the number of bedrooms increased. The housing prices also increased with higher density and proximity to downtown Boston, which was also expected. The sale prices reflect supply and demand for housing and parking in Boston, though the differences in selling prices analyzed here may not indicate the construction costs of parking so much as the increased price the developer gains from providing off-street parking, thereby attracting more affluent buyers.

Tables 5.5 and 5.6 summarize the average selling prices for homes ranging from studios/lofts to three bedroom houses in neighborhoods within or close proximity to the case study sites (full data tables including maximum, minimum and median prices are in Appendix C). The greatest differences in selling prices between units with and without off-street parking were in high density locations near downtown Boston. Roxbury and Quincy were found to have the lowest housing prices of the case sites. Roxbury exhibited the smallest increase in housing prices when an off-street parking space was included with the unit ($22,000 to $86,000). While Quincy appears to be of the most affordable of those considered, it has less access to jobs and services by transit than the neighborhoods closer to downtown Boston (see Table 5.3 in previous section). In order for low to middle income households to live in Quincy, it is necessary to have an automobile available. In

[19] The analysis held constant the number of bedrooms and whether the unit was a condo or house. Further analysis needs to be done to account for the impact of square footage, age, and amenities of the unit on selling price.

addition to the selling price data, long-time Boston realtor Alan Fincke of Coldwell Banker was consulted regarding parking prices in Boston. In his experience, the average difference in selling prices for similar condos with and without parking is $50,000 for the South End; $60,000 for Back Bay; and $80,000 for Beacon Hill. Fincke also stated that rental prices for parking in these neighborhoods range from $300-400 per month (2005). The net present value for these monthly rental prices are in Table 5.7.

Table 5.5 Range of Selling Prices by Size and Location†

	Range for All Areas (Street)			Range (Off-Street)			Largest Difference Between Street & Off-Street	Smallest Difference Between Street & Off-Street
	High	Low	Std Dev	High	Low	Std Dev		
Studio/Loft n=193	$485,410 Midtown	$189,751 Fenway	$95,036	$537,131 South End	$208,100 Fenway	$111,413	South End	Midtown
1 Bedroom Condo, n=1,137	$402,313 Midtown	$199,000 Roxbury	$123,780	$532,519 South End	$180,000 Quincy*	$119,558	North End	Fenway
2 Bedroom Condo, n=1,417	$753,533 Midtown	$260,667 Roxbury	$210,049	$940,180 Beacon Hill	$347,500 Roxbury	$242,568	North End	South Boston
3 Bedroom Condo, n=300	$1,114,399 Midtown	$344,000 Roxbury	$308,333	$1,806,000 Beacon Hill	$366,091 Roxbury	$547,868	Beacon Hill	South Boston
2 Bedroom House, n=50	$1,105,000 Beacon Hill	$359,611 SBoston	$380,487	$1,059,677 South End	$377,688 SBoston	$288,941	South End**	South Boston**
3 Bedroom House, n=91	$1,533,500 Beacon Hill	$428,016 SBoston	$444,169	$1,565,000 Beacon Hill	$340,000 Quincy	$481,274	Cambridge	Beacon Hill

* Quincy only had 1 listing for a one bedroom condo and, therefore, does not offer a large enough sample size.
** South End and South Boston were the only two locations with adequate data for 2 bedroom houses.
† Data for 2 and 3 bedroom houses were limited (sample size of 50), most likely due to a limited supply of this housing type close to the city. There were no listings for Midtown, Fenway and the North End. Most other locations only had 1 or 2 sales, which make the data analysis less reliable. The exception was South Boston, where there seems to be a larger supply of individual homes rather than condos.

Table 5.6 Comparison of Selling Prices for 3 Bedroom Condos Sold With and Without Off-Street Parking from 1/2004 – 3/2005 (n= 300)

	Street Parking			**Off-Street Parking**			
City	n (street)	Average Selling Price	Median Price	n(off)	Average Selling Price	Median Price	**Difference Between Average Selling Prices**
Beacon Hill	18	1,089,167	1,037,500	5	1,806,000	1,770,000	**$716,833**
Cambridge	7	$446,571	$435,000	18	$761,912	$750,000	**$315,340**
Fenway	8	$417,750	$400,000	1	$612,500	$612,500	**$194,750**
Midtown	14	1,114,399	$642,500	14	1,525,729	1,552,000	**$411,330**
North End	4	$494,750	$446,000	1	1,500,000	1,500,000	**$1,005,250**
Quincy	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**
Roxbury	3	$344,000	$279,000	11	$366,091	$379,000	**$22,091**
South Boston	90	$425,130	$415,000	32	$440,234	$444,250	**$15,104**
South End	31	$630,917	$549,000	43	1,061,197	$982,200	**$430,279**
	Standard Deviation		$308,333		Standard Deviation		$547,868

Source: Listing Information Network
Note: It was assumed that an unspecified type of space referred to no off-street parking available with the unit. Hence, the average selling price for street parking includes both the number of spaces not specified and the number listed as "street." No listing of 3 bedroom condo sales appeared for Quincy.

Table 5.7 Net Present Value of Parking Space Rental Over 25 Years

Discount Rate	3%	5%
$300 per month	$62,687.33	$50,738.20
$400 per month	$83,583.11	$67,650.93

The additional price for off-street parking with housing in transit accessible Boston neighborhoods is substantial and may well deter middle to low income families from living close to the city where access to jobs is greater by all modes. Since the housing prices are lowest in areas farthest from downtown Boston, middle to low income families must choose between a much higher mortgage to live in close proximity to downtown Boston with greater job access via transit, and a slightly lower mortgage in Quincy plus the added expenses are car ownership and parking in order to access more jobs. The housing price analysis reveals the expense of living near transit is high, but the cost of car ownership also adds substantially to the household's financial burden, especially for lower income families (Public Policy Institute 2005). They are unable to break the unsustainable cycle of auto dependency and lack of discretionary funds for other necessities, such as health care and education (TCRP 1999). The choice between urban and suburban living has a great impact on the types of jobs available to these households and their future financial success.

Smart Growth development helps middle and low income households by concentrating development near transit, eliminating unnecessary parking requirements that drive up housing prices, and providing housing across a wide range of prices. The latter is not occurring on a wide scale in Boston. Rather, auto-dependency, which is perpetuated by traditional growth policies, is creating high demand for urban housing with parking spaces that increases housing prices and reduces the housing stock without off-street parking which, according to the research, is more affordable.

Parking Appeals: Developer Demands & Community Response

The housing price data suggests that the majority of parking appeals from developers should be for more parking due to the demand pull and profitability from providing it. The appeals research instead uncovers a split between requests for increases and decreases in parking, as well as a division in community response. The parking appeals review revealed that the majority of appeals in Boston are for parking spaces above the ordinance suggested amount, and the majority of requests in Cambridge and Quincy are for fewer spaces than recommended. Tables 5.8 and 5.9 summarize the total number of appeals reviewed and the amount that were for increases and decreases in parking beyond the cities' parking ordinances. When developers requested more parking than required, Boston and Quincy approved more than half of the appeals (74% and 67% respectively); Cambridge approved 50%. When developers requested less parking than recommended, Cambridge and Quincy approved 79% and 73% respectively. Tables with full detail on each case reviewed are in Appendix E.

Table 5.8 Summary of Appeals to Provide MORE than Parking Ordinance Lists

	# Cases	Increase Requests	Decision	Community Response
Boston	20	19	approved:14 denied:5	N/A*
Cambridge	19	4	approved:2 denied:2	none:3 oppose:1
Quincy	14	3	approved:2 denied:1	none:1 oppose:2

Note: Cambridge community response: For 1 increase request counted as no community response, the community was consulted prior to the appeal and a solution worked out. One Boston case was a renewal of a current permit.
* The Boston Zoning Board of Appeals requires developers to consult with the community prior to the Board hearing the case. Hence, there is no data for community response in the Boston hearing information.

Table 5.9 Summary of Appeals to Provide LESS than Parking Ordinance Lists

	# Cases	Decrease Requests	Decision	Community Response
Boston	20	None	N/A	N/A
Cambridge	19	14	approved:11 denied:3	none:7 oppose:7
Quincy	14	11	approved:8 denied:3	none:8 oppose:3

Note: Cambridge community response: For 1 decrease requests counted as no community response, the community was consulted prior to the appeal and a solution worked out.

The Boston appeals data indicate that the newly formulated parking ratios suggested by the Boston Transportation Department are low enough to support Smart Growth. They challenge the traditional policies developers are familiar with and make a profit from. The developers are responding with appeals to continue providing more parking. Unfortunately, the Boston parking ratios are not touted as hard rules and are not being implemented as such. There are no data in the appeals regarding community opposition, so no conclusion can be drawn regarding Boston communities. Cambridge also adopted lower parking ratios, but is not experiencing the same backlash from developers. The city is standing by the new ratios: it only approved 50% of the requests for more parking and approved 79% of the requests for even less parking. Quincy is less divided between parking increases and decreases; approvals for both requests were approved more than 65% of the time.

The community position regarding parking varies by case and location and no discernable trend was found. The reasons listed for community opposition to increases in the amount of parking include: increased traffic, parking concerns (not specified), loss of drainage capacity, need for off-street parking, and size of the parking lot. The reasons for community opposition to decreases in the amount of parking include: current shortage of parking (appeared in several different cases, referred to as "parking disaster"), increased traffic and competition for street parking, loss of protected residential rights, loss of property value, pedestrian and road safety concerns, drainage issues (not specified), objections to increase in density (1 particular case), and transit use not justifiable to reduce parking requirement. While the cases specified community objections to the developer's proposals, it was not clear whether the Board's decision to grant or deny the appeal was largely influenced by the communities' participation. Additionally, several of the decisions that were granted included conditional changes to the amount of parking provided.

Despite some complicated factors, the research found a few apparent patterns: there was more community opposition to decreasing parking in Cambridge than Quincy (50% and 25% respectively); more community opposition to increasing parking in Quincy than in Cambridge (63% and ~25%). While no direct link can be established between community opposition and denial of parking appeals, the clear trends regarding location and type can be useful in determining community attitudes toward parking and potentially their perception of Smart Growth.

Stakeholder Perceptions from Interviews

Stakeholder groups play an integral role in shifting from traditional to Smart Growth. By understanding the point of view for each stakeholder group, decision-makers learn where support can be found and how to negotiate an agreement with those who oppose various policy suggestions. Interviews are the most direct method for determining how a person perceives Boston's parking situation and Smart Growth and what position they are likely to take. Planners, developers, lenders and community representatives were interviewed in order to determine where they stand and what their perceptions are regarding traditional development, parking problems and future development in Boston. Table 5.10 lists those interviewed. The full responses to each question for each group are located in Appendix E.

Table 5.10 Interviewed Stakeholders

Stakeholder Group	Interviewee	Organization	Date
Planner	Bryan Glascock	Boston Dept of Environment	March 15, 2005
	Vineet Gupta	Boston Transportation Department	March 31, 2005
	Catherine Preston	Cambridge Planning Department	March 2, 2005
Developer	Byron Gilchrest	Gilchrest Associates	March 1, 2005
	Peter Nichols	Beal Company	March 24, 2005
	Ted Raymond	Raymond	March 21, 2005
	David Begelfer	National Assoc Industrial & Office Properties	March 21, 2005
Lenders	Jim Meleones	Bank of America, North Carolina	March 15, 2005
	Kevin Boyle	Citizens Bank	April 5, 2005
Community	Lucy Edmondson	EPA Region 1	March 3, 2005
	Shirley Kressle	local activist	March 17, 2005
	Marc Laderman	Fenway CDC Board President	April 12, 2005

The primary finding from the interviews is the difference in perception of Smart Growth for each stakeholder group. The planners view Smart Growth in essentially the same way it has been presented in this thesis; however, they are more sensitive to potential economic implications if Smart Growth is less successful than traditional development. On the other hand, most developers and lenders saw no problem with providing parking in high density areas near transit because not everyone takes public transportation. There is a market demand for parking that needs to be filled. While all of the community representatives felt their community supported Smart Growth principles, each had varying ideas regarding what that meant. With regard to Smart Growth parking, one stated there was too much parking for the middle and upper class but not the lower income families; another felt the parking freeze maintained the right amount of parking; the third suggested the lower the ratio the better since it gives the community leverage to demand more transit capacity and other city services. As planning decisions are made through public participation, these different perceptions of desirable and Smart Growth can make it difficult to agree on parking levels, as well as implement them.

The other important conclusion from the interviews involves the extent to which developers, lenders and communities act as obstacles to Smart Growth. The general consensus was that the real estate market acts as the greatest hurdle for Smart Growth to overcome. The perceptions were that demand for housing with off-street parking inflates housing prices and this demand needed to be filled. Additionally, actors in the real estate market have narrow interests of profit maximization and do not perceive themselves as successful with Smart Growth development. Even the planners stated that housing units would not sell without off-street parking. These statements reveal the idea that "the market" is unchangeable and must be treated as an independent object that is not related to government policies and incentives. However, as discussed in Chapter 2, the current real estate market is largely the product of pro-automobile and low-density policies since 1920. This perception that the market is immutable seriously challenges the extent to which Smart Growth can be implemented and successful. Communities were also found to challenge reduced parking ratios as part of Smart Growth policy. The split between the desire for more parking to reduce competition and less parking to preserve neighborhood character reduces the degree to which communities block Smart Growth, especially when compared to market perceptions held by developers and lenders. A common theme from the interviews regarding community opposition was the need for outreach to the community and education regarding the impacts of parking and higher density development.

Is Smart Growth Smart for Boston?

If there is any city in the U.S. that has the infrastructure and density in place to implement Smart Growth, it is the greater Boston metropolitan area. The city is also very much in need of Smart Growth development. While the concentration of jobs in the city and available by transit and walking already exemplifies Smart Growth principles, there is a significant gap in affordable housing for transit accessible areas. While the city has demonstrated incredible political will for shifting to Smart Growth in its recent overhaul of parking regulations, the notion that these are suggestions for developers to follow severely weakens their impact on actually reducing parking. And finally, Boston has many intelligent stakeholders interested in making the city better, but their perceptions and motivations for how to do it may prove to be more of a hindrance than a help. Boston certainly has the capacity to shift from traditional to Smart Growth, as well as a head start in getting there from transit services and historic high density. What is needed is a comprehensive plan of action to be developed and implemented by strong leaders that are willing to risk altering the traditional real estate market to better the city in the long run.

CHAPTER 6: CONCLUSIONS & RECOMMENDATIONS

Dittmar and Ohland list obstacles to Smart Growth and TOD as excessive free parking, low quality pedestrian environments, inadequate public transportation, imbalanced land uses, poor or missing transit links between residential and employment areas, and traditional zoning methods (2004, 124-5). The research from this thesis indicates that Boston is well ahead of the game in adopting and implementing Smart Growth. The city has the reputation for being pedestrian friendly, as well as home to the sixth largest public transportation system in the country. The land uses are fairly well mixed downtown and along some major transit corridors and the links between residential and employment areas are average. The critical factors the city needs to change in order to implement Smart Growth include: disconnect between stakeholder perceptions of Smart Growth and the real estate market (stakeholders do not perceive themselves as 'winners' with Smart Growth), lack of affordable housing near transit, lack of enforcement for Smart Growth-oriented policies, increased transit capacity to handle future growth, and a more coordinated set of policies for housing, transportation, and economic growth that is centered around Smart Growth that a rigorously implemented and adhered to. The following recommendations for pursuing Smart Growth in the greater Boston metropolitan area are based on the research and these conclusions.

Recommendations to Implement Smart Growth Parking Policies

The advantages of higher density Smart Growth development cannot be realized without coordinating transportation planning and parking regulations to support and encourage land use changes, and without open dialogue among stakeholders. The greater Boston metropolitan area is in a relatively good position to implement long-term Smart Growth development plans. The recently revised parking regulations in Boston and Cambridge provide a solid base for shifting from traditional auto-oriented growth to denser, transit-oriented growth. Based on the GIS and census analysis, housing market analysis, stakeholder interviews, and review of zoning appeals, the following recommendation are suggested to zoning regulators and developers in the greater Boston metropolitan area.

Establish a clear mandate for Smart Growth that holds each stakeholder responsible for improving the Commonwealth by moving away from auto-oriented low density development. Under traditional growth principles, actors pursue their own self interest, which often results in a 'tragedy of the commons.' By establishing clear objectives and guidelines for Smart Growth and ensuring they are implemented, the city attaches responsibility to individuals for community health and livability in a way not done before. It will no longer be acceptable to develop the city in a self-interested way that profits the few and puts many at a disadvantage, especially regarding housing and job accessibility.

Continue to focus jobs centers near transit and commuter rail stations, especially those in already dense areas. The TransCAD analysis of each case study station indicates a concentration of jobs around the stations. The transit accessibility of those stations closer to downtown Boston (North Station and Ruggles) is greater than those farther out in less dense areas (Quincy Center and Alewife). By encouraging employers to locate near transit stations, the likelihood of employees using transit rises and peak period congestion is reduced. The visuals and statistics of potential employees should be used by the city to attract new businesses to the area and build awareness regarding the importance of transit ridership and high density development.

Increase housing opportunities near transit stations. Boston lacks an adequate supply of housing near transit as indicated by the bar chart and mode split maps in Chapter 4 and Table 5.4 in Chapter 5. In order for workers to choose public transportation or walking to commute to work, the trip must be convenient and comfortable. They must be able to live in an area within a short walk to work, that is served by transit, or at least has access to a park-and-ride facility that will make transit feasible. Mixing residential and commercial developments that offer employment and services encourages pedestrian trips and reduces reliance on the automobile. The transit and pedestrian mode splits for downtown Boston are reasonably high compared to other U.S. cities. However, there is plenty of room to improve the mode split along transit lines further from Boston's CBD.

Implement a location efficiency mortgage program in high density communities near transit to provide more affordable housing with adequate public transportation options. It is not enough for more housing units to be built near transit stations, especially if the majority of them are high-end luxury units. It was clearly demonstrated that housing prices in areas well served by transit are high and require a greater proportion of household income for lower income families than higher income families. Location efficient mortgages (LEM) work to make transit-accessible housing available to lower income families by making them eligible for mortgages they would otherwise be denied. The basic premise for the program is that living near transit reduces the need for a car and the income saved by not owning a car (or owning fewer) translates into a greater ability to pay a mortgage without default. A successful LEM program explicitly requires fewer vehicles per household (thus less parking) in order to remove the financial burden of owning a vehicle and paying to park, which reduces the risk of overextending the household income. Therefore, lower income families can get a mortgage they can afford in a transit accessible area and break the cycle of auto-dependency and auto-ownership costs (see Koffman 2003 for more information on the specifics of LEM).

Create a strong program to increase transit capacity and quality service that will be an adequate alternative to driving as parking requirements are lowered. Jobs and housing will be sustained near public transportation only if the transit has high capacity and service is safe and reliable. Business owners and residents have both indicated the need for better transit services, especially if parking is to be limited. The availability of transportation alternatives to the automobile is critical to a successful shift from traditional car-oriented development. There are a series of MBTA expansion projects that are required under an agreement with the Conservation Law Foundation as a result of the Central Artery project. While budget funding has prevented many of these projects from being implemented, renewed interest in expanded services creates an environment of support and potential political will. More important than capital expansion of the system is improving the operations; one way may be to get the MBTA to agree to a set frequency of service for bus and rail. By combining more reliable and frequent transit service with an LEM program that shifts auto costs into housing assets, the MBTA ridership should increase while private auto expenditure declines. Congestion should decline as well and individual well being would rise, making the policy (and necessary MBTA subsidy) more politically feasible.

Allow shared parking facilities wherever available to reduce the amount of land dedicated to parking and encourage car sharing to reduce the number of vehicles owned per household and reduce parking demand for residential areas. Several zoning appeals cases from Cambridge and Quincy included conditions of shared parking in their agreements. By allowing complimentary land uses to share parking facilities, the overall amount of land used as parking can be reduced and the spaces already in existence will be used more effectively. At the same time, mixed use facilities should develop a way to separate users so that residents do not spill over into commercial parking and vice versa. The shared spaces should be between businesses with off-set hours of operation.

The greater Boston metropolitan area is fortunate to already have a car-sharing company established in the region, with approximately 225 cars in the region. According to Zipcar, car sharing reduces individual driving by 50% and replaces between 7 and 10 private vehicles (Zipcar 2005). The program reduces parking demand and eliminates additional vehicle miles from looking for parking by having reserved spaces located throughout the community. Similar to shared parking, it is a program that lends itself to efficient resource use and distribution.

Include transit and car sharing incentives in mortgages for homes near transit. Incentives for households near transit stations to use transit or car sharing should be introduced into a mortgage program. In the same way a bank pays property taxes out from a mortgage payment, a subway pass (or two) could be included in a monthly mortgage payment to encourage transit use. Since the pass would be included in the mortgage whether it is used or not, most families would have the incentive to use it rather than waste money. Adding an annual car sharing membership to a monthly mortgage would add minimally to the total monthly payment and provide the household with car access it would otherwise be too expensive to own. In Boston, Zipcar costs $75 ($6.25 per month) for the first year of membership and $50 ($4.16 per month) each year after; gas and insurance are included in the hourly rate to use the car, which ranges from $8.50 to $10.50. This program would work particularly well with reduced parking ratios in dense urban areas.

Coordinate park-and-ride opportunities while reducing parking ratios near transit stations on a region wide basis to encourage adoption of transit-oriented policies in local municipalities. As mentioned before, Boston and Cambridge have adopted new Smart-Growth oriented parking regulations that are based on highway capacity, land uses, and transit access. However, a majority of the people working in Boston and Cambridge do not reside in these cities. In order to shift as a region from traditional growth to Smart Growth and TOD, cities along the transit corridors need to be coordinated in the amount of parking each provides for park-and-ride commuters. Additionally, development near these transit stations should encourage TOD by shifting the parking requirements from minimums to maximums for non-park-and-ride facilities, or remove the parking requirement altogether. Allowing the market to determine the amount of parking may produce more parking than Smart Growth policy, but less than the government's suggested amount (of course, this action needs further study). This will encourage pedestrian activity and transit use around their stations. (see Sorensen 2005 for additional details and analysis regarding park-and-ride facilities).

Rethink how parking is distributed in communities. One parking scheme offered by Robin Chase, founder and former CEO of Zipcar, is to centrally locate parking rather than allocate it to each building. By placing parking at regular intervals (four blocks, for instance), all drivers would need to spend a portion of every trip as a pedestrian and interact with the community. The number of curb cuts would be reduced, further improving the pedestrian environment. The number of car trips for local errands would be reduced (why walk four blocks to the car when the store is only four blocks away due to high density mixed use development?). Additionally, the automobile and parking would be lessened as a status symbol for wealth and class since everyone would be a pedestrian and interact with others on the street for at least a portion of their daily trips. While this scheme requires more research and consideration, it is an indication that there are innovative ways to change the parking system to be more in line with Smart Growth and livable communities.

Consider pricing schemes, including parking cash out programs that place parking at a market rate to discourage unnecessary auto trips. Much of the literature reviewed cited free parking a major advantage for driving. Communities pay the costs of providing parking, while drivers frequently do not. It is a tragedy of the concrete commons in a way. One way generate revenue and limit demand could be to re-bid parking spaces every two years. The city can capture rising land values that can and should be earmarked to transit and pedestrian improvements.

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Appendix A: Research Methods

RESEARCH METHODS

Several research methods were used to answer the thesis questions. GIS and census data were used in TransCAD software to determine the demographic, housing and job situation for each case study site. Parking inventory information was provided by the cities when available. Employment data from Central Transportation Planning Staff (CTPS) were used to estimate the number of jobs available within a 30 minute travel time from the case sites by automobile. Total jobs available by 30 minute journey via public transit and walking were determined using TransCAD as well. A qualitative analysis of parking appeals was performed using hearing information from each city's Zoning Board of Appeals in attempt to gauge the degree to which communities opposed changing parking policy. Finally, interviews with key stakeholders in transportation planning were used to determine the preferences and tendencies for parking demand, as well as other information.

TransCAD: GIS & Census Data

The Massachusetts Institute of Technology's Center for Transportation and Logistics has been developing a transportation model of Boston using the TransCAD software program. This software maps various transit modes and uses census and transportation data to determine traffic patterns, travel times and other types of transportation related measures. For this research, the model was used to identify the census block groups within one-half mile of each of the four case study sites. Population density, household density, job density and estimated travel times by auto, transit and walking were also mapped.

In order to determine which block groups were located at least partially within one-half mile of each site, the ruler and selection tools were used to select the group of block groups. These were saved and labeled according to distance and station. The desired data from Census 2000 and CTPP-2 were then used to structure the table of information that would be generated for each site. Table 1 identifies which categories of census data were selected and used to determine the above mentioned measures. The categories in Table 4.1 were combined for block groups one-half mile from case study sites using the overlay function in TransCAD. Formula fields were added in order to determine the values for population, housing and job densities.

Table 1 Census Categories Used for TransCAD Analysis

Source of Information	Category	Data
2000 Census	ID	reference
	Area	various densities
	Block Group	reference
	Population	population density
	Households	housing density
	Density	population density
CTPP-2 Data	ID	Reference
	Time arriving to work	jobs available, job density

Several sets of maps were generated using various TransCAD functions. The first set of maps use pie charts to identify the mode split for trips from home to work for each case study station. The second set of maps use bar charts to compare the number of jobs, population density and housing density in the areas surround each case study station. The employment data is courtesy of Paul Reim at CTPS and is summarized in Table 5.2 in Chapter 5. It is organized by traffic analysis zone (TAZ), which are larger than block groups and may contain only portions of block groups. Time constraints prevented the author from merging the data into the same set of points. Rather, the TAZ data was determined by centroid (the center of a TAZ) and the block groups were organized by node. The resulting maps are Figures 4.1 through 4.8 in Chapter 4. Maps for the other case sites are in Appendix B. These visuals facilitate comparing the population and housing density to the number of jobs available in each area.

A third set of maps were developed to indicate the accessibility within 30 minutes from each case study station via walking, driving, or transit. It is important to note that the transit layer does not yet include the bus system, and is therefore under-represented in terms of geographic reach. Creating the maps involved a several step process that included selecting the stations for analysis, defining the street network, connecting the points to the network, joining travel time matrices to the node layer data view, and differentiating the travel times by color to create cordons around the station by mode travel time (this is an extremely simplified explanation of the process). The process for generating transit travel times is different from the process for walk and drive times. The transit times usually involve weighting various factors such as in-vehicle time and waiting time. Since the point of this exercise is to demonstrate actual time instead of perceived time, all the weights were set at 1. The resulting maps for North Station are Figures 5.1 through 5.3 in Chapter 5 and maps for the remaining case sites are in Appendix B.

The employment data were applied to the travel time maps to determine job access via walking, transit, and driving for each case study site. This data was compiled by joining census data (nodes) with the employment data in the TAZs. Once the data was compiled in TransCAD, it was exported to MS Excel for calculation and organizations. The results are provided in Table 5.3. A calculation of housing units accessible by driving and transit was performed using the overlay function in TransCAD to combine travel time data with census data on housing units. The results are lists in Table 5.4.

Housing Costs

The purpose of looking at the selling price differences between homes with and without parking was to get a preliminary understanding of how much parking contributes to housing prices in various Boston locations. Real estate data from the Listing Information Network were provided by Marilyn Jackson at Boston Homes. The data included selling price, address and type of home, square footage, number of bedrooms, number of bathrooms, parking number and type, and closing date for all home purchase (houses and condos) for the greater Boston metropolitan area from January 2004 through March 2005. The regional data were analyzed to determine the total percentage of homes sold with parking spaces and the percentage of homes sold with 0, 1, 2, and 3+ parking spaces. This was done by summing the total number of sales that fell into each category (type of parking or number of spaces) and divided by the total number homes sold. Houses and condos were determined separately. This information is summarized in Table 2.4 and 2.5 in Chapter 2.

The data were then limited to areas that contain the case study station or are in close proximity to the station. Table 2 details which Boston neighborhoods were associated with each case study site. The real estate data were divided into studio/lofts, 1 bedroom condos, 2 bedroom condos, 3 bedroom condos, 2 bedroom houses, and 3 bedroom houses and limited to 0 or 1 parking space (including more than 1 parking space increased the price of the home significantly and would have skewed the data to show parking to be much more expensive). Unspecified parking and street parking were counted as zero spaces or sold without parking. Deeded, garage and other similar descriptions were counted as sold with parking. Rental available or available at an additional cost were not included. Once the data were sorted by location, number of bedrooms and specified as with or without parking, the average selling price for each neighborhood was calculated. The average selling price for units sold without parking was subtracted from the average selling price for units sold with parking; the resulting number was labeled as "difference between average selling prices." Additionally, the minimum, maximum and median selling prices were determined; the standard deviation in sales prices for all neighborhoods was determined for both units sold without parking and with parking. The detailed tables are in Appendix D and the summary tables are in Chapter 4. Additional data analysis should be done that holds constant other factors that contribute to housing price (square feet, renovation, porches and other amenities) in order to isolate the effect parking has on price.

Table 2 Boston Neighborhoods Considered by Case Study Station

Case Study Station	Boston Neighborhood
North Station	North End
	Beacon Hill
	Midtown
Ruggles	Fenway
	Roxbury
	South End
Quincy Center	Quincy
Alewife	Cambridge

Zoning Board of Appeals Data

In effort to gauge community opposition to changes in the parking supply provided by development projects, a sample of zoning appeals was reviewed. Due to filing methods by each city (by specific street address) and time constraints for the city administrators and author, it was not possible to find a sample of data limited to the half-mile distance from each case study station. Rather, a sample of data from the entire city was considered for each Boston (n=20), Cambridge (n=19), and Quincy (n=14).

The Boston Zoning Board of Appeals (ZBA) and the Boston Redevelopment Authority (BRA) were both contacted to gain access to the hearing notes for the parking appeals submitted in Boston. The BRA did not have such files and the ZBA only documents the file by specific street address. Selecting only the appeals that dealt with parking would have required reviewing every appeal filed over the last year. Through the interview and discussion with Vineet Gupta at the Boston Transportation Department (BTD), the data on parking appeals were provided to the author by Bob D'Amico of the BTD, who represents the department at the ZBA hearings. While the author was not able to personally review the hearing files, the data provided by Mr. D'Amico provided enough information to be comparable to the Cambridge and Quincy data (see the findings in Chapter 4 for greater detail).

In order to review the appeals data for Quincy and Cambridge, the Quincy Department of Inspectional Services and the Cambridge Board of Zoning Appeals (within the Inspectional Services Department) were contacted to set up appointments to look at the files since they may not be removed from the premises. The Quincy zoning appeals data were collected on two separate occasions. Due to the time demand on the Quincy staff, the author limited the sample size to 14. Twenty cases were identified, but several turned out to be related and one was not located. Based on the cases provided, Cambridge averages approximately ten parking appeals per year. The author selected five cases from four different years for the sample in attempt to capture any shifts in attitude toward parking by the Board and the community.

For each file reviewed, the case number, type of request (increase or decrease in parking from the zoning ordinance), decision, note or mention of community opposition to the action, and any reasons for opposition were recorded. If no evidence of community opposition was found in the case file, "none noted" was entered into the "Community Opposition & Reason" column of the data summary tables in Appendix B. Wherever data were not provided, such as the amount of parking listed in the ordinance, "N/A" was entered into the table. The total number of requests for parking above the zoning ordinance specifications was separated from those requesting less parking than the zoning ordinance suggests. From each of these, the number of approved appeals were tallied and compared to those declined; the number of cases with instances of community opposition was tallied against those with none. These findings are detailed in Chapter 4.

Interviews

Twelve interviews were held with members of four stakeholder groups by the thesis author in an attempt to determine the impacts the real estate market and community opposition have on adopting and implementing reduce parking ratios as part of Smart Growth development. The interviewees represented planners, developers, lenders, and community groups. The individuals were chosen for interviews based on their involvement in the greater Boston metropolitan transportation planning field or related community work. Table 3 lists the interviewees and their associated stakeholder group.

Table 3 List of People Interviewed and Their Affiliations

Stakeholder Group	Interviewee	Organization	Date
Planner	Bryan Glascock	Boston Dept of Environment	March 15, 2005
	Vineet Gupta	Boston Transportation Department	March 31, 2005
	Catherine Preston	Cambridge Planning Department	March 2, 2005
Developer	Byron Gilchrest	Gilchrest Associates	March 1, 2005
	Peter Nichols	Beal Company	March 24, 2005
	Ted Raymond	Raymond	March 21, 2005
	David Begelfer	National Association Industrial & Office Properties	March 21, 2005
Lenders	Jim Meleones	Bank of America, North Carolina	March 15, 2005
	Kevin Boyle	Citizens Bank	April 5, 2005
Community	Lucy Edmondson	EPA Region 1	March 3, 2005
	Shirley Kressle	local activist	March 17, 2005
	Marc Laderman	Fenway CDC Board President	April 12, 2005

The interviewees were contacted via email or telephone to set up interview dates and times. Whenever possible the interviews were conducted in person. The responses were recorded by hand, not by audio tape. The participants were informed of the research purpose and given the opportunity to choose not to take part. Each was asked whether they minded if their comments were quoted in the thesis and all gave consent.

The objectives of the interviews varied by the stakeholder group and are listed below.

Table 4 Interview Questions

Stakeholders		Questions
Developers	1	Do you consider the parking supply in the Greater Boston Metro area to be a problem?
	2	How do parking regulations impact your business?
	3	Have you ever requested a change in the required number of parking spaces? Was it an increase or a decrease? Was the request granted?
	4	What primarily drives your decisions regarding the amount of parking to provide at a site? Are their any obstacles in achieving such an amount? What do you think causes them?
	5	Have you ever had a financial lender request a variance in the amount of parking you intend to provide? What were the results? Why do you think it occurred?
	6	Have you ever had a community group object to one of your proposed developments? What were their objections? How did you handle the situation?
	7	Do you consider lower parking ratios problematic to your development goals?
	8	How do you see Boston's transportation and development situation in 20 years? What would you like to see with regard to how the city handles parking?
Planners	1	Do you consider the parking supply in the Greater Boston Metro area to be a problem?
	2	How does (Cambridge, Boston, Quincy) currently set parking regulations and zoning? By square foot, proximity to transit, road capacity, other criteria? Are there any plans to change the criteria?
	3	In your professional opinion, does the city provide enough parking? Is it in the right locations? What would you change?
	4	Do developers frequently appeal the parking regulations? Are they requests for more or less parking?
	5	What would be the biggest obstacles to lowering parking requirements (maximums rather than minimums and based on transit access)? Are there clear costs and benefits to lowering them?
	6	Is there a particular set of stakeholders that would be problematic in lowering parking ratios? What are their objections?
	7	Do you feel the market is a major obstacle to lowering parking ratios given increasing vehicle miles traveled and parking demand?
	8	What is your biggest challenge as a planner with regards to transportation and parking?
Lenders	1	Do you consider the parking supply in the Greater Boston Metro area to be a problem?
	2	In determining whether or not to fund a new development/redevelopment, is parking part of the decision making criteria? Is this based on the market or another factor?
	3	How does parking factor into the overall decision of whether to fund the project? (high or low priority)
	4	How do you measure the market demand for parking in new developments/redevelopment?
	5	Do you think the market has been shifting with regard to the amount of parking demanded? Is the market willing to accept less parking?
	6	Would lower parking ratios negatively impact your business? Why or why not?
	7	Have you ever requested for a developer to change the amount of parking they intend to provide on a project?
	8	Have you ever not funded a developer based on the parking allocation?
	9	What parking solutions would you like to see implemented? How would these benefit your business?
	10	Does Citizens Bank recognize smart growth as viable set of principles for urban development (higher density, multiple use, less parking, etc)?
Community	1	Does your community support smart growth principles, such as mixed use buildings and increased pedestrian mobility?
	2	Do you consider the parking supply in the Greater Boston Metro area to be a problem?
	3	Do you consider lower parking requirements feasible and desirable aspect of smart growth

principles?

4 Is there a parking program, such as residential permits, in your neighborhood? Does the program help solve the parking problem?

5 Do you see parking as the problem or is it more a part of increased density?

6 Does your community oppose developments that have less parking than required by zoning? What is the objection? How does the community address the issue?

7 How do you see future growth occurring in your community?

8 How do you see accommodating parking for that growth? What types of policies would you advocate for?

The responses for each stakeholder are listed in Appendix D. The interview questions were formulated by the thesis author and approved by Fred Salvucci, the thesis advisor. All the interviews began with the participant's perception of whether parking was a problem in Boston (all participants except for Jim Meleones are in the Boston area). The responses by each stakeholder group were summarized and different perceptions within the same group were highlighted. These findings are also detailed and discussed in Chapter 4.

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Appendix B: Travel Time Maps

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Figure 1 Ruggles Walk Times

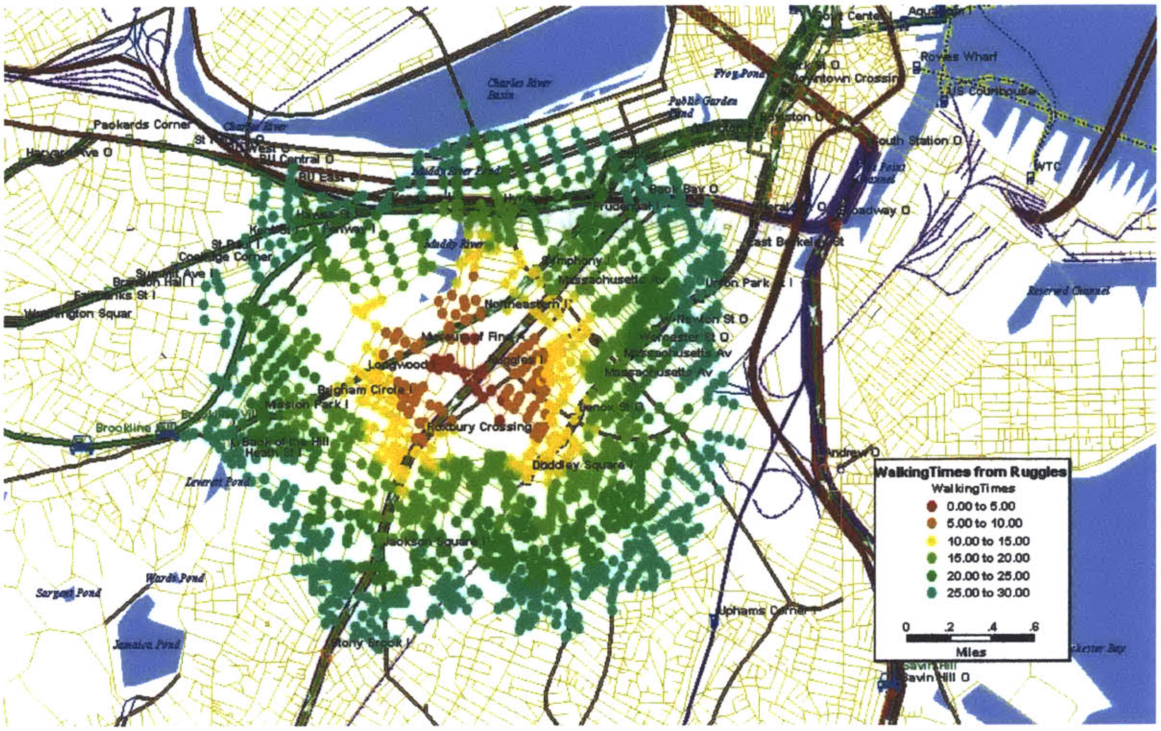

Figure 2 Ruggles Station Drive Times

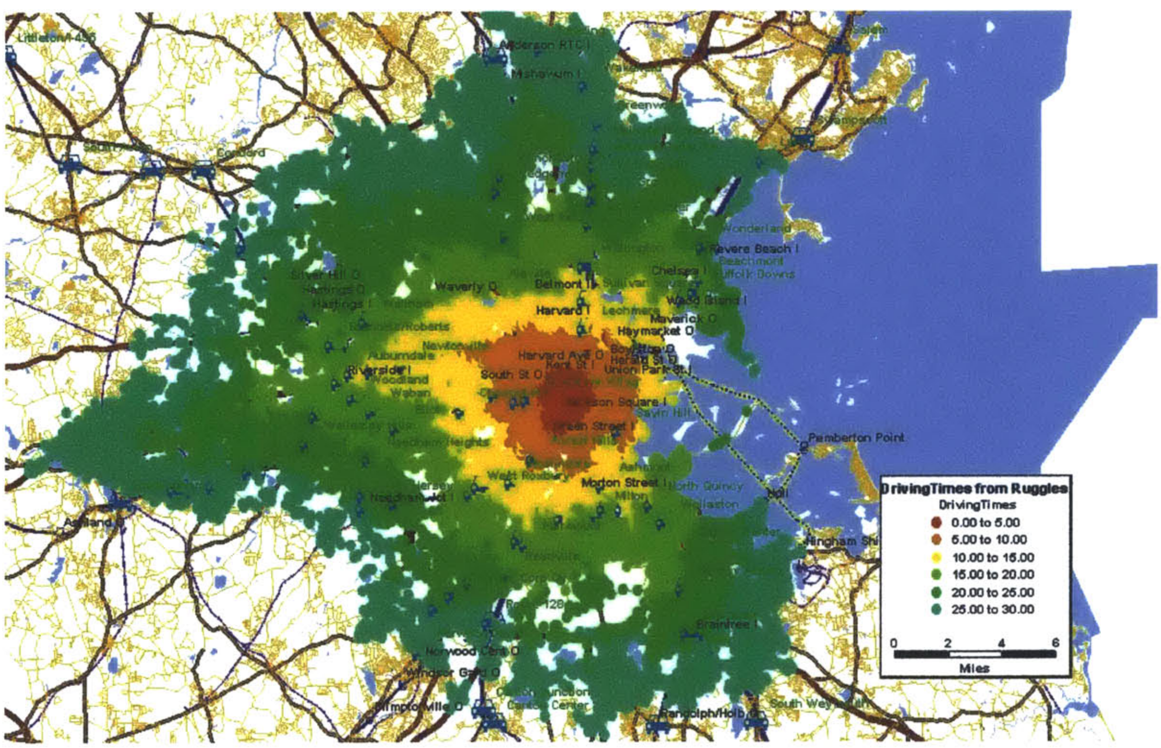

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Figure 3 Ruggles Station Transit Times

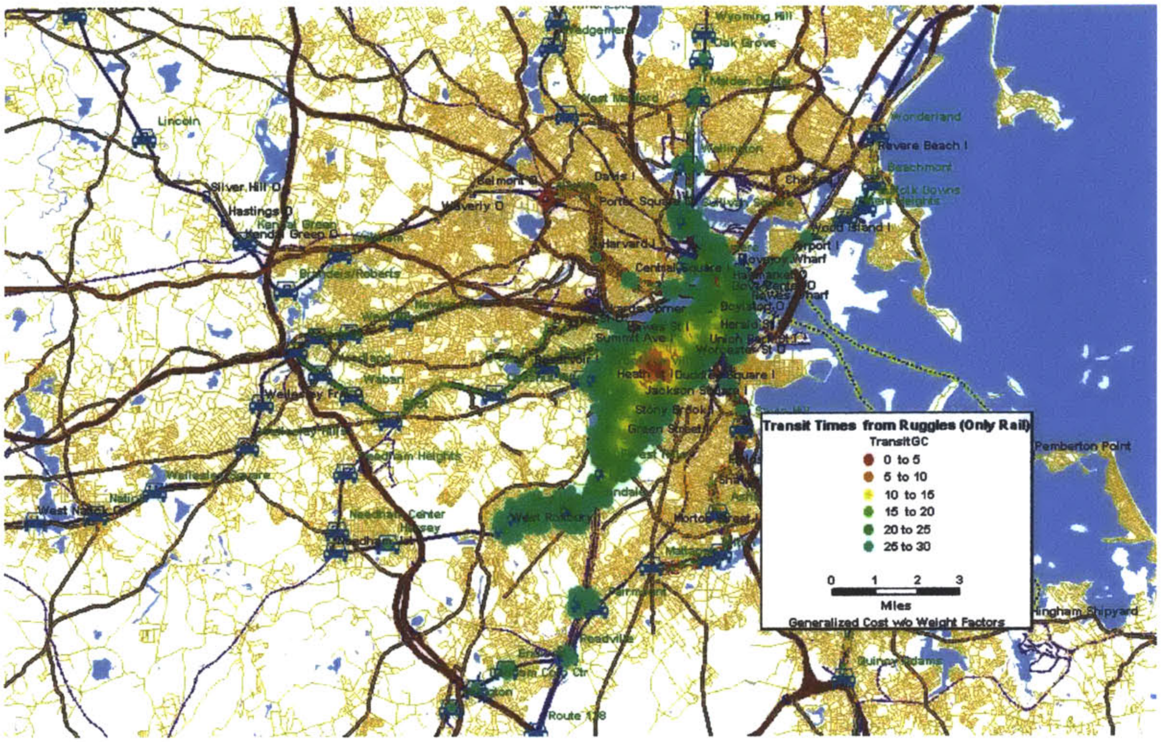

Figure 4 Quincy Center Walk Times

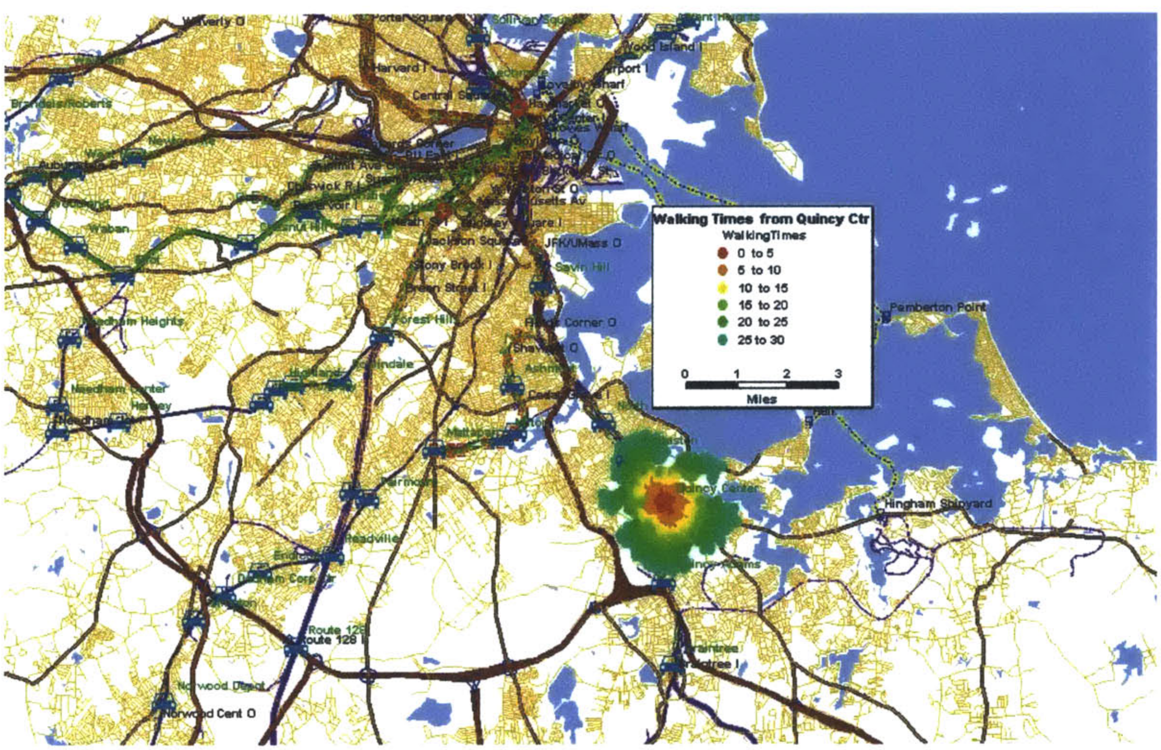

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Figure 5 Quincy Center Drive Times

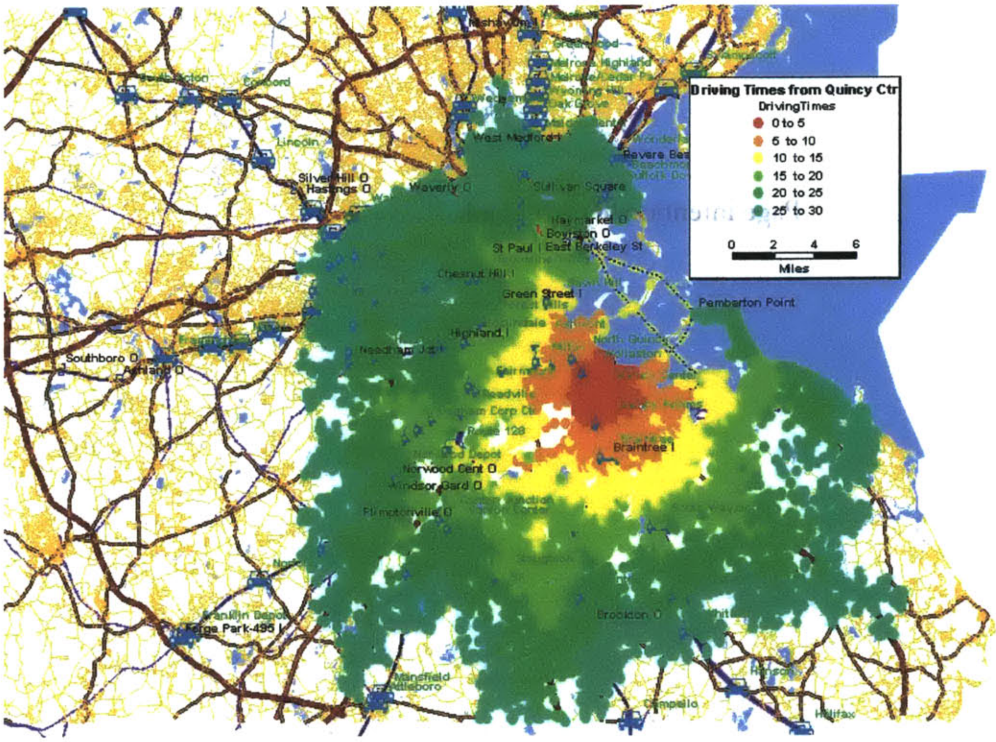

Figure 6 Quincy Center Transit Times

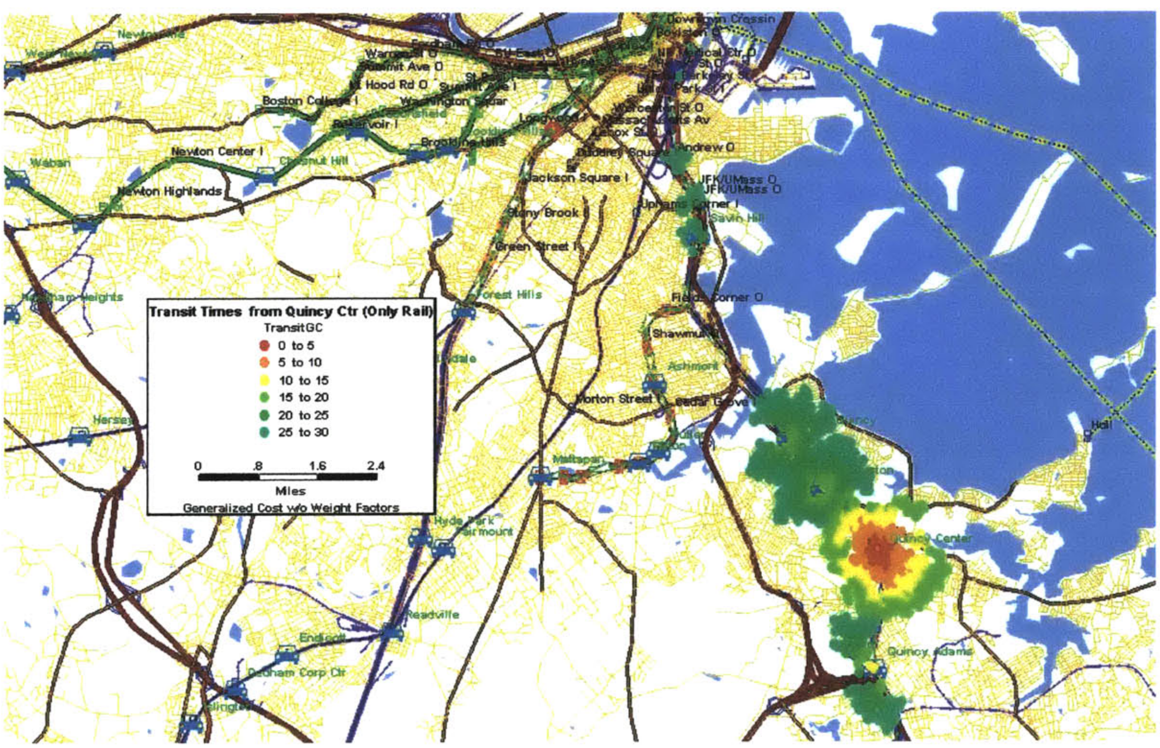

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Figure 7 Alewife Station Walk Times

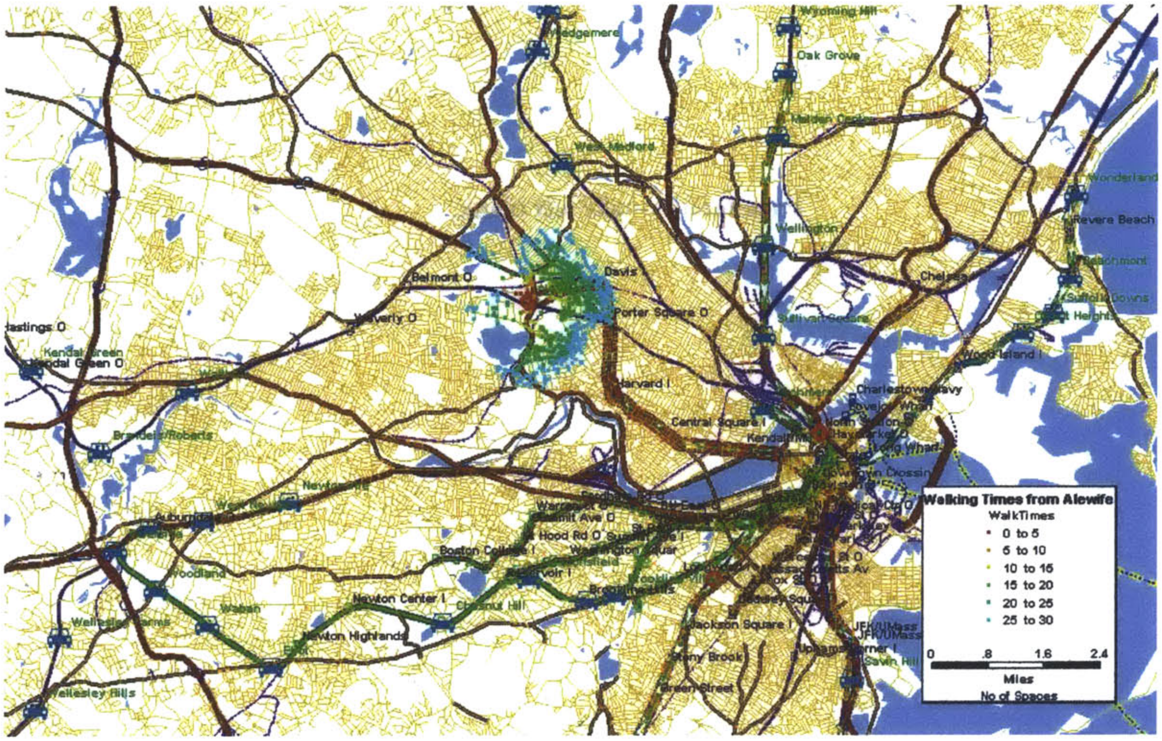

Figure 8 Alewife Station Drive Times

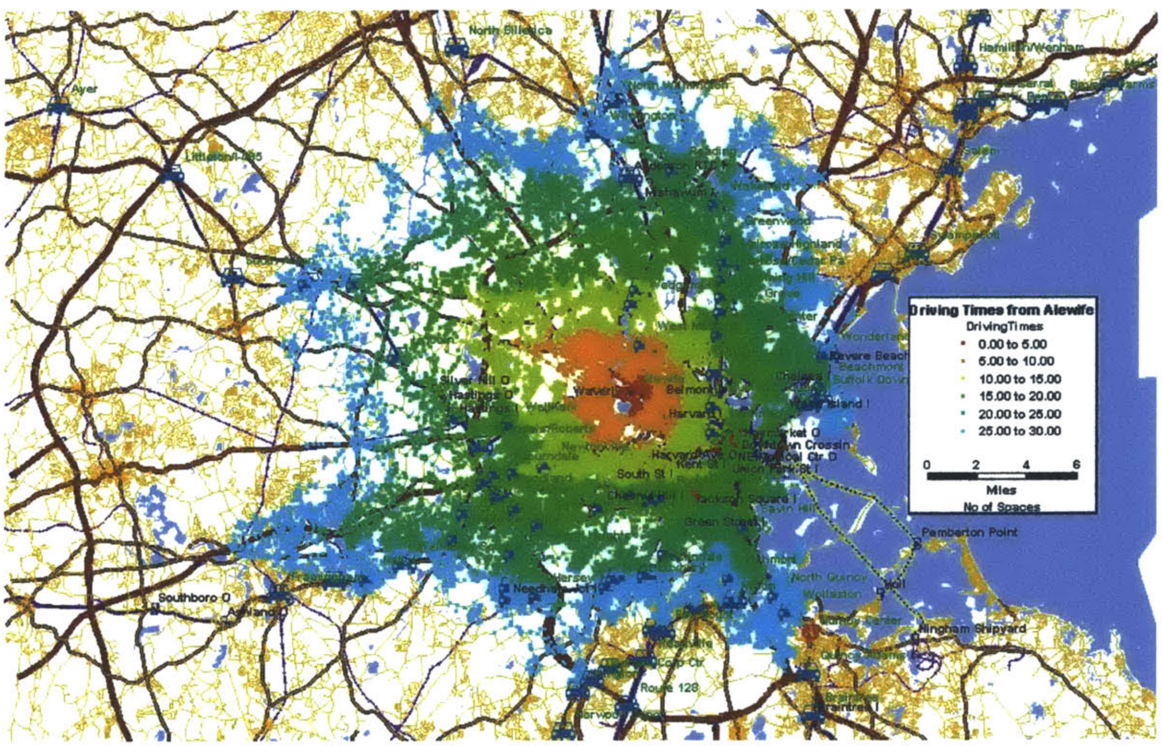

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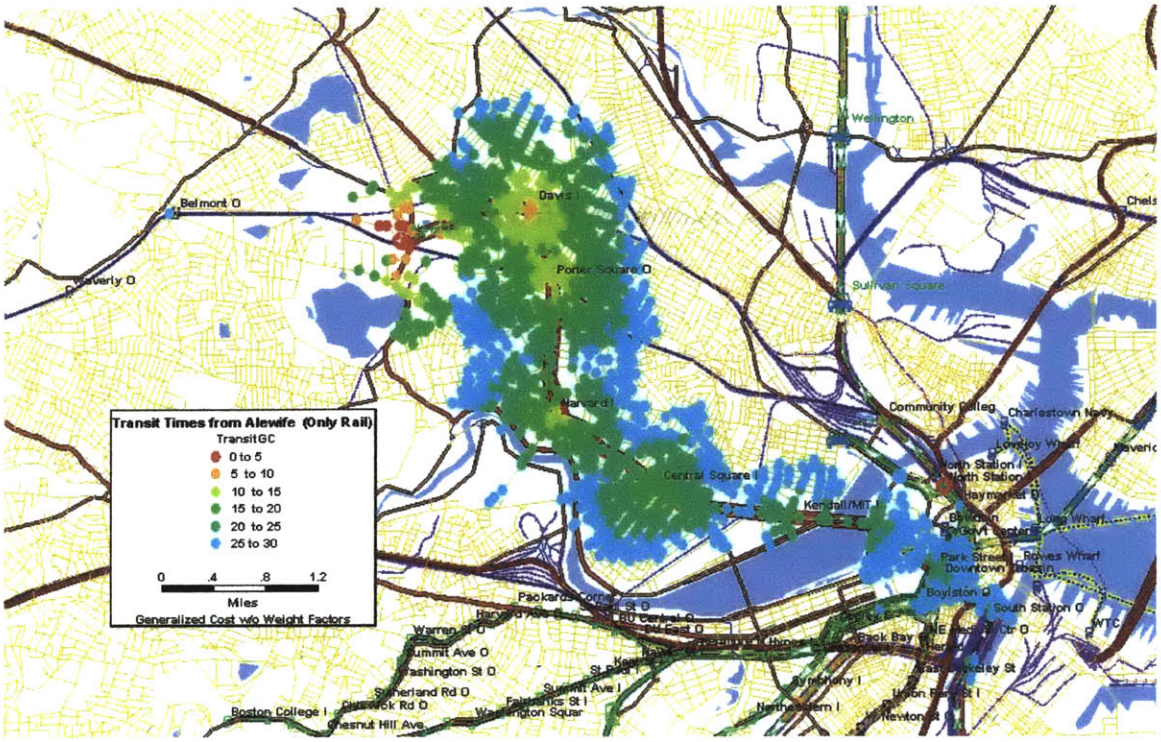
Figure 9 Alewife Station Transit Times



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Appendix C: Housing Cost Data Tables

Table 1. Comparison of Selling Prices for Studios and Lofts Sold With and Without Off-Street Parking from 1/2004 – 3/2005 (n=193)

City	Street Parking # Spaces Not Specified	n (street)	Average Selling Price	Minimum Price	Maximum Price	Median Price	Off-street Parking n (off)	Average Selling Price	Minimum Price	Maximum Price	Median Price	**Difference Between Average Selling Prices**
Beacon Hill	6	16	$249,955	$160,000	$399,001	$247,500	1	$310,000	$310,000	$310,000	$310,000	**$60,045**
Cambridge	0	8	$241,295	$164,900	$261,324	$251,893	6	$309,846	$270,000	$433,000	$291,061	**$68,551**
Fenway	4	39	$189,751	$135,000	$245,000	$189,000	2	$208,100	$186,200	$230,000	$208,100	**$18,349**
Midtown	6	4	$485,410	$218,600	$975,000	$385,000	6	$480,927	$311,000	$1,142,812	$360,000	**-$4,483**
North End	0	10	$272,890	$143,000	$525,000	$230,000	7	$392,672	$190,000	$650,000	$385,000	**$119,782**
Quincy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**
Roxbury	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**
South Boston	2	3	$331,780	$135,000	$582,000	$331,900	11	$352,818	$200,000	$482,500	$355,000	**$21,038**
South End	3	38	$306,133	$110,000	$619,000	$265,108	21	$537,131	$215,000	$1,845,000	$450,100	**$230,998**
	Standard Deviation		$95,036			Standard Deviation		$111,413				

Source: Listing Information Network

Note: It was assumed that an unspecified type of space referred to no off-street parking available with the unit. Hence, the average selling price for street parking includes both the number of spaces not specified and the number listed as "street." No listing of studio or loft sales appeared for Quincy and Roxbury.

Table 2. Comparison of Selling Prices for 1 Bedroom Condos Sold With and Without Off-Street Parking from 1/2004 – 3/2005 (n= 1,137)

	Street Parking						**Off-street Parking**					
City	# Spaces Not Specified	n (street)	Average Selling Price	Minimum Price	Maximum Price	Median Price	n(off)	Average Selling Price	Minimum Price	Maximum Price	Median Price	**Difference Between Average Selling Prices**
Beacon Hill	47	110	$377,678	$126,261	$799,000	$350,000	24	$522,208	$273,000	$1,600,000	$495,000	**$144,530**
Cambridge	0	15	$326,779	$215,000	$564,768	$370,000	70	$377,512	$248,000	$564,768	$365,000	**$50,733**
Fenway	64	81	$254,291	$96,411	$402,500	$264,500	16	$304,065	$215,000	$390,000	$288,500	**$49,775**
Midtown	6	28	$402,313	$126,260	$1,245,000	$377,500	28	$480,464	$310,000	$1,050,000	$381,000	**$78,151**
North End	20	54	$305,060	$150,000	$622,000	$295,500	28	$520,507	$303,000	$730,000	$515,000	**$215,447**
Quincy	0	0	$0	-	-	-	1	$180,000	$180,000	$180,000	$180,000	**n/a**
Roxbury	0	2	$199,000	$199,000	$199,000	$199,000	1	$361,000	$361,000	$361,000	$361,000	**$162,000**
South Boston	36	123	$274,288	$126,260	$1,050,000	$265,000	63	$362,390	$225,000	$569,000	$360,000	**$88,102**
South End	60	197	$377,981	$123,750	$930,000	$375,000	63	$532,519	$310,000	$945,000	$495,000	**$154,538**
	Standard Deviation		$123,780			Standard Deviation		$119,558				

Source: Listing Information Network

Note: It was assumed that an unspecified type of space referred to no off-street parking available with the unit. Hence, the average selling price for street parking includes both the number of spaces not specified and the number listed as "street." No listing of 1 bedroom condos without parking appeared for Quincy.

Table 3. Comparison of Selling Prices for 2 Bedroom Condos Sold With and Without Off-Street Parking from 1/2004 – 3/2005 (n= 1,417)

	Street Parking						Off-Street Parking					
City	# Spaces Not Specified	n (street)	Average Selling Price	Minimum Price	Maximum Price	Median Price	n(off)	Average Selling Price	Minimum Price	Maximum Price	Median Price	**Difference Between Average Selling Prices**
Beacon Hill	17	83	$581,409	$142,044	$1,330,000	$590,000	33	$940,180	$362,000	$2,915,000	$850,000	**$358,771**
Cambridge	0	17	$372,605	$235,000	$617,437	$384,500	65	$546,792	$230,000	$1,070,000	$557,850	**$174,187**
Fenway	54	36	$383,790	$185,000	$805,000	$383,750	10	$479,525	$354,500	$892,750	$438,250	**$95,735**
Midtown	26	24	$753,533	$142,044	$2,800,000	$612,500	89	$917,119	$142,040	$1,789,000	$875,000	**$163,587**
North End	12	29	$399,088	$255,000	$710,000	$385,000	36	$833,863	$307,000	$1,344,000	$855,000	**$434,774**
Quincy	0	0	$0	-	-	-	2	$367,250	$257,000	$477,500	$367,250	**n/a**
Roxbury	0	6	$260,667	$220,000	$305,000	$256,000	2	$347,500	$305,000	$390,000	$347,500	**$86,833**
South Boston	115	175	$349,135	$177,000	$670,000	$343,500	131	$411,267	$240,000	$1,480,490	$395,000	**$62,132**
South End	50	224	$509,838	$225,000	$995,000	$480,500	181	$786,301	$315,000	$1,675,000	$725,500	**$276,463**
	Standard Deviation		$210,049			Standard Deviation		$242,568				

Source: Listing Information Network

Note: It was assumed that an unspecified type of space referred to no off-street parking available with the unit. Hence, the average selling price for street parking includes both the number of spaces not specified and the number listed as "street." No listing of 2 bedroom condos without parking appeared for Quincy.

Table 4. Comparison of Selling Prices for 3 Bedroom Condos Sold With and Without Off-Street Parking from 1/2004 – 3/2005 (n= 300)

	Street Parking						Off-Street Parking					
City	# Spaces Not Specified	n (street)	Average Selling Price	Minimum Price	Maximum Price	Median Price	n(off)	Average Selling Price	Minimum Price	Maximum Price	Median Price	**Difference Between Average Selling Prices**
Beacon Hill	2	16	1,089,167	$565,000	1,850,000	1,037,500	5	1,806,000	1,565,000	2,145,000	1,770,000	**$716,833**
Cambridge	0	7	$446,571	$315,000	$585,000	$435,000	18	$761,912	$430,000	1,227,000	$750,000	**$315,340**
Fenway	6	2	$417,750	$285,000	$635,000	$400,000	1	$612,500	$612,500	$612,500	$612,500	**$194,750**
Midtown	7	7	1,114,399	$157,820	3,800,000	$642,500	14	1,525,729	$709,000	2,840,000	1,552,000	**$411,330**
North End	1	3	$494,750	$412,000	$675,000	$446,000	1	1,500,000	1,500,000	1,500,000	1,500,000	**$1,005,250**
Quincy	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	**n/a**
Roxbury	0	3	$344,000	$263,000	$490,000	$279,000	11	$366,091	$277,000	$428,000	$379,000	**$22,091**
South Boston	35	55	$425,130	$225,000	$800,000	$415,000	32	$440,234	$272,000	$625,000	$444,250	**$15,104**
South End	8	23	$630,917	$260,000	1,200,000	$549,000	43	1,061,197	$520,000	3,090,000	$982,200	**$430,279**
	Standard Deviation		$308,333			Standard Deviation		$547,868				

Source: Listing Information Network

Note: It was assumed that an unspecified type of space referred to no off-street parking available with the unit. Hence, the average selling price for street parking includes both the number of spaces not specified and the number listed as "street." No listing of 3 bedroom condo sales appeared for Quincy.

Table 5. Comparison of Average Selling Price for 2 Bedroom Houses (0 & 1 space only) (n=50)

City	None Specified	n (street)	Street	n(off-street)	Off-street	Difference
Beacon Hill	0	2	$1,105,000 n=2	0	n/a	n/a
Cambridge	0	0	n/a	1	$384,450 n=1	n/a
Fenway	0	0	n/a	0	n/a	n/a
Midtown	n/a	n/a	n/a	n/a	n/a	n/a
North End	0	0	n/a	0	n/a	n/a
Quincy	0	0	n/a	1	$460,000 n=1	n/a
Roxbury	0	0	n/a	1	$455,000 n=1	n/a
South Boston	16	16	$359,611 n=32	8	$377,688 n=8	$18,077
South End	1	0	$865,000 n=1	3	$1,059,667 n=3	$194,667

Note: The 'Street' column is the average for homes listed as street and those with none listed. The data did not include Midtown. The South End is not in closed proximity to any case study site, but offered the greatest sample size for more reliable data. The area is served by the Red Line, commuter rail, and several buses.
Source: Listing Information Network, 2005

Table 6. Comparison of Average Selling Price for 3 Bedroom Houses (0 & 1 space only) (n=91)

City	None Specified	n (street)	Street	n(off-street)	Off-street	Difference
Beacon Hill	0	5	$1,533,500 n=5	4	$1,565,000 n=4	$31,500
Cambridge	0	2	$529,500 n=2	7	$930,071 n=7	$400,571
Fenway	0	0	n/a	0	n/a	n/a
Midtown	n/a	n/a	n/a	n/a	n/a	n/a
North End	0	2	$722,000 n=2	0	n/a	n/a
Quincy	0	0	n/a	1	$340,000 n=1	n/a
Roxbury	0	0	n/a	0	n/a	n/a
South Boston	28	22	$428,016 n=50	6	$546,833 n=6	$118,817
South End	1	4	$1,008,000 n=5	8	$1,112,250 n=8	$104,250

Note: The 'Street' column is the average for homes listed as street and those with none listed. The data did not include Midtown. The South End is not in closed proximity to any case study site, but offered the greatest sample size for more reliable data. The area is served by the Red Line, commuter rail, and several buses.
Source: Listing Information Network, 2005

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Appendix D: Zoning Board of Appeals Case Data

Table 1. Boston Parking Appeals Data

	Location	Parking Appeal	Decision
1	Charlestown	2	approved
2	Charlestown	10	approved
3	South Boston	4	approved
4	South Boston	149	approved
5	South Boston	23	approved
6	South Boston	2	approved
7	South Boston	1531	approved
8	Dorchester	3	denied
9	Dorchester	3	denied
10	Jamaica Plain	3	denied
11	Brighton	210	approved
12	Brighton	35	approved
13	Brighton	6	approved
14	East Boston	20	denied
15	East Boston	2	approved
16	East Boston	11	approved
17	Roxbury	from 12 to 18	denied
18	South End	4	approved
19	Mattapan	2	approved
20	Chestnut Hill	30	approved

All new parking spaces except for #7, which was a renewal. All requests greater than 4 are commercial requests.
Source: Bob D'Amico, Boston Transportation Department, April 2005.

Table 2. Cambridge Parking Appeals Data

	Case #	Location/Type	Parking Appeal	Decision	Community Opposition & Reason
1	8765	Massachusetts Ave residential	existing: 0 requesting: 0 required: 56	Granted w/ conditions 11/2003	None noted
2	8862	River Street residential	existing: 0 requesting: 7 required: N/A	Granted w/ conditions 4 spaces, permeable surface, trees preserved 6/2004	Abutters and near residents size of lot, need for off-street parking, drainage concerns
3	8863	Sacramento Street residential	existing: 0 requesting: 2 required: N/A	Granted w/ conditions 2 spaces and possibly construct a wood fence 6/2004	None noted- previously discussed with abutters and compromised on 2 instead of 4 spaces
4	8712	Russell Street conversion from nursing home to residential	existing: 18 requesting: 26 required: 28	Granted w/ conditions 28 spaces w/ 2 in tandem (non-conforming) 10/2003	11 property owners concern unless conditions: lawsuit appealing decision; object to increased density, use of transit to reduce parking requirements, etc
5	8169	Massachusetts Ave restaurant	existing: 0 requesting: 0 required: 7	Granted 9/2000	None noted

6	8220	River Street residential	existing: 0 requesting: 0 required: 2	Granted 11/2000	13 neighbors request single instead of 2 family to reduce parking demand; concern for pedestrian and road safety
7	8232	Magazine Street residential	existing: 0 requesting: 2 required: 2	Denied 12/2000	None noted (other than denial) This variance request was responding to neighbors' requests after previous variance allowed development w/o parking
8	8244	Berkshire Street residential	existing: 2 requesting: old - 0, new - 3 required: old - 3, new - 2	Granted w/ conditions 3/2001	None noted
9	8240	Elm Street residential	existing: 4 requesting: 8 required: 18	Denied 1/2001	Planning Board - more asphalt Neighbors - loss of open space, renting spaces for profit
10	8286	Spring Street residential	existing: 0 requesting: 0 required: 3	Dismissed (no show)	N/A
11	8364	Massachusetts Ave residential	existing: 0 requesting: 0 required: 57	Denied 10/2001	Planning Board - already dense area; opposed unit size as too small, not parking
12	8397	Massachusetts Ave retail	existing: 7 requesting: 7 required: 12	Granted w/ conditions 11/2001	Neighbors objected to increased traffic and parking competition, residential rights protected by restrictions
13	8378	Columbia Street residential over bakery	existing: 0 requesting: 0 required: 3	Denied 4/2002	Neighbors parking shortage already in dense neighborhood; not clear this is reason for denial
14	8413	Lopez Street residential	existing: 1 requesting: 1 required: 2	Granted w/ conditions 3/2002	None noted
15	8612	Webster Ave residential	existing: 2 requesting: 1 required: 2	Granted w/ conditions 1/2003	None noted
16	8594	Tremont Street residential	existing: 0 requesting: 2 required: N/A	Denied based on lack of space & emergency access	None noted
17	8485	Auburn Street residential/afforda ble housing	existing: 0 requesting: 0 required: 7	Granted w/ conditions	Neighbors loss of light, declining property value, parking "disaster in area"
18	8452	Cambridge Street residential	existing: 84 requesting: 32 & 30 required: 32 & 30	Granted w/ conditions 5/2002	None noted
19	8641	Columbia Street residential over bakery	existing: 0 requesting: 0 (onsite) required: 2	Granted w/ conditions 2 spaces in adjacent lot 3/2003	None noted - worked out with community after denial of case 8378

Source: Cambridge Board of Zoning Appeals. Data collected March 28, 2005.

Table 3. Quincy Parking Appeals Data

	Case #	Location/Type	Parking Appeal	Decision	Community Opposition & Reason
1	01-015	Granite Street office/warehouse	existing: 0 requesting: 0 required:	Granted 6/2001	None noted
2	2739	Elm Avenue & Wollaston Ave office	existing: 9 requesting: 9 required: 11	Denied 10/1988	None noted
3	2877	Copeland Street & Common St retail	existing: 9 requesting: 17 additional required: N/A	Denied 10/1989	61 Neighbors oppose increased traffic,
4	00-059	Hancock Street mixed use residential	existing: N/A requesting: 111 required: 1.5 per unit	Granted w/ conditions 11/2000	None at meeting, letters submitted prior and appeal amended. Those were a city parking director, city councilor, and business association
5	01-016	Miller Stile Road residential	existing: 5 requesting: 7 required: 6	Granted 5/2001	None noted
6	01-030	Billings Road restaurant	existing: 7 requesting: 7 required: 29	Granted w/ conditions 7/2001	None noted - agreement made with nearby business to share parking
7	4132	Water Street residential	existing: N/A requesting: 6 required: 6	Granted 6/1994	Neighbor parking concerns
8	4275	Billings Road office	existing: 23 requesting: 23 + off-site required: 35/53	Granted 3/1997	Surrounding businesses lack of parking; owner leased 20 spaces from adjacent business
9	01-003	Willard Street mixed use	existing: 2 requesting: 5 required: 7	Granted 3/2001	None noted
10	4060	Copeland Street mixed use	existing: 0 requesting: 5 required: 8	Granted 7/1993	None noted
11	99-083	Billings Road office	existing: N/A requesting: less than required	Granted 12/1999	Concern noted, but not opposition; spaces leased from adjacent property
12	4194	Fayette Street residential	existing: N/A requesting: 1/unit required: 2/unit	Granted 8/1995	None noted
13	4104	Washington Street residential	existing: N/A requesting: 11 required: 12	Denied 1/1994	None noted
14	99-001	not noted retail to business	existing: N/A requesting: requesting less than required	Denied	Neighborhood meeting re use of parking lot instead of street

Source: Quincy Department of Inspectional Services, Zoning Board of Appeals. Data collected March 10, 2005 and March 16, 2005.

Appendix E: Interview Notes & Data

Exhibit 1. Objectives for Interviews

Developers

- Identify perception of the market for parking and whether lenders are an obstacle in reduced parking ratios
- Identify whether or not in favor of smart growth parking
- Determine what criteria most impact decision on how much parking to supply (zoning, construction costs, market demand, other?)
- Identify obstacles to achieving lower parking ratios (community opposition, lender unwillingness)

Planners

- Identify the extent of parking problem in city
- Identify whether or not the city supports shifting toward smart growth policies
- Identify opportunities and costs to shift
- Identify barriers to changing zoning for lower parking ratios (communities, market demand, political will)

Community

- Identify whether community supports smart growth principles
- Identify whether there are objections to lower parking ratios as they relate to smart growth principles
- Determine whether the objections are directly related to parking or as a means to oppose increased density and growth (including exclusionary zoning)
- Determine extent to which property values influence position on the matter
- Identify compromise possibilities for reducing parking ratios that will satisfy the community

Lenders

- Identify whether the lender supports smart growth principles
- Determine whether the lender feels *the market* supports smart growth
- Determine whether the market is willing to accept less parking
- Determine the extent to which the market dictates whether the development will be funded
- Determine the extent to which parking influences the market for new developments
- Determine what needs to change for lenders to fund developments with less parking (market shift, government subsidy, etc)

<u>Exhibit 2</u>. Questions & Answers for Planners
Catherine Preston (Cambridge), Bryan Glascock (Boston), Vineet Gupta (Boston)
Note: The responses have been identified by letter (A, B, C) rather than by the name of the person interviewed. None of the responses are direct quotes, all have been paraphrased.

1) Do you consider the parking supply in the Greater Boston Metro area to be a problem?
A: larger apartment buildings for residential and for some neighborhood constraints

B: with residential the lack of or expense of parking is not what keeps people from living downtown; suppresses cost of older buildings without parking; more of an issue farther out where parking is approximately $10/day to park (see concentric map) and where low skill jobs (overnight shifts, manufacturing, job sites) are off transit system; downtown jobs of middle management and higher skills on transit system; morning peak congestion is frustrating but helps the mode split

C: no and yes: no as the shortage of parking and resulting pricing encourages alternative modes for commuters – fewer spaces leads to fewer (single occupancy) vehicle trips by commuters; yes in neighborhoods where transit access is limited – when the density in these neighborhood increase without additional parking, it can result in a lower quality of life

2) How does (Cambridge, Boston, Quincy) currently set parking regulations and zoning? By square foot, proximity to transit, road capacity, other criteria? Are there any plans to change the criteria?
A: for office use, Cambridge attempts to match demand with mode choice

B: ad hoc and changes over time; in the late '80s a group looked at parking; ratios averaged .6/1000; changed to .4/1000sf given area, highway capacity, parking capacity (if free to change the ratio at will) – would change transit later as density increases.

C: there is not a technical formula used; access to transit and density are considered; residential ratios may depend on the number of bedrooms and "class" of the building (i.e. luxury)

3) In your professional opinion, does the city provide enough parking? Is it in the right locations? What would you change?
A: The regulations were updated: 1998 TDM Ordinance passed during height of real estate boom; 2002 established a max parking for office and R&D space; Alewife predates current regulations

B: see answer for #2

C: Boston's parking is fairly well distributed; residential areas have enough spaces but not always enough transit access; would change how management of new parking is handled

4) Do developers frequently appeal the parking regulations? Are they requests for more or less parking?
A: development community originally opposed parking requirements; communities supported the requirements because of increasing traffic and feared pace of growth; community of 2 minds that are largely neighborhood dependent – prevent additional traffic; - protect own parking space

B: yes – large developments with additional parking neighborhood; less so with smaller projects but for high end residential (assumption of 2 spaces/unit); different to reject appeal in already dense areas (current nh already has RPP with stickers for residents only; revenue stream); easy to appeal in South Boston because of parking bank

C: a significant number request changes and usually for more parking; for one, the banks that finance developers are not convinced that projects are viable and do not understand density and transit connections well (in redeveloping Boston's parking regulations, the BTD brought in several people from the finance world to discuss the impacts of parking on development), and the banks consider community opposition a risk as well.

5) What would be the biggest obstacles to lowering parking requirements (maximums rather than minimums and based on transit access)? Are there clear costs and benefits to lowering them?

A: the new requirements are reasonable and tolerable; there is now a penalty for above grade parking except in Alewife due to the water table.

B: NA

C: the requirements here are not hard and fast; they are viewed as a starting point for discussion (guidelines rather than regulations); feels that the process helped the BTD to change the culture with developers to understand more is not always better in terms of parking; re: the assumption that reduced parking is most desirable/beneficial to developers has held true for smaller projects (≤10 units) when parking is very expensive (economies of scale); less true for larger projects; Fenway min and max at .75 spaces/unit – what community wanted after much discussion with the city

6) Is there a particular set of stakeholders that would be problematic in lowering parking ratios? What are their objections?

A: car ownership has increased but rent control ended; incomes increased and family demographics shifted to roommates; lack of off-street parking is increasingly difficult; role of planning department is not exacerbate the problem or encourage additional off-street

B: CLF wanted .2/1000sf; developers – willing to run with it if there are successful examples, costs were lowered; would offer minimum; additional housing – more returning from suburbia; community tension: new vs. existing communities see lower parking as pressure on RPP; want more parking than planned – add enough off-street to accommodate 1/unit; example: Wilkes Passage – built significantly more parking and offered spaces to neighborhood to fund affordable housing;

C: varies by location but generally equal between developers, lenders and communities; Boston ZBA requires some developments to have documented agreements set with communities re parking in the neighborhood; communities: 2 minds: want less parking because of traffic and congestion in neighborhood. Or want more parking because of competition for their own spaces; office side: not too much objection, most new buildings in Boston are mixed use and not office

7) Do you feel the market is a major obstacle to lowering parking ratios given increasing vehicle miles traveled and parking demand?

A: in the residential ownership market it is difficult to sell without at least 1 space; lower requirements would face opposition; the market will accept 1 space/unit and perhaps lower given the 15% required affordable housing; the lack of development in Alewife is due to the expense of the current biotech buildings and new development having to follow new regs – no incentive to redevelop

B: Most people won't pay $350,000+ for a condo without a parking space and lenders are wary of office and other commercial developments with little or no parking. Many lenders are used to working in suburban locations or outside the East Coast and have a hard time understanding that
Boston works well without much parking. Also, right now traffic is flowing and people can still get to where they want to go w/o too much trouble, so the demand to restrict parking is not that high (but see today's Globe article on Councilor Scarpiccio's proposal on peak-hour tolls for coming into the City).

C: market the major obstacle in the downtown and residential areas; less of a problem convincing the developer now so market has shifted slightly; new residential owners less likely to get RPP

8) What is your biggest challenge as a planner with regards to transportation and parking?
A: little challenge with non-residential: they know what to respect with regard to flexibility

B: economic balancing act; quality of life implications; difficult to get new residents from suburbia into urban mind set; however, parking is not inhibiting business growth in CBD (passed on to customers); business types sort out by location according to needs anyway

C: educating the community that fewer spaces would resolve the congestion problems in the community; don't see businesses leaving Boston due to parking or see parking limits as a disincentive; rather businesses are looking for a way to better manage their parking (i.e. the parking contraption to save space; now asking mixed use developers to distinguish parking by use so that spill over from one another does not occur (residents parking in hotel spaces and vice versa)

9) How serious a conflict do all types of parking have with other amenities, such as porches, roof top gardens, etc?
A: tradeoffs not presented this way; usually presented as a financial tradeoff given that parking is mostly structure; more with need to seek relief from these costs

B: condo price is such a hurdle for buyers that parking is irrelevant to price

C: not sure

10) Are many developers requesting to provide less parking than the new regulations require? (only asked of #2)
B: Not lately, I recall there have been in the past but right now most of the South Boston development has been meeting the BTD guidelines.

#3 regarding housing costs:
Less parking would decrease the cost of housing; MBTA program through Mass Housing and Finance department

#3 regarding shared parking:
Does not reduce vehicle trips; for residents, they aren't always using their cars when businesses would need the space so the supply doesn't always translate into open parking spaces (or vehicle trips by residents during peak hours)

<u>Exhibit 3a</u>: Questions & Answers for Developers
Ted Raymond, Byron Gilchrest, Peter Nichols, David Begelfer
Note: The responses have been identified by letter (A, B, C) rather than by the name of the person interviewed. None of the responses are direct quotes, all have been paraphrased.

1) Do you consider the parking supply in the Greater Boston Metro area to be a problem?
A: yes and no, need for transit as a benefit

B: new build offices need subsurface parking to be marketable; if unable to provide it okay if near transit; residential: decrease in price value or rental price b/c on average occupiers have 1 car; different if near 'T'; commercial spots are leasable;

C: Need depends on use: land use components (residential, office, retail) and VMT may vary; in new development in N End, most spaces used as storage; 70 spaces will generate half the traffic of the 45 spaces that were previously there in a surface lot

2) How do parking regulations impact your business?
A: new construction impacted by parking regulations

B: no; nothing to do with requirements of maximum as long as near transit; depletion of land a bigger problem

C: understand developer, construction costs (unionized?), land cost, etc as related to profit margin

3) Have you ever requested a change in the required number of parking spaces? Was it an increase or a decrease? Was the request granted?
A: N/A

B: conversion in Back Bay – not new real estate but using old space for parking: very high end with 5 to 8 units

C: yes, for the North End development; 55 units with 70 parking spaces; ultimately it was a compromise

4) What primarily drives your decisions regarding the amount of parking to provide at a site? Are their any obstacles in achieving such an amount? What do you think causes them?
A: willingness to go with reduced

B: long term experience with the market; market is not shifting too much and vehicles per household not rising as fast

C: NA

5) Have you ever had a financial lender request a variance in the amount of parking you intend to provide? What were the results? Why do you think it occurred?
A: based on appraiser

B: never had it happen; lenders are not good developers; would switch lenders because developers know their market

C: lenders look for market study, likely buyers, size, and amenities: including parking;

6) Have you ever had a community group object to one of your proposed developments? What were their objections? How did you handle the situation?

A: yes, traffic and safety

B: yes; Clarendon; used city parking regulations; told community to go the city with complaints; heard public meeting comments; high rise building hard for street-parking: long term, RPP stickers, rent space if have the money

C: 2 minds: some insist on 2 spaces/unit (N End and Charlestown); no competition for spaces and no increase in traffic; often in conflict with BRA

7) Do you consider lower parking ratios problematic to your development goals?

A: no – condo conversion in Beacon Hill: 46 units with no parking because in a pedestrian oriented area; pre-existing condition

B: some market resistance from residential

C: depends on market; office space general rule: 250 sf per person so about 1 space per 5 employees if 1/1000sf; again, the market: North End development: 30 units already sold and only 1 w/o parking space; price of parking is $80,000 for single, $100,000 for tandem; cost $50,000/space to build; units sell for $500,000 to $1M

8) How do you see Boston's transportation and development situation in 20 years? What would you like to see with regard to how the city handles parking?

A: major increases in transit capacity (following Salvucci vision)

B: Tokyo ideal; land values so high that they just don't park in the city; transit capacity to serve with very little vehicular traffic; relocation for businesses whose services need cars

C: downtown as an island and historical area; only thing left to develop are surface lots; developable land is more scarce and more expensive; office spaces will change congestion issue whereas residential won't; congestion increases as density increases no matter what;

<u>Exhibit 3b</u>: Questions & Answers for Developers from Business Perspective
Note: One of the developers was interviewed using a separate set of questions relating to business due to his position. Again, the name has been replaced by a letter.

1) Do you consider the parking supply in the Greater Boston Metro area to be a problem?
D: yes, in general now. It will be more severe in the future though.

2) How do parking regulations impact your business?
D: Both employees and customers are impacted. It is difficult to attract some employees. Mass transit access and capacity (including park and ride) have a major impact.

3) Have you ever based a decision on where to locate your business on the amount and cost of parking? Was cost or supply more important?
D: It is always a consideration – becoming more so given that the South Boston parking option is being reduced (referring to South Boston lots near the financial district being used as spillover). The Central Business District will have unmet need. Cost is more important – rent, parking, etc. adds significantly to costs.

4) What primarily drives your decisions regarding the amount of parking to provide at a site? Are mainly for employees or customers? Have you ever received a complaint about your parking supply?
D: It is out of the builders hands. The limitations are imposed by zoning. It is a disincentive to have parking

5) Do you provide any transportation assistance to your employees (car pool, rides home, transit subsidies, etc)?
D: Many businesses offer some kind of MBTA discount. Carpooling is more on the part of the building owner.

6) Have you ever had a financial lender deny a loan based on the amount of parking you intend to provide? What were the results? Why do you think it occurred?
D: Not really; there is a stopgap of alternatives plus there is not a large increase in the amount of office space at the moment in Boston. The situation may get worse when the South Boston parking supply is reduced. Given the loss of the South Boston supply, the parking restrictions are unrealistic based on demand for capacity.

7) Have you ever had a community group object to one of your business? What were their objections? How did you handle the situation?
D: Residential development also seems to be in crisis regarding parking. It is impossible for visitors to park, which is not helped by the Boston parking freezes and loss of metered spaces. Removal of meters for residential parking permit programs also affects retail areas.

8) Do you consider lower parking ratios problematic to your business goals?
D: Only affects one part of the equation.

9) How do you see Boston's transportation and development situation in 20 years? What would you like to see with regard to how the city handles parking?
D: If it is really about the Clean Air Act, adjust the parking freeze to account for the lower emission vehicles available now that weren't in 1973. The freezes hurt Boston's economic development – not as strong as it could be. MBTA needs to upgrade, which is definitely supported by the business community.

Exhibit 4: Questions & Answers for Lenders
Jim Meleones (Bank of America), Kevin Boyle (Citizens Bank)
Note: The responses have been identified by letter (A, B, C) rather than by the name of the person interviewed. None of the responses are direct quotes, all have been paraphrased.

1) **Do you consider the parking supply in the Greater Boston Metro area to be a problem? Is there enough residential parking?**

A: multi-family homes – newer property and under-parked could be a problem

B: fund to ensure ample parking with preference for on-site, especially from the marketing perspective

2) **In determining whether or not to fund a new development/redevelopment, is parking part of the decision making criteria? Is this based on the market or another factor?**

A: yes – in addition to: who is the tenant; lease terms; market rent (higher rent for office and retail); staggered lease end (for mult in one building); occupancy rates; competition; ingress/egress

B: parking is considered from the market perspective

3) **How does parking factor into the overall decision of whether to fund the project? (high or low priority)**

A: adequacy of parking a pretty critical factor; performance record considered;

B: mid-high priority in decision-making

4) **How do you measure the market demand for parking in new developments/redevelopment?**

A: multiple family - 2+ per unit; office – 1 per 1000sf; residential at 1 per unit for urban locations and less than 1 for cities such as NY; becomes more over 20 years (?); loans provided for parking decks

B: The developers come with a proposal for on-site or not

5) **Do you think the market has been shifting with regard to the amount of parking demanded? Is the market willing to accept less parking?**

A: Baltimore as under-parked; developers want to develop freestanding office buildings more than a parking garage

B: It is not shifting.

6) **Have you ever requested for a developer to change the amount of parking they intend to provide on a project?**

A: compromise reasonable

B: have not seen a situation where imposed action on developer

7) **Have you ever not funded a developer based on the parking allocation?**

A: Reject, yes, but not specifically for the parking; could be added or restructure

B: N/A

8) **Would lower parking ratios negatively impact your business? Why or why not?**

A: Yes;

B: N/A

9) What parking solutions would you like to see implemented? How would these benefit your business?

A: parking such a premium in NYC and Boston; would like to see 1st 10 floors as parking; if number crunching makes sense, have attached spaces at higher rents; "the American Way" to wait in traffic

B: Residential developers: offer subsurface parking; increases costs so would make sure only enough needed is supplied; unbundled parking (has occurred in Boston area)

10) Does your bank recognize smart growth as viable set of principles for urban development (higher density, multiple use, less parking, etc)? (only asked of B)

B: not familiar with Smart Growth principles; looks at projects on a case-by-case basis; would consider such principles if they seemed marketable

<u>Exhibit 5</u>: Questions & Answers for Community Representatives

Shirley Kressle, Lucy Edmondson, Marc Laderman

Note: The responses have been identified by letter (A, B, C) rather than by the name of the person interviewed. None of the responses are direct quotes, all have been paraphrased.

1) Does your community support smart growth principles, such as mixed use buildings and increased pedestrian mobility?

A: yes, but parking freeze upside down; should include accessory parking; just a way to evade EPA requirement, difficult to have due to transit cuts and higher density with no increase in parking supply; major inequities between income levels; HUD standards are 3x Boston median income but still accepts national standards instead of setting own in terms of affordability

B: trying in real estate market near transit; mixed use, increased density, encouraging transit, discouraging sprawl; investing in more dense, smaller; but there are fewer tax incentives (?)

C: Yes, hope to see our community as an example of Smart Growth and energy efficiency for the city

2) Do you consider the parking supply in the Greater Boston Metro area to be a problem?

A: yes; BRA gives too much parking; yet low income communities don't have off-street and as density increases on-street is not enough; much of problem stems from cost of housing near transit; vicious cycle of building more and then adding more parking and then building more…; refer to #1 regarding parking freeze

B: freeze has helped make Boston livable: not a problem (promotes scarcity and pricing), financial barriers limit reduction in congestion; shortage of parking at commuter rail stations

C: If you build more parking, more will come; the neighborhood already had unusually low parking ratios, so while some consider a problem, the neighborhood seems to have a different outlook

3) Do you consider lower parking requirements a feasible aspect of smart growth principles?

A: yes but not enforced by city; turning Boston into auto-oriented city; Boston's parking regulations are the problem; residential set at minimum instead of maximum; city government trying to help middle class instead of low income; really need added (and promised) transit expansions

B: possible if work with community closely and patiently and provide examples to show not a threat to destroy the neighborhood and not just <u>imposed</u> by government; TOD/SD/livability – all get to parking; need to approach from these perspectives that are normally hidden; huge component in engagement, can't be reduced or ignored – needs active management; traffic calming uses parking as a benefit

C: The community recently revamped the zoning requirements and settled on 0.75 space/rental unit maximum and minimum (1 space/ownership unit). The current supply ranges from approximately .55 to .85 spaces/unit as it is – so yes, it is feasible.

4) Is there a parking program, such as residential permits, in your neighborhood? Does the program help solve the parking problem? If there is not a parking program, do you feel your neighborhood would benefit from one? What type of program would you like – resident permit, day-time metering, etc?

A: NA

B: very effective at discouraging commuter traffic and protecting home owners and renters; tool for preventing spillover

C: RPP helps the system with the problem, but supply does not increase as the number of permits rise; helps neighborhood visitors; most residents "store" their cars on the street; RPP is also fairly honest – no illegal selling of permits and dorm addresses not issued permits. A fee for permits not infeasible, but administratively so expensive that may not be worth it. It would also not be competitive with the cost of renting a space by the month. Additionally, city residents may not understand the economics of a parking space or RPP fee (referred to modal Americans believing that the price of gasoline is inelastic)

5) Do you see parking as the problem or is it more a part of increased density?

A: problem is that new residents are not supporting transit; "poor step sister"; problem is with government policies toward middle and low income people

B: N/A

C: Some residents are afraid of the change and the density; overall, the majority embrace and favor density to support a "peopled" streetscape; primary worry is over height of new buildings

6) Does your community oppose developments that have less parking than required by zoning? What is the objection? How does the community address the issue?

A: low income communities want parking; currently only have on-street; as density increases on street availability decreases; still need cars because transit is inadequate

B: communities fear density growth and traffic/parking density; transit increases land value; don't want density just to increase (based on Tufts/Medford experience)

C: The objection is less from the community than lenders. A major high-density mixed use development in the area faced financing difficulties based partly on lenders concern over lack of parking. The community for the most part sees higher density as a tool to demand more services and transit capacity

7) How do you see future growth occurring in your community?

A: toward parking and auto-orientation; if you were to calculate the number of sf going to parking it would amaze; for example, one N Cambridge project has 1/3 of total area as parking; another example: Stop-n-Shop remodel held up by BRA citing lack of parking; tried off-peak shared parking; yuppies and empty nesters taking over;

B: NA

C: Adding 10,000 people to the neighborhood and becoming more like Boylston Street in the Back Bay (pedestrian friendly, restaurants, retail, and supported by residents and visitors)

8) How do you see accommodating parking for that growth? What types of policies would you advocate for? (posed to B as: "How do you think Boston should handle increasing demand for parking (especially with rising housing costs)?"

A: would advocate for more transit capacity, more affordable house (really affordable),

B: awareness building; higher fees;
Logan – timing of parking w/ regards to long and short term (location efficient); TMAs – gov't and private funding; Commuter shuttles – Alewife to day care shuttle; Charles River TMA N Station shuttle to Cambridge; Make alternatives CBA equivalent

C: Would not do too much to accommodate parking. Keep with.75 space max/min; improve transit in area (green line improvements, commuter rail station improvements, and the forthcoming Urban Ring) to accommodate growth

Appendix E: ITE Parking Generation Land Use Descriptions and Average Supply Ratios

ITE Parking Generation Land Use Descriptions and Average Supply Ratios

R2 refers to parking demand; n=refers to number of study sites (mult years were only counted once)

Light Rail Transit Station w/ Parking (093) (n=16)
Independent variable: daily boardings (originations in this study)
Average parking supply ratios:
280 spaces/1000 boardings for suburban; R2 = NA
150 spaces/1000 boardings for urban; R2 = 0.64

General light industrial (Alewife site across commuter rail from T station) (110) (n=7)
Independent variable: 1,000 sf GFA and number of employees
Average parking supply ratios:
1.1 spaces / 1000sf; R2 = 0.81
1.3 spaces / employee; R2 = 0.99
Average site employment density (all shifts)
1200 sf GFA / employee

Industrial Park (Alewife – Cambridge Park Drive) (130) (n=8)
Independent variables: 1,000 sf GFA and number of employees
Average parking supply ratios:
1.6 spaces / 1000sf; R2 = NA
1.2 spaces / employee; R2 = 0.66
Average site employment density (all shifts)
900 sf GFA / employee

Single-family Detached Housing (210) – on individual lots (n=1)
Independent variable: dwelling units
br between 1 and 4, with mean = 2.7, mode = 2, median = 3
Average parking supply ratios:
2 spaces / dwelling unit; R2 = 0.69

Table 1. Vehicles Ownership per Household* (%): Census Data from 1960 to 2000

Year	No Vehicle	One Vehicle	Two Vehicles	Three or More
1960	21	57	19	3
1970	17	48	29	6
1980	13	36	34	17
1990	12	34	37	17
2000	9	34	39	18

*Single and multiple family households under ownership; refers to Portland, OR region
Source: ITE *Parking Generation* (McCourt 2004)

Table 2. Vehicles Per Household* by Type of Area: 2000 Census Data

Type of Area	Vehicles Owned Per Household
Suburban	2.0
Central City, not downtown	1.8
Central Business District	1.6

Areas within 1/3 mile of LRT station & >10 miles from CBD	1.9 – 2.0
Areas within 1/3 mile of LRT station & <10 miles from CBD	1.6 – 1.8

*Single and multiple family households under ownership; refers to Portland, OR region
Source: ITE *Parking Generation* (McCourt 2004)

Low/Mid-Rise Apartment (221) – up to 4 floors (n=26)
Independent variable: dwelling units
Average parking supply ratios:
1.4 spaces/ dwelling unit (both suburban and urban); R2 = 0.93
Suburban site data: average of 1.7 bedrooms/unit and 0.9 spaces per bedroom
Urban site data: average of 2.2 bedrooms/unit and 0.8 spaces per bedroom (half of sites considered affordable housing)

Table 3. Vehicles Per Rental Household* by Type of Area: 2000 Census Data

Type of Area	Vehicles Owned Per Household
Suburban	1.4
Central City, not downtown	1.2
Central Business District	0.7
Areas within 1/3 mile of LRT station & >10 miles from CBD	1.0 – 1.3
Areas within 1/3 mile of LRT station & <10 miles from CBD	0.8 – 1.2

*Rental households only; refers to Portland, OR region
Source: ITE *Parking Generation* (McCourt 2004)

High-Rise Apartment (222) - ≥ 5 floors (all within 3 blocks of transit service) (n=2)
Independent variable: dwelling units
Average parking supply ratios:
CND: 1.95 spaces/unit; R2 = 0.85
CBD: NA

Residential Condominiums/Townhouse (230) (suburban only) (n=8)
Independent variable: dwelling unit
Average parking supply ratios:
0.98 spaces/unit; R2 = 0.90

Hotel (310) (suites only; not business, motel or resort) (n=13)
Independent variable: # of rooms
Average parking supply ratios:
1.3 spaces/room; R2 = 0.75

Office Building (701) (includes general, corporate HQ, office parks and R&D centers) (n=95)
Independent Variable: 1,000 sf GFA and number of employees
Average parking supply ratios:
4.0 spaces / 1000sf; R2 = 0.91 (suburban); 0.73 (urban)
1.1 spaces / employee; R2 = 0.91
Average employment density
3.3 employees per 1000 sf GFA

Government Office Building (720) (n=4)

Independent variable: 1,000 sf GFA and number of employees
Average parking supply ratios:
3.3 spaces / 1000sf; $R2$ = NA
0.85 spaces / employee; $R2 = 0.81$
Average employment density
4 employees per 1000 sf GFA

Shopping Center (820) (n=184)
Independent Variable: 1000 sf GFA
Average parking supply ratios:

Type of Center	Strip	Neighborhood	Community	Regional
Parking Ratio (spaces/1000 sf)	4.1	4.4	5.3	6.1
Building Area (in thousands)	< 30	30 – 100	100 – 400	400 – 800

All the following for non-December:
M-Th $R2= 0.98$
Fri $R2 = 0.97$
Sat $R2 = 0.98$
Sun $R2 = 0.98$