Congestion Mitigation Commission Technical Analysis

Increase Cost of Parking in the Manhattan Central Business District (CBD)

technical memorandum

prepared for

New York City Economic Development Corporation
New York City Department of Transportation

prepared by

Cambridge Systematics, Inc.

December 10, 2007
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Executive Summary

During a typical weekday in 2005, about 800,000 autos, taxis, trucks, and vans were estimated to have driven into Manhattan below 59th Street, the area typically regarded as New York’s Central Business District (CBD). Census data from 2000, the most recent year available, indicates that more than 270,000 people drive to work in New York’s CBD on a typical weekday that year. These drivers and their passengers make up about 16 percent of all commuters to the CBD, the lowest share of any U.S. city, but like drivers everywhere, they can choose to drive because they have access to parking at or near their places of work.

A 2007 survey found that in the New York CBD, where the median, non-discounted price of an off-street, unreserved parking space is $42 per day in Midtown and $34 per day in Downtown, 53 percent of motorists reported that they do not pay for their parking space. The 53 percent includes those who receive subsidized or free parking from their employers, those who are reimbursed for their parking fees by their employer or someone else, and those who park in unmetered spaces on residential streets in the CBD.

Of the remaining 47 percent, five percent of motorists reported parking on the street in a metered space. The remaining 42 percent reported parking off-street in a private or municipal garage or lot and presumably paid market rates for parking (not to mention the time they spent in congestion when entering and leaving the CBD, the wear and tear on their vehicles, and perhaps even the tolls they paid in each direction).

Commuters are not the only category of motorists who drive into New York’s CBD. Whether these vehicles are traveling to the CBD on business (for example,

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1 New York Metropolitan Transportation Council (2007).
2 As cited by Schaller (2006a), page 45. At an average vehicle occupancy of 1.4 persons per vehicle, this translates to 194,000 vehicles.
3 Colliers International’s 2007 Parking Survey. The median monthly parking rate was found to be $630 in Midtown and $500 Downtown. In surveys, the median daily price paid has been found to be as low as $24.42 because motorists take advantage of early-bird specials and weekly and monthly contracts where possible.
4 Schaller (2007), page 1. A 1995 study of three areas of the CBD found that 45 percent of drivers were partly or fully reimbursed for the cost of parking (Falcocchio, 1995). A 2004 telephone survey of Trans-Hudson drivers by found that 40 percent of New Jersey drivers paid for parking themselves, while employers paid parking costs for 15 percent of drivers, others paid the costs for 5 percent, and 33 percent of drivers reported that their parking was “free” (University Transportation Research Center, 2005).
to deliver or pick up goods from a CBD location), to shop, visit a tourist attraction, visit a friend or relative, conduct personal business, or return to their home in Manhattan, they need a place to park. All of these vehicles contribute to congestion in and around the CBD.

This report provides an overview of various categories of motorists who park in the CBD, introduces a range of parking-related measures that New York City might implement to make the option of driving into the CBD less attractive, estimates the potential impact of several of these measures on congestion in the CBD, and discusses other potential impacts of each measure on various stakeholder groups such as CBD residents.

Some of these strategies may be effective in diverting some auto trips to other modes. However, due to the extremely high demand for travel to and through the CBD, it is possible that the congestion reduction benefits of a particular parking strategy could be partially or completely offset by latent demand for through trips and other types of trips that use CBD streets (and the roadways leading to the CBD) but do not park. Estimates of VMT reduction cited in this report account for parking-related VMT only and do not consider latent demand.

Among the key findings of the study are the following:

- In terms of reduction in vehicle-miles-traveled (VMT), increasing rates for on-street metered parking could be among the most effective parking-related strategies analyzed in this paper. “Increasing rates” implies a rate structure that would encourage regular turnover of spaces such that at any given time, about 15 percent of spaces are free (approximately 3 spaces per crosstown block if all spaces on the block are metered, or fewer if there is a mix of metered and unmetered spaces). The vacancy rate cuts down on traffic circling the block in search of parking and encourages turnover of parking spaces so that they can be used by short-term visitors rather than all-day workers. Because it reduces parking search as well as overall trips into the CBD, this strategy has the double benefit of reducing VMT and traffic congestion. To be most effective, it could be implemented in conjunction with a residential parking permit system to prevent spillover from metered to unmetered streets.

- Accounting for reduction in traffic circling the block and a reduction in trips entering and leaving the CBD, implementation of increased on-street parking rates could reduce VMT by about 14,000 miles per day, about one half percent reduction from current levels.

- Other strategies to increase the price of parking in the CBD would have only a modest impact, and some may even increase VMT. Eliminating the discount for Manhattan residents on the off-street parking tax may reduce VMT; however, if parking garage operators simply absorb the tax increase and keep garage prices constant, there would be no effect on drivers and no change in VMT. The elimination of the parking tax discount may be the easiest strategy to implement, given that the infrastructure and regulatory
framework for a parking tax is already in place, but there is a possibility that the tax increase could simply reduce operator revenues with no reduction in VMT.

- An estimated 42 percent of motorists who park in the CBD pay the full cost of off-street parking out of their own pocket. Some of these motorists can deduct the cost of parking as a business expense, but still pay a substantial share of the cost out of pocket even when the tax break is considered. The elimination of the parking tax discount might not be equitable because Manhattan motorists who currently pay for parking would be forced to pay more (unless parking lot operators simply absorb the tax), while the “free” parkers would continue to be subsidized. An elimination of the parking tax discount may even persuade some drivers to join the ranks of “free” parkers, increasing VMT as they cruise in search of an open unmetered space where they can park for the day.

- An alternative may be to devise a method of influencing employers who provide free parking rather than taxing the individual consumers, but it is not clear if the VMT implications would be any different. About 34 percent of motorists receive free off-street parking from their employer, are reimbursed for the cost of parking by their employer or others, or have one of 20 categories of government-issued placards or permits that enables them to park for free in designated off-street spaces throughout the CBD. Motorists who have a guaranteed, reserved parking space at no cost are the most difficult to dissuade from driving into the CBD. New York City could attempt to implement a variety of measures to accomplish this goal, including taxing company-owned parking spaces directly, taxing parking benefits as income (which would have little or no impact on VMT or mode choice), encouraging or requiring employers to give their employees the cash equivalent for their parking benefit (which would produce a VMT reduction of approximately 1,020 miles per day), or restricting distribution and use of off-street parking placards.

- Initiatives that discourage parking in New York’s CBD would impact vehicle trips ending in the CBD. Through traffic would be unaffected, however. It is even possible that some of the excess capacity freed up by trips that formerly were destined for the CBD could be absorbed by new through traffic. Given that through auto traffic as a percentage of total auto traffic at Hudson River Tunnels and East River Crossings ranges from 30 to 60 percent, the City may wish to study potential impacts on through traffic before parking policies are implemented in New York.

- Options for further restricting already scarce and expensive parking in Central London were considered insufficient to reduce congestion to targeted

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5 Schaller (2006a), pages 36 and 37.
levels given that through traffic was approximately 30 to 40 percent of all traffic in Central London before congestion pricing was implemented there.\textsuperscript{6}

\textsuperscript{6} Booz, Allen and Hamilton (2006), page 23.
1.0 Introduction

On any given workday, the Manhattan Central Business District (CBD) hosts nearly two million workers from around the region, hundreds of thousands of tourists, and several hundred thousand residents. Streets are congested with cars, trucks, buses, taxis, pedestrians, and cyclists. The saturated roadways slow bus service, cause emergency vehicles to lose valuable response time, and contribute to the region’s air pollution problems.

According to Texas Transportation Institute’s Urban Mobility Report, the New York region ranks second in the nation in terms of annual delay. The majority of the delay is spent during the peak hour, with travelers experiencing 46 hours of annual delay (per traveler) in 2005, up from 34 hours in 2000, a 35 percent increase. This congestion costs the region and its residents over $7 billion in 2005, costing each peak traveler approximately $888.

By 2030, nearly a million more residents, 750,000 more jobs, and millions more visitors are expected to further strain the City’s transportation system. The current system cannot handle the anticipated increase in traffic and meaningful infrastructure-based solutions are challenging, costly, and lengthy to implement. During a typical weekday in 2005, about 800,000 autos, taxis, trucks, and vans were estimated to have driven into Manhattan below 59th Street, the area typically regarded as New York’s CBD. Census data from 2000, the most recent year available, indicate that more than 274,000 people chose to drive to work in New York’s CBD on a typical weekday that year. These drivers make up about 16 percent of all commuters to the CBD, the lowest share of any U.S. city, but like drivers everywhere, they can choose to drive because they have access to parking at or near their places of work. In many cases parking is provided at no cost to these commuters, or is subsidized by their employers or U.S. taxpayers. Research into the effect of parking availability on mode choice has made clear the connection between the cost of parking and the choice of auto for a commute.

A 2007 survey found that in New York’s CBD, where the median price of an off-street, unreserved parking space is $42 per day in Midtown and $34 per day

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7 New York Metropolitan Transportation Council (2007).
8 As cited by Schaller (2006a), page 45.
9 See, for example, Hensher (1999), Hess (2001), and Jansson (2002).
in Downtown,\textsuperscript{11} 53 percent of motorists do not pay for their parking space, for the following reasons:

- Their employers provide a space in an off-street garage or lot as a benefit, or they work on-site at a construction site with available parking (10 percent). About 26 percent of motorists who park off-street for free (or 2.6 percent of all motorists surveyed) reported having parking provided by a government agency;

- They are reimbursed for the cost of parking by their employer or others (24 percent); or

- They park for free at an unmetered space on a Manhattan street (19 percent). Six percent of motorists who parked on-street in unmetered spaces (or just over one percent of all motorists surveyed) reported using a government-issued placard. However, due to the locations where surveys were conducted, the number and share of placards may have been underestimated.

Five percent of motorists reported parking on the street in a metered space. Over the average duration of their stays, they paid about 14 times less than the fees paid by off-street parkers. It is assumed that most motorists who choose to park in a metered space do so for a limited amount of time and are not commuting to work in the CBD.

The remaining 42 percent of motorists reported paying for their own off-street parking in a garage or lot and presumably paid market rates for parking. Included in this amount are motorists who are self-employed and can deduct business-related expenses, such as the cost of parking, on their income tax forms, thus reducing their net income and their associated tax burden. Self-employed motorists have partially subsidized parking costs, but the amount of the tax break is insignificant with respect to its impact on their mode choice decisions, as described later in this report.

Commuters are not the only category of motorists who drive into New York’s CBD. Whether these vehicles are traveling to the CBD on business (for example, to deliver or pick up goods from a CBD location), or to shop, visit a tourist attraction, visit a friend or relative, conduct personal business, or return to their home in Manhattan, they need a place to park. All of these vehicles contribute to congestion in and around the CBD.

Whether motorists pay for parking directly, indirectly, or not at all, the City has many parking-related policy options for discouraging them from driving into the

\textsuperscript{11}Colliers International’s 2007 Parking Survey. The median monthly parking rate was found to be $630 in Midtown and $500 Downtown. In surveys, the median daily price paid has been found to be as low as $24.42 because motorists take advantage of early-bird specials and weekly and monthly contracts where possible.
CBD. A combination of strategies may be most effective at diverting a large percentage of auto trips to other modes.

This report provides an overview of various categories of motorists who park in the CBD, introduces a range of parking-related measures that New York City might implement to make the option of driving into the CBD less attractive, estimates the potential impact of each of these measures on congestion in the CBD, and discusses other potential impacts of each measure on various stakeholder groups such as CBD residents. The remainder of the report is organized into the following sections:

- **Section 2.0, Analytical Framework**, answers the question “Who Parks in the CBD, and Why?” The section summarizes the various categories of CBD-bound motorists in terms of their parking options and describes the existing regulatory and economic framework (city parking regulations, average parking fees in the CBD, access to placards, availability of free on-street parking, etc.) in which motorists make their parking and mode choice decisions;

- **Section 3.0, Case Studies**, lays out the menu of parking-related measures available to New York City, based on the city’s own past experiences and the experiences of other cities around the world;

- **Section 4.0, Applications to New York City**, explores the degree to which each of these measures could reduce congestion in and around the CBD and lays out issues that need to be addressed when implementing any or all of the proposed parking-reduction measures;

- **Section 5.0, Key Findings and Conclusions**, summarizes key findings; and

- **Section 6.0, References and Sources of Additional Information**, contains additional information and sources that may be useful for more detailed consideration of any of the recommendations or findings of this report.
2.0 Analytical Framework

2.1 Who Parks in the CBD, and Why?

This section will explore each of these categories of motorists outlined in the introduction in more detail. Table 2.1 contains a summary of the categories and establishes a nomenclature that will be used throughout the remainder of this report.

<table>
<thead>
<tr>
<th>Category</th>
<th>Includes motorists who:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subsidized off-street</td>
<td>Are provided parking for free or at a significantly reduced cost by their employers, or are self-employed, and thus are able to partially deduct the cost of parking from their income taxes as a business expense</td>
</tr>
<tr>
<td>Unmetered on-street</td>
<td>Search for and find parking at an unmetered space on a street in the CBD</td>
</tr>
<tr>
<td>Metered on-street</td>
<td>Search for and find parking at a metered space on a street in the CBD</td>
</tr>
<tr>
<td>Paid off-street</td>
<td>Park off-street in a lot or garage and pay market rates</td>
</tr>
<tr>
<td>Placard (on-street or off-street)</td>
<td>Have been issued one of 20 categories of parking permits or placards by a Federal, state, or local government agency, and park either off-street or in unmetered on-street spaces. Placard parkers are a subset of the &quot;Subsidized off-street&quot; and &quot;Unmetered on-street&quot; categories.</td>
</tr>
</tbody>
</table>

Figure 2.1 shows the distribution of motorists who park in the CBD, according to a 2007 survey.¹²

¹²Schaller (2007).
2.2 **SUBSIDIZED OFF-STREET PARKING**

Some Manhattan businesses reimburse their employees for all or a substantial part of their daily parking expenses, whether they are commuting to their office or traveling for business. The parking reimbursement may be negotiated into an employee’s contract or may be provided as a fringe benefit as a matter of company policy. It is common practice for firms doing business in the city on a contractual basis to negotiate reimbursements for parking expenses and other business-related expenses into their contracts with their clients. Approximately 24 percent of motorists driving into the CBD to park are reimbursed by their employers for the expense.
Some businesses own parking spaces in or near their buildings and reserve these spaces for their employees’ use. The spaces may be incorporated into the firm’s lease, in which case it is difficult to determine the true cost of the space. Large construction sites in the CBD have off-street parking spaces reserved for some or all construction workers’ private vehicles, in addition to spaces reserved for construction vehicles and equipment. Approximately 10 percent of motorists park in these reserved spaces.

As will be discussed below, some motorists driving vehicles with government-issued placards are permitted to park off-street in reserved spaces. It is estimated that one-quarter or more of motorists that park off-street in the CBD for free, or six percent or more of all motorists, have a placard or permit. These motorists will exhibit characteristics similar to other subsidized off-street parkers.

In any of these cases, the person doing the parking does not ultimately pay for all or some part of the parking. The subsidy artificially reduces the cost of parking, in some cases to zero, which makes the demand for parking among this group very inelastic. Virtually no city policy involving parking price increase will have an effect on this group’s decision to drive into the CBD. Therefore for parkers in this group, solutions involving other types of financial incentives (excluding price increases) will be explored in Sections 3 and 4.

### 2.3 On-Street Parking

Nearly one in five motorists entering Manhattan’s CBD reported parking in one of 22,100 unmetered spaces on the street, meaning they paid nothing for parking. Unmetered spaces are used by all types of vehicles throughout the day and night, but many are occupied during business hours by commuters who:

1. Drive into the city in the morning peak, thus contributing to congestion on routes used to access the CBD;
2. Circle the blocks of unmetered residential streets in the CBD in search of an available space, thus contributing to congestion within the CBD; and
3. Successfully find an available unmetered space.

Parking spaces on residential streets are often occupied by vehicles belonging to CBD residents. A number of these residents commute to jobs outside the CBD and vacate their spaces during the day, opening them up for CBD-bound commuters.

The five percent of motorists who do pay for on-street parking in one of 6,900 metered spaces in the CBD pay an average of $1.73 for the duration of their stay,
about one-fourteenth what off-street parkers pay in the CBD.\textsuperscript{13} Motorists who use metered space are much less likely to be commuters (since parking for eight hours is difficult if not impossible at most meters) and much more likely to be shopping, on personal business, or on other short trips.

In his book \textit{The High Cost of Free Parking}, Donald Shoup discusses the implications of underpricing on-street parking. In Shoup’s opinion:

\begin{quote}
“Underpricing curb parking is no fairer than giving discounts on other public services merely on the basis of chance. Everyone would be outraged, for example, if cities allocated public housing on a first-come, first-served basis to anyone who wanted it, even to a rich miser. Allocating curb parking by cruising (circling the block searching for a free space) is not only unfair (in the sense that it randomly rewards a few lucky drivers), but it also wastes drivers’ time and increases traffic congestion. Curb parking is a valuable public asset, and underpricing it is fiscally, socially, and environmentally irresponsible.”\textsuperscript{14}
\end{quote}

Shoup argues that curb parking is not a public good, contrary to popular opinion, and advocates for cities to charge high enough prices for on-street parking that approximately one space in seven or eight remains vacant at all times (a vacancy rate of about 15 percent). He contends that “the cushion of vacant spaces eliminates the need to cruise,” or circle the block searching for a free space. Cruising for parking is a significant source of traffic in congested areas. In a 2006 survey of drivers on Prince Street in SoHo, 28 percent of drivers said they were searching for parking.\textsuperscript{15} Another study completed in 2007 found that 45 percent of drivers on Seventh Avenue in Park Slope, Brooklyn, were searching for a parking space.\textsuperscript{16}

Section 3 will present case studies of other cities around the world that have increased on-street parking rates and experimented with variable time-of-day pricing for on-street parking. Section 4 will discuss the potential impacts of these measures on parking and traffic congestion in New York City.

### 2.4 Paid Off-Street Parking

According to a recent study, 38 percent of CBD parkers personally paid their parking fees at off-street garages and lots. An additional four percent of motorists parking in the CBD report that they can deduct the cost of parking as a

\begin{footnotes}
\textsuperscript{13}Ibid.
\textsuperscript{14}Shoup (2005), Page 313.
\textsuperscript{15}Schaller (2006b).
\textsuperscript{16}Transportation Alternatives (2007).
\end{footnotes}
business expense, but, as will be explained below, the cost savings realized through this deduction are probably not significant enough to alter mode choice decisions.\textsuperscript{17} The motorists who were surveyed reported that they paid an average of $24.42 per day to park in the CBD.\textsuperscript{18}

More than four out of five motorists parking in a garage in the CBD claimed to have paid the daily rate, as opposed to a weekly or monthly fee that would offer a discount, suggesting that they do not drive into the CBD every day.\textsuperscript{19} There are many potential reasons for this behavior, including:

- Telecommuting;
- Splitting time between a suburban office and a CBD office;
- Frequent business travel that requires days out of the office; or
- Perhaps the most common reason, a business-related trip (such as a meeting away from the office) or a personal trip (such as a doctor’s appointment) that is chained with the commute trip at the beginning, middle, or end of the work day and therefore increases the attractiveness of driving over other modes on that particular day.

Motorists who pay for their own parking may benefit from Federal tax breaks for commuter-related parking expenses. Under Section 132(f) of the Federal tax code, employees may elect to withhold up to $215 per month from their gross (pretax) salary to pay for commute-related parking expenses. Businesses benefit from the FICA-related\textsuperscript{20} savings associated with their employees’ pre-tax withholdings. The benefits of this program are somewhat modest, however, when one considers that even at the highest Federal tax bracket of 35 percent, this would result in savings of just over $900 per year in Federal taxes, in addition to smaller state and city tax savings, depending on place of residency. Assuming a monthly parking fee of $537 (the daily rate of $24.42 multiplied by 22 business days per month), the annual tax savings would amount to about $645 per year for a person with a moderate income, a little more than one month of free parking or 10 percent of the total annual parking costs of $6,447. Table 2.2

\begin{itemize}
  \item Schaller (2007).
  \item Ibid.
  \item Ibid. The 82 percent of motorists who paid the daily rate as opposed to a discounted monthly or weekly rate includes those in the “market-rate off-street parking” group and those in the “subsidized off-street parking” group.
  \item Federal Insurance Contributions Act, which governs Social Security and Medicare payroll taxes. Section 132(f) withholdings reduce an employee’s gross salary for purposes of calculating FICA-related taxes, which are then split evenly between employers and their employees. Thus, employers can realize modest financial benefits by encouraging their employees to use Section 132(f) withholdings.
\end{itemize}
contains examples of calculations for a lower-tax-bracket commuter (Person A) and a higher-tax bracket commuter (Person B).

### Table 2.2 Potential Tax Savings with Pre-Tax Withholding for Two Income Levels and Two Parking Locations

<table>
<thead>
<tr>
<th>Without Paycheck Withholding</th>
<th>Person A</th>
<th>Person B</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annual salary</td>
<td>$60,000</td>
<td>$240,000</td>
</tr>
<tr>
<td>Monthly gross income</td>
<td>$5,000</td>
<td>$20,000</td>
</tr>
<tr>
<td>Federal income tax rate</td>
<td>25%</td>
<td>35%</td>
</tr>
<tr>
<td>Monthly Federal income tax</td>
<td>$1,250</td>
<td>$7,000</td>
</tr>
<tr>
<td>Annual Federal income tax</td>
<td>$15,000</td>
<td>$84,000</td>
</tr>
</tbody>
</table>

| With Paycheck Withholding:|
|---------------------------|----------|----------|
| Annual salary             | $60,000  | $240,000 |
| Monthly gross income      | $5,000   | $20,000  |
| Monthly pre-tax paycheck withholding for parking | $215 | $215 |
| Adjusted gross income     | $4,785   | $19,785  |
| Federal income tax rate   | 25%      | 35%      |
| Monthly Federal income tax| $1,196.25| $6,924.75|
| Annual Federal income tax | $14,355  | $83,097  |
| Annual Federal income tax savings | $645 | $903 |
| Monthly parking fee        | $537     | $537     |
| Annual parking fee         | $6,447   | $6,447   |
| Tax savings as percentage of parking cost | 10% | 14% |

Those who are self-employed may be eligible to deduct 100 percent of the cost of parking as a business expense when calculating their net income for income tax purposes but, similar to the calculation above, the actual savings as a percentage of total parking costs are, at most, equal to a person’s marginal income tax rate. Therefore, although their costs may vary slightly, for purposes of this discussion, self-employed parkers are treated like others who pay the full cost of off-street parking.

Regardless of their reason for driving into the CBD, of all the categories of parkers analyzed in this report, those who pay out-of-pocket for off-street spaces are among the most susceptible to price increases (Motorists who park in metered and unmetered on-street spaces are also price-sensitive and will be discussed separately below). Various increases in the cost of parking may cause some share of this group to shift from auto commuting to another mode.
Section 3 discusses methods other cities have used to increase the price of off-street parking, and Section 4 contains a discussion of the price elasticity of demand for parking in New York’s CBD and potential ways for the city to take advantage of pricing strategies that discourage parking.

## 2.5 Placard Parking

New York City government agencies, the State of New York, and the Federal government all issue parking permits to certain employees that enable them to park their personal vehicles for free in designated areas. Additionally, many agencies own their own vehicles for official use that are driven in and around the CBD during peak periods. In all, there are more than 20 categories of legal placards and permits, plus a variety of unofficial and illegal placards, such as those issued by unions. The categories of legal placards are summarized below:

- Clergy;
- Corrections-Union;
- Court Officer;
- Court Clerk;
- Disability (SPI);
- DoE Teacher’s Permit;
- DOT Agency Business Parking Permit (three-hour limit);
- FDNY (not UFA permits);
- FDNY Union – UFA;
- NYPD – Unrestricted;
- NYPD – Restricted;
- Official Business – City of New York;
- Official Business – State of New York;
- Police – Department Investigation;
- Police – District Attorney;
- Police – Federal Law Enforcement;
- Police – State of New York (NYSPD);
- Press;
- USPS; and
- Other.
Figure 2.2 shows an example of a New York Press license plate and a sign designating one side of a street for vehicles with placards.

Figure 2.2  New York Press License Plate and Related Regulatory Signage

According to 2000 Census Journey to Work data, 33 percent of government workers in Manhattan’s CBD drive to work. Government workers are more than twice as likely to drive to work in the CBD as private sector finance, real estate, and professional service workers, a group whose median income is several times higher. The vehicles they drive may be official government vehicles or their personal vehicles. Some employees need their vehicles throughout the day to attend meetings or conduct field visits, explaining their need for a parking permit. Others with placards include members of the clergy who may need to visit a hospital; ambulances; court officers; and teachers who need a parking space near their school.

There are no reliable data available on the number of government placards issued and to whom they were issued. Each government agency is responsible for setting its own criteria for issuing placards and tracking their distribution and use. Section 3 discusses an approach used by the Federal government to reduce demand for government worker parking in Washington, D.C.
3.0 Case Studies

Section 2 laid out the types of motorists who park in New York City’s CBD and suggested reasons why each of these groups chooses to drive into the CBD to park instead of using other modes. This section introduces several examples of potential strategies that discourage parking in the CBD. The strategies are presented as a series of case studies from several cities around the globe that have addressed the problem and may provide lessons for New York City. Table 3.1 summarizes the case studies presented in this section.

### Table 3.1 Case Studies of Strategies to Discourage Parking in CBDS

<table>
<thead>
<tr>
<th>Area</th>
<th>Strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boston, Massachusetts, USA</td>
<td>Parking Freeze in downtown Boston and two other neighborhoods limits growth in supply of off-street parking. Resident Permit Parking Program restricts unmetered on-street parking to CBD residents.</td>
</tr>
<tr>
<td>San Francisco, California, USA</td>
<td>Imposed 25% ad valorem tax on all commercial, off-street, non-residential parking transactions.</td>
</tr>
<tr>
<td>Redwood City, California, USA</td>
<td>Meter prices increased to market rates to encourage turnover of spaces, increase space vacancy rate, and reduce demand for cruising for parking.</td>
</tr>
<tr>
<td>Canada, Sweden and Australia (all cities nationwide)</td>
<td>Employer-provided parking treated as a taxable fringe benefit.</td>
</tr>
<tr>
<td>California cities in air quality non-attainment areas</td>
<td>Parking “cash out” program provides employees the option of receiving either a free parking space or a cash payment equal to the value of that space.</td>
</tr>
<tr>
<td>Washington, D.C., USA</td>
<td>Government employees required to pay for parking that formerly was free.</td>
</tr>
</tbody>
</table>

3.1 **BOSTON PARKING FREEZE**

In 1976, the Massachusetts Department of Environmental Protection and the U.S. Environmental Protection Agency (EPA) agreed on a new set of rules to limit the availability of commercial parking spaces in downtown Boston “to discourage automobile use in downtown Boston, to reduce vehicle miles traveled in the region, and to encourage and develop greater use of public transit.”

The downtown “parking freeze” capped at 35,556 the number of public parking

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21City of Boston Air Pollution Control Commission (1978), page 13.
spaces in commercial off-street facilities in Boston’s CBD (see Figure 3.1). In order for new commercial parking to be built, spaces must be eliminated elsewhere in an amount equal to the number of new spaces being created. The freeze only applies to commercial off-street parking that charges a fee to the general public. Residential parking spaces are exempt, as are spaces reserved for the use of a building’s employees, customers, and guests. This remains the longest-lasting parking freeze ever implemented by the U.S. EPA.22

Each year, the Boston Air Pollution Control Commission (APCC) inventories parking spaces in the zone covered by the freeze. If the current number of spaces does not exceed the capped number of spaces allowed in Boston’s CBD, the excess spaces are added to a “parking freeze bank.” Property developers must apply to the APCC for a permit to add new parking spaces in the freeze zone. The permit will only be granted if spaces are available in the bank, unless the parking spaces qualify for an exemption as described above.

Between 1977 and 1997, the total number of parking spaces in the freeze area increased by nine percent (primarily due to qualifying exemptions), while the number of employees downtown increased by 15 percent. After adjusting for inflation, long-term (daily) parking fees nearly doubled over this same period, as can be expected when demand exceeds supply.23 Between 1970 and 1990, the percentage of commuters entering Boston’s CBD by non-auto modes increased from approximately 47 percent to 54 percent. Transit mode share increased from approximately 32 percent to 39 percent. These increases can be explained in part by the parking freeze, and also by the fact that Boston saw significant transit upgrades and extensions of existing lines with virtually no highway improvements. In more recent years, disruptions caused by the Central Artery/Tunnel project (the “Big Dig”) may have been responsible for continued maintenance of transit mode share in the region.

To discourage auto commuters from attempting to find free parking on streets in residential areas near the CBD, the City of Boston instituted a residential parking permit (RPP) program in addition to the parking freeze. The RPP program originally was implemented in areas near the CBD facing high competition between residents and commuters for parking, a problem that predated the freeze. As the freeze accelerated the expansion of commuter demand for parking to neighborhoods outside the CBD, the RPP program was expanded to cover 16

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22 New York City implemented a parking moratorium from 1973 to 1981 in response to a similar EPA mandate that the city improve its air quality to comply with the Clean Air Act. The parking moratorium lasted until 1981, when a new set of rules reducing the number of accessory parking spaces allowed in new buildings and conversions and restricting the size and location of freestanding parking structures and lots went into effect for Midtown and Downtown. Most new parking in Manhattan today requires approval of the City Planning Commission.

neighborhoods inside and outside the CBD, including transit station areas (where commuters began to park and take a short ride to the CBD) and the area surrounding Fenway Park. The RPP program is now viewed as an essential component of Boston’s overall parking supply management program.

**Figure 3.1 Map of Limits of Boston Parking Freeze**


A South Boston Waterfront parking freeze, covering parking lots within walking distance of the CBD in an area with a rapidly developing commercial office market, went into effect in 2004. A freeze in East Boston, covering commercial and employee parking at Logan Airport, as well as park-and-fly parking spaces
and rental motor vehicle parking spaces at nearby businesses serving Logan Airport, was instituted in 1989. These zones are covered by regulations similar to those in the CBD zone, but are administered separately. The South Boston parking freeze covers all types of spaces, not just commercial public spaces as in the downtown. It is too early to tell the impact that this freeze will have on this rapidly evolving area.

One negative impact of the Boston CBD parking freeze has been the limited availability of short-term parking for CBD visitors on non-commute trips, such as retail, recreation, and entertainment trips. Available spaces tend to be marketed primarily to longer-term commuter parkers due to the financial benefits of having a consistent and dependable stream of revenue via monthly parking contracts. Short-term parking rates, as a result, tend to be extremely expensive (well over $20 for one to two hours of parking). The Boston Convention and Visitor’s Bureau, which owns a large underground parking garage under Boston Common, recently has proposed increasing the size of the garage, and thus the number of spaces controlled by the parking freeze, to better accommodate visitors to the CBD.

### 3.2 San Francisco Parking Tax

In October 1970, San Francisco instituted a 25 percent tax on all public and private off-street parking in the city. Residential spaces were exempt, and rates were unchanged for metered spaces. The tax forced the largest citywide rate increase in San Francisco’s history and had a dramatic and measurable effect on travel patterns in the city. Two years later, in response to public outcry, the rate was reduced from 25 percent to 10 percent. In the meantime, the rate changes provided an ideal test bed for the effects of parking price increases.

A 1974 study\(^{24}\) estimated elasticities of demand for parking with respect to price\(^{25}\) at 13 municipal garages and 10 surface lots in San Francisco, using data from before and after the 25 percent parking price increase at all publicly-available parking in the city. Across all types of travelers, an average price elasticity of -0.3 was observed, indicating a 0.3 percent reduction in demand for parking for every 1 percent increase in parking price. CBD travel was estimated to drop by 2 percent, but the study author was not able to make a clear connection between the parking tax increase and a reported decrease in the growth of traffic crossing the Golden Gate Bridge.


\(^{25}\)The elasticity of demand with respect to price describes the sensitivity of motorists to increases in the price of parking. For example, an elasticity of -1.0 indicates that a one percent increase in the price of parking causes a one percent reduction in the demand for parking.
At the peak of the parking tax, when the rate was set at 25 percent, the parking operators’ net revenues were estimated to have fallen 36 percent, compared to their projected revenues had the tax not been imposed. The estimated losses incurred by operators exceeded the revenue generated from the tax by San Francisco government, raising questions about the economic efficiency of the tax.

### 3.3 Canadian, Swedish, and Australian Taxes on Parking Benefits

Section 2 described the many New York City CBD parkers who receive a free parking space as a fringe benefit from their employers. In Canada, Sweden, and Australia, these benefits would be taxed as income. In practice, the tax has proven difficult to enforce. Revenue Canada (the Canadian counterpart to the IRS) provides many exemptions that render the parking benefit tax moot, and Sweden and Australia find compliance rates are low and enforcement too expensive to be worthwhile. In fact, in Sweden, public opinion surveys found that one of the key objections to the congestion pricing program in Stockholm was a prediction that those with company cars would not have to pay the congestion fee, based on a history of lax enforcement of the parking levy.  

In Canada, the value of parking benefits is assessed at the fair market value of parking in the area surrounding the employee’s parking space. Employees that require the use of their vehicle for daily job functions are not required to pay the tax. Exemptions also are granted in the case when employers find it difficult to determine the fair market value of the space (in which case the value is assumed to be zero), or when the space is in an open lot shared by multiple employees (as is the case with most parking lots), as opposed to being specifically assigned to the employee.

In Sweden, any benefits in kind, including use of an employer-provided car, fuel used for that car, and any travel to and from work meetings that are reimbursed by an employer, including parking, must be reported as taxable income. Employers are required to provide the registration number of the employer-provided car for verification by the Swedish Tax Agency. The agency reports that compliance rates are low.

The Australian Taxation Office requires assessment of a tax on car parking fringe benefits only when there is a parking lot within one mile of the employee lot that charges a rate above a monetary threshold that increases annually. If there is no pay parking lot within one kilometer, the space is assumed to have zero market value and no tax is assessed. The tax is assessed on the employer on a daily basis, prorated for the number of days the space is used each year. The car must be parked for more than four hours between 7 a.m. and 7 p.m., it must be under

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26 Swedish National Road Administration (2003).
the control of or leased to the employee, it must be parked at the employee’s primary place of employment, and it must be used for at least one trip to or from the employee’s home that day.

Studies published by the Swedish cities of Göteborg and Stockholm predicted that strictly enforcing the country’s existing parking benefits tax law could reduce car traffic by between five and 10 percent in Göteborg and 13 and 17 percent in Stockholm. In the City of Stockholm, the potential for increased tax revenue is estimated at 60 million Swedish Kronor (approximately U.S. $9 million) per year. Nationwide, potential revenues were estimated at 150 million Kronor (U.S. $23 million) annually.27

3.4 CALIFORNIA PARKING “CASH-OUT”

In 1992, after Congress passed the 1990 Clean Air Act Amendments, California enacted legislation requiring many companies in air quality non-attainment areas to offer their employees a cash allowance in lieu of a subsidized parking space. The reasoning behind the law was that if offered cash, employees might consider other alternatives, such as biking, using transit, or carpooling, rather than driving alone to work. Firms whose parking was unbundled from their building lease found the initiative appealing because it allowed them to release unused spaces back to their landlord, saving money. Firms who owned their own parking in areas where parking supply was limited could generate revenue by leasing unused spaces to other firms or to the public.

Parking cash-out does not increase the cost of parking. Instead, it increases the benefit of not parking. There are tax implications for both employers and their employees, however. Employees who choose to receive a parking cash-out payment in lieu of a parking space see an increase in their gross pay, which affects Social Security28 and Medicare taxes (which are split between the employee and the firm) as well as income taxes (which are paid by the employee). As an alternative, employees may continue to receive the free parking space with no change in their compensation, and no consequences to the firm or any other employees.29

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27 Office of Urban Transportation, City of Göteborg (2005), and Office of Regional Planning and Urban Transportation, Stockholm County Council (2003).

28 Workers pay Social Security taxes only on the first $90,000 in income. An employee with a salary over $90,000 would not see any increase in Social Security taxes as a result of taking a parking cash-out payment, but would see an increase in Medicare taxes.

29 Prior to 1998, the Internal Revenue Service ruled that if an employer offered parking cash-out to any employee, all parking benefits to all employees would be taxable. An act of Congress overturned that ruling, and since 1998 parking cash-out has had no tax consequences for employees who do not elect to receive the benefits.
Today, parking cash-out is considered a success at those firms that implemented the initiative, but implementation has not been as widespread as some had initially hoped. A study of eight employers who implemented parking cash-out after 1992 found that the share of commuters driving alone to work fell from 76 percent to 63 percent across all firms. One firm in Downtown Los Angeles with relatively high parking costs saw the share of solo drivers plunge from 75 percent to 53 percent with parking cash-out, while firms in Santa Monica and West Hollywood, where parking was cheaper and thus the cash-out less attractive, saw more modest decreases in solo driving (from 72 percent to 70 percent in the least favorable case). The share of commuters carpooling increased from 14 percent of all commuters to 22 percent across all firms. Transit use among employees of these firms increased from six to nine percent, while walking and biking shares increased about one percentage point and one tenth of a percentage point, respectively. Total vehicle miles traveled fell by five to 24 percent for the eight firms studied, with the largest decreases in Downtown Los Angeles. It is estimated that parking cash-out resulted in a savings of 1.1 million vehicle miles traveled.30

3.5 **Market Rate Parking Meters in Redwood City and San Francisco, California**

Redwood City, California, a suburb of San Francisco, has become a national example of best practices in parking management. San Francisco has conducted a pilot project involving market-rate meters in downtown.

As part of a downtown revitalization strategy, Redwood City set its parking meters to charge rates that would ensure a 15 percent vacancy rate, or about one available space out of every eight. The city also dedicated parking meter revenue to pay for improvements on each block where meters are installed.

Redwood City works with businesses and new developers to ensure that existing parking is used to the maximum extent possible and to limit the need for new parking. The City manages on-street and off-street parking to ensure sufficient availability at all hours of the day. The City has been successful at managing demand during regular business hours on weekdays and also on weeknights and weekends when visitors come to the downtown to attend shows and go shopping.

Before the current plan was implemented, Broadway, a main thoroughfare in downtown, had free parking, leading to congestion and competition for space, while nearby metered spaces (which also were a longer walk from businesses located on Broadway) sat empty. After implementing the highest parking meter rates (75 cents per hour) on Broadway, demand for parking was redistributed

30Shoup (1997).
throughout the downtown to side streets, surface lots, and nearby parking structures.

Redwood City has set rates for on-street parking at 25, 50, or 75 cents per hour, depending on demand on each street and each block (see Figure 3.2). Payment is made at pay and display meters, similar to New York City’s Muni-Meters. Commuters can purchase monthly permits for garages in the area. The simplicity of the rate structure and payment aids enforcement and compliance with parking regulations.

**Figure 3.2 On-Street Parking Meter Rates and Off-Street Rates in Redwood City, California**

![Downtown Parking Meter Rates](image)

Source: City of Redwood, California.

Revenue from the meters is returned to a redevelopment district surrounding the city center. Parking meter revenues funds sidewalk improvements, street cleaning, and police patrols. Redwood City took lessons learned in other communities to heart and avoided directing revenues to its general fund.
Instead, it built a relationship with the business community in the downtown redevelopment area and is working with them to ensure parking management is successful for the city’s residents, visitors, and businesses.

In light of Redwood City’s experience, San Francisco County Transportation Authority and the Port of San Francisco are studying the effects of raising on-street parking meter rates in downtown San Francisco. The Port recently conducted a pilot study involving 200 spaces that the agency controls in downtown San Francisco. The Port found through revealed-preference analysis that commuters were willing to pay up to $5 more per hour for on-street parking than current rates. The Port also estimated that demand, particularly in peak hours, is very inelastic: a 50 percent increase in rates yielded a 5 percent decrease in peak period occupancy, an elasticity of -0.1.31

3.6 CHARGING FOR AND PRIORITIZING USE OF GOVERNMENT EMPLOYEE PARKING IN WASHINGTON, D.C.

In 1979, the Federal government required Federal employees in Washington, D.C. to begin paying one-half of the prevailing rates at local garages in downtown Washington, D.C. Previously, employees were able to park for free in government-contracted lots and garages that were run by private entities. A study that compared drive-alone mode shares at government facilities to a sample of non-government control facilities found a one to 10 percent drop in auto commuting in central city areas and a two to four percent drop in outlying areas.32

The new pay-to-park requirement was accompanied by a Federal commitment to fund the Washington Metro, a new regional rail system. Since 1979, the various government agencies located in downtown Washington have limited the addition of new parking, and instead have promoted transit use among their employees as government has grown in size. In the closing weeks of his term in office, President Jimmy Carter issued Executive Order 12191, the Federal Facility Ridesharing Program, which required executive agencies to “actively promote the use of ridesharing (carpools, vanpools, privately leased buses, public transportation, and other multi-occupancy modes of travel) by personnel working at Federal facilities to conserve energy, reduce congestion, improve air quality, and provide an economical way for Federal employees to commute to work.”

31 San Francisco County Transportation Authority (2007), p 21.
32 Miller and Everett (1982).
The order also led to the establishment of guidelines for each Federal agency to assign priority to parking spaces in Washington and around the country. The Code of Federal Regulations contains the following guidance regarding the priority for reserved employee parking:

“Federal agencies must assign available parking spaces to their employees using the following order of priority:

a. Severely disabled employees (see definition in §102–71.20 of this chapter);

b. Executive personnel and persons who work unusual hours;

c. Vanpool/carpool vehicles;

d. Privately owned vehicles of occupant agency employees that are regularly used for Government business at least 12 days per month and that qualify for reimbursement of mileage and travel expenses under Government travel regulations; and

e. Other privately owned vehicles of employees, on a space-available basis.”

This is only one example of guidelines that have been established for government employee parking around the country. Outside Washington, D.C., the Federal government has attempted to locate offices in areas with good transit accessibility, limit availability of parking, and encourage ridesharing. These policies, along with the strict limitations on parking in downtown Washington, D.C., a high-quality service on the Washington Metro, high levels of traffic congestion in the Washington metropolitan region, and poor highway accessibility to Washington’s core, have shifted a large number of Federal government employee commute trips from auto to transit. An estimated 42 percent of rush hour commuters on Metro are Federal employees, who make up less than 14 percent of the region’s workforce.33

4.0 Applications to New York City

The case studies in Section 3 have identified several potential parking policies that New York City could implement in order to discourage travel by auto to the CBD. This section will discuss possible applications of each strategy within New York City’s unique regulatory and economic framework.

Some examples of measures that public agencies have taken to influence mode choice through parking policies may be applicable to New York. Options to be addressed in this section include:

- Freezing the number of parking spaces in various categories in the CBD at a set level and denying future applications for new parking unless other parking spaces are eliminated;
- Eliminating Manhattan residents’ parking taxes discount for off-street parking;
- Taxing off-street, subsidized parking benefits as income;
- Conducting outreach and incentive programs to encourage property owners and businesses to charge for parking, or to implement “cash-out” programs that offer the employee either a free or subsidized parking space or its equivalent cash value as a benefit;
- Raising the price of on-street metered parking and installing meters on streets in the CBD that currently have unmetered parking; and
- Reducing the number of government-issued placards.

Table 4.1 provides an overview of how each type of policy could impact each of the categories of motorists described in Section 2. A more detailed discussion follows.
Table 4.1  Impacts of Potential Parking Initiatives on CBD Motorist Categories

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Market-Rate, Off-Street</th>
<th>Subsidized Off-Street</th>
<th>Metered On-Street</th>
<th>Unmetered On-Street</th>
<th>Placard (On-Street or Off-Street)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking freeze</td>
<td>Total number of motorists remains constant, but auto market share declines in long-term</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eliminating Manhattan residents’ parking tax discount on off-street parking</td>
<td>High</td>
<td>Low-Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Taxing off-street subsidized parking as income</td>
<td>Low</td>
<td>Medium</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Parking cash-out</td>
<td>Low</td>
<td>Medium-High</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
</tr>
<tr>
<td>Increasing rates at on-street parking meters</td>
<td>Medium – potential for increased competition from metered parkers</td>
<td>Low</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
<tr>
<td>Reducing placard parking</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>Low</td>
<td>High</td>
</tr>
</tbody>
</table>

VMT impacts are estimated for each of these options, except for the change in taxes on off-street parking and reduction of placard parking. VMT impacts for these two alternatives will be estimated separately using the Best Practice Model (BPM).

4.1 PARKING FREEZE

New York City has had strict regulations on the provision of parking spaces in new developments in the CBD since the end of the parking moratorium in 1982. Most new developments and redevelopment projects in Manhattan south of 96th Street already require special approval of the Planning Commission to add new parking spaces, and most new spaces are added for resident “accessory” parking, as opposed to parking accessible to commuters.

Instituting a parking freeze, as has been done in Boston, could be a viable long-term approach to managing parking demand in New York City’s CBD. (There is some evidence, however, that the redevelopment of surface lots in the CBD to higher economic uses has resulted in a decline in parking spaces in recent years.) With a parking cap, it would be relatively easy to predict future demand for auto trips ending in the CBD, since the supply of parking spaces ostensibly would not
change. As the number of jobs in the CBD increases, demand for parking would increase, and prices would rise commensurate with demand.

The largest impact would be expected for the market rate off-street parking group, but effects would not be felt until (and unless) demand for parking grows substantially in the future, and even then only the additional trips would be impacted. Unless the parking cap is instituted as a parking reduction measure in the early phases, a parking freeze will have no short-term effect on demand for trips to the CBD, and it would have no short or long-term effects on through trips or trips by vehicles dropping off people in the CBD. In fact, one consequence of a parking freeze could be an increase in VMT if vehicles are forced to drive around the CBD in search of a free on- or off-street parking space.

A parking freeze would require a thorough initial inventory of all on- and off-street parking spaces in the CBD. Boston recently has needed to clarify its methodology for conducting the parking inventory, especially with respect to parking lots that lack marked spaces. New York City would need to have a thorough quality assurance/quality control process to ensure that all spaces and lots are counted accurately. After completing the initial inventory, the City would then need to assume the responsibility of tracking parking space deletions and reviewing applications for additional spaces when excess spaces become available. The City would need to track changes in ownership as well and determine how these changes would affect the parking space permits. Decisions would have to be made regarding the categories of spaces included in a freeze such as all, all commercial, commercial open to the public, residential, etc.

4.2 INCREASING TAXES ON OFF-STREET PARKING

Increasing taxes on off-street parking would primarily affect those drivers who currently pay for their own market-rate off-street parking. These drivers are not limited to commuters: visitors and those conducting business in the city may be affected as well. To the extent that the tax increase is high enough to be felt by companies that own parking spaces and provide them to their employees, there could be some impact on parkers in the subsidized off-street group, but for purposes of this discussion they are assumed to be immune to the tax increase.

An option that could be considered to increase taxes on off-street parking includes:

- Eliminate the discount for Manhattan residents. New York City currently has a two-tiered sales tax on parking. Manhattan residents who park their cars long-term and do not use the vehicle for business purposes pay
10.375 percent, while others pay 18.375 percent on the value of the parking fee.34

Elimination of the parking tax discount for Manhattan residents would reduce the number of drivers using off-street parking spaces. Assuming that these drivers chose to travel in the CBD by transit, increasing the tax would reduce VMT in the CBD. Any vehicle miles traveled reduction would be in the market rate, off-street category, since increasing the parking costs would have very little effect on the other categories of parkers. VMT impacts will be estimated separately for this alternative using the BPM.

It is also possible that the elimination of the discount would not reduce VMT. Parking operators in New York also might simply choose to absorb the cost of the tax, rather than pass it on to their customers, since the lowest-cost operating strategy appears to be to fill their lots as early in the day as possible with all-day parkers. The result of the elimination of the off-street parking tax increase could therefore be to reduce parking operators’ profits, with no reduction in travel demand or VMT.

4.3 TAXING OFF-STREET, SUBSIDIZED PARKING AS INCOME

For a variety of reasons, a tax on the value of off-street, subsidized parking would have a very small effect on people who get free parking from their employer. Only New York City residents pay city income taxes, and since the tax ranges from only 2.907 percent to 3.648 percent of income, the effect of the new parking benefit tax would be much smaller than a direct tax or fee increase that would raise the cost of parking.35

Using the same assumptions as in the previous example, if a worker’s parking costs increase by 3.648 percent per year, the daily VMT in the CBD could be reduced by an estimated 450 miles. The VMT reduction is calculated only for the portion of the trips inside the CBD. VMT for the remainder of these trips outside the CBD also would be reduced.

34 To qualify for the resident tax rate, Manhattan residents must submit an application to the New York City Department of Finance. Residents must park their cars for one month or longer, have the vehicle registered to a Manhattan address, and use the car exclusively for personal use.

35 To have a much greater effect on VMT, as has been the case in Sweden, Canada, and Australia, the State and Federal tax codes would have to be altered to treat parking benefits as taxable income, which in turn would increase total taxes significantly on those drivers who currently have an employer-provided parking space in the CBD. For purposes of this discussion, it is assumed that the tax change would be made by New York City only, and would affect New York City residents only.
The calculation, shown in Table 4.2, assumes the following:

- An estimated 194,000 personal vehicles park in the CBD as part of a daily commute each day.\textsuperscript{36} Only these commuter trips are assumed to be affected by the subsidized parking tax.

- A 2007 survey found that 24 percent of motorists parking in the CBD were reimbursed for the expense by their employers.\textsuperscript{37} The same survey found that approximately 50 percent of the motorists who park in the CBD live in New York City (and therefore pay New York City income tax).

- The elasticity of demand for parking with respect to price is assumed to be -0.3, based on the experience of San Francisco.\textsuperscript{38}

- Of those motorists who are discouraged from parking in an off-street space by the tax increase, about one in five would continue to drive into the CBD, but would find another place to park (for example, in an on-street space).

The city will have to address several issues if this initiative is implemented. First, it will be difficult to put a dollar value on the benefit provided by a free parking space. The average price of parking in the CBD, or in a subsection of the CBD, or in the particular garage where the space is located, would have to be assumed, and the city would need to have some enforcement mechanism in place to ensure thearker or the parker’s employer withholds the city income tax from the employee’s salary, or reports the benefit as income on the employee’s income tax return. Costs associated with this tax would be distributed among the agencies and personnel that are already responsible for collecting, assessing, and enforcing income tax in New York City and New York State government.

\textsuperscript{36} Schaller (2006a), page 45, cites Census Journey to Work data that indicate 270,000 people drive to work in the CBD each day. At an average vehicle occupancy of 1.4, this translates to 194,000 vehicle trips ending the CBD each day for commute purposes.

\textsuperscript{37} Schaller (2007), page 9. The actual percentage of motorists affected by the tax could be considerably less because motorists in this category include both regular commuters who are provided a parking space by their employer (and would be affected by the tax) and motorists on infrequent business-related trip who are eligible to be reimbursed for their parking fees (and would not be affected by the tax).

\textsuperscript{38} The elasticity may be less than the -0.3. If drivers are not given price signals each time they park, but instead are presented with a relatively insignificant increase in their gross pay, viewed on their regular paycheck stub or on their income tax form once per year, they are not as likely to be affected by the increase.
Table 4.2  Estimated Effect of Taxation of Parking Benefits on Daily Vehicle Miles Traveled in the CBD

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of vehicles that park each day in Manhattan CBD (commute trips only)</td>
<td>194,000</td>
</tr>
<tr>
<td>Percentage who park off-street in employer-provided parking</td>
<td>24%</td>
</tr>
<tr>
<td>Number who park off-street in employer-provided parking</td>
<td>46,500</td>
</tr>
<tr>
<td>Number who park off-street in employer-provided parking, and pay city income tax (50%)</td>
<td>23,300</td>
</tr>
<tr>
<td>Percentage increase in monthly parking cost</td>
<td>3.648%</td>
</tr>
<tr>
<td>Elasticity of demand for parking with respect to price</td>
<td>-0.3</td>
</tr>
<tr>
<td>Percentage decrease in parking ([\text{EXP}(\text{elasticity} \times \ln(\text{percentage increase in cost}))]-1)</td>
<td>-1.1%</td>
</tr>
<tr>
<td>Motorists who no longer park off-street</td>
<td>250</td>
</tr>
<tr>
<td>Motorists who continue to drive into the CBD but park elsewhere (20%)</td>
<td>50</td>
</tr>
<tr>
<td>Motorists who no longer drive into the CBD (80%)</td>
<td>200</td>
</tr>
<tr>
<td>Average daily VMT per trip for trips ending in CBD (portion of trip in CBD only)</td>
<td>2.19</td>
</tr>
<tr>
<td>Estimated daily VMT reduction due to taxation of parking benefits</td>
<td>450</td>
</tr>
<tr>
<td>Percentage reduction in daily VMT</td>
<td>0.016%</td>
</tr>
</tbody>
</table>

Note: These calculations assume only commuters would be affected by taxation of parking benefits. Therefore, a baseline of 194,000 commuter vehicles is used rather than the 274,000 total passenger vehicles entering the CBD on a typical day.

4.4 PARKING CASH-OUT

Parking cash-out has been popular with businesses and employees in the limited number of cases where it has been implemented, but especially in New York City’s CBD, each business must do a careful analysis of whether cash-out is a wise financial decision. Businesses must weigh the capital savings on parking (based on the cost of a parking space and the expected reduction in demand for parking) against the annual cost per square foot for the cash-out payments (including any additional tax liability they would incur due to an increase in their employees’ gross incomes), and then compare annual cost for the cash-out payments as a percentage of capital savings against the cost of capital.

Assuming parking demand exceeds supply at the current price point in the CBD, parking cash-out can be an even more effective strategy for reducing demand for parking in the CBD if it is accompanied by a reduction in available parking spaces, such as a shift in allocation from solo drivers to carpools.

Various states and municipalities have taken different approaches to implementing parking cash-out. In California, a state law was passed that requires companies to offer parking cash out. Other states and cities have asked businesses to implement parking cash-out voluntarily. Most of the state’s costs
have been associated with producing and disseminating educational materials about parking cash-out, since the concept is not widely understood.

To estimate the potential VMT reduction that could be realized by encouraging additional employers to offer parking cash-out voluntarily (for example, by offering tax incentives to offset the additional Federal tax liability they would incur due to an increase in their employees’ gross incomes), the following could be assumed:

- An estimated 194,000 personal vehicles park in the CBD as part of a daily commute each day.\(^{39}\)
- Taking into account employers who already offer parking cash-out, employers representing an additional 10 percent of CBD employers would voluntarily offer parking cash-out;
- 10 percent of employees would accept a parking cash-out offer.\(^{40}\) Some types of workers, such as construction workers who have free on-site parking, would be unlikely to participate.

Table 4.3 shows the calculation of VMT reduction that could be achieved by instituting voluntary parking cash-out.

\(^{39}\) Schaller (2006a), page 45, cites Census Journey to Work data that indicate 270,000 people drive to work in the CBD each day. At an average vehicle occupancy of 1.4, this translates to 194,000 vehicle trips ending the CBD each day for commute purposes.

\(^{40}\) Shoup (1997) found that in California, parking cash-out offers reduced vehicle trips by 11 percent on average, and Schaller (2006a) found that 90 percent of auto commuters to New York’s CBD have a transit option for their commute trip.
Table 4.3  **Estimated Effect of Voluntary Parking Cash-Out on Daily Vehicle Miles Traveled in the CBD**

<table>
<thead>
<tr>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of vehicles that park each day in Manhattan CBD (commute trips only)</td>
<td>194,000</td>
</tr>
<tr>
<td>Percentage who park off-street in employer-provided parking</td>
<td>24%</td>
</tr>
<tr>
<td>Number who park off-street in employer-provided parking</td>
<td>46,660</td>
</tr>
<tr>
<td>Number working at a firm that begins to offer parking cash-out for the first time (10%)</td>
<td>4,660</td>
</tr>
<tr>
<td>Number of drivers accepting parking cash-out offer (10%)</td>
<td>465</td>
</tr>
<tr>
<td>Average daily VMT per trip for trips ending in CBD (portion of trip in CBD only)</td>
<td>2.19</td>
</tr>
<tr>
<td>Estimated daily VMT reduction due to taxation of parking benefits</td>
<td>1,020</td>
</tr>
<tr>
<td>Percentage reduction in daily VMT</td>
<td>~0.02%</td>
</tr>
</tbody>
</table>

Note: These calculations assume only commuters would be eligible for parking cash-out. Therefore, a baseline of 194,000 commuter vehicles is used rather than the 274,000 total passenger vehicles entering the CBD on a typical day.

According to these calculations and assumptions, parking cash-out could reduce VMT by 1,020 miles per day, a 0.02 percent reduction. The VMT reduction is calculated only for the portion of the trips inside the CBD. VMT for the remainder of these trips outside the CBD also would be reduced. In a voluntary program, if tax incentives are offered by the city, the City’s share of the cost of the tax incentives and any employer education programs would need to be taken into account.

Subsidized, off-street parkers, who make up less than a third of all parkers in the CBD, would be the biggest beneficiaries of a parking cash-out program. It is difficult to estimate what percentage of businesses would offer parking cash out (especially if the program is voluntary) and what percentage of employees would take the offer. Some types of workers, such as construction workers who have free on-site parking, would be unlikely to participate. All things considered, parking cash out is unlikely to have a significant effect on VMT in the CBD by itself.

### 4.5 **INCREASE RATES FOR ON-STREET METERED PARKING**

Donald Shoup, in his book *The High Cost of Free Parking*, advocates for increasing the price of all on-street parking to market rates, including parking that is currently unmetered and parking that is metered. He defines market rates as the price that will result in a 15 percent vacancy rate, or approximately two to three
spaces per crosstown block (long blocks on numbered Streets between Avenues, where most unmetered parking is found) in New York City’s CBD.41

In order to achieve these vacancy rates, the city would have to experiment with prices to determine the right price on each block or in each neighborhood, as both San Francisco and Redwood City have done. Fortunately, Muni-Meters could facilitate the experiment, enabling variable pricing by time of day, by location, and by type of vehicle (as is already done in the Theater District and on some Midtown streets and a portion of Canal Street for commercial vehicles).

New York City already has experimented with market-rate pricing using Muni-Meters. On east and westbound streets from 23rd Street to 59th Streets from Second to Ninth Avenues, and on Canal Street between Bowery and West Broadway, free loading zones were eliminated as part of the city’s Commercial Parking/Congestion Pricing Program. Commercial vehicles must now pay $2 for one hour, $5 for two hours, and $9 for three hours of parking for loading and unloading in these areas. At most of the spaces the rates are in effect from 7 a.m. to 6 p.m. Monday through Friday.

The Commercial Parking/Congestion Pricing program has provided the city with real-world experience in setting prices for parking to encourage turnover and make efficient use of curb space. Figure 4.1 shows an example of signage and a Muni-Meter display on a block where commercial vehicle pricing has been implemented.

41Shoup claims that “Traffic engineers usually recommend that at least one in seven curb spaces—one space in every seven—should remain vacant at all times to ensure easy parking access and egress,” and cites three traffic engineering books and studies on the impacts that cars searching for parking have on traffic flow and time spent searching for parking. [Shoup (2005) page 297.]
If discouraging retail customers is a concern with raising meter rates, the City could implement graduated rates, similar to those used in the existing Commercial Parking/Congestion Pricing Program for commercial vehicles. Lower rates for the first hour or two, following by steeply increasing rates for subsequent hours, could allow people to pay reasonable prices for short-term parking while encouraging turnover of spaces.

It is likely that increasing the metered rates in the CBD will push more parkers to unmetered blocks, which are primarily on residential streets. This could be prevented through a new system of residential parking permits, which would limit alternate side spaces to neighborhood residents.

The imposition of higher rates for on-street parking in the CBD would affect VMT in two ways:

- First, VMT would be reduced among those drivers who are no longer circling the block in the CBD in search of parking. One of the key benefits of metered parking is the potential to reduce cruising for parking in the CBD. As mentioned previously, studies have found that a significant share of traffic on

42 The permits themselves could be priced at market rates to ensure supply meets demand. In several cities, permits are issued at zero or minimal cost to all who are eligible. Other cities, such as Toronto, have experimented with relatively high residential parking permit fees and/or have limited the number of permits to the number of available spaces.
CBD streets at various times of day is made up of motorists looking for a free parking space.

- Second, VMT would be reduced among motorists who are discouraged from driving to the CBD.

In a 2006 survey of drivers on Prince Street in SoHo, 28 percent of drivers said they were searching for parking.\(^{43}\) Another study completed in 2007 found that 45 percent of drivers on Seventh Avenue in Park Slope, Brooklyn, were searching for a parking space.\(^{44}\) Studies elsewhere around the world found that between 8 and 74 percent of the traffic was due to cruising for parking.\(^{45}\)

To calculate the potential VMT reduction due to reduction in cruising, the following assumptions could be made:

- During a typical weekday in 2005, nearly 800,000 autos, taxis, trucks, and vans were estimated to have driven into Manhattan below 59th Street.\(^{46}\) Personal vehicles made up 67 percent of this number, which is equal to 536,000 auto trips into the CBD. Pass-through trips made up 35 percent of this total, and four percent of vehicles entering the CBD made one or more stops but did not park, leaving 61 percent, or an estimated 330,000 vehicle trips ending in the CBD.\(^{47,48}\)

- Of these 330,000 personal vehicles, approximately 16,500 (or 5 percent) park at a meter on the street.\(^{49}\) Vehicles parking at metered spaces include some with placards. The exact proportion is not known, but for purposes of this estimate, it is assumed that 17 percent of vehicles parking at on-street meters, or 2,800, have placards, leaving about 13,700 vehicles parking at meters without placards.

- If it is assumed that each vehicle without a placard spends about 9 minutes\(^{50}\) searching for on-street parking in the CBD, at an average speed of 6.5 miles

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\(^{43}\)Schaller (2006b).  
\(^{44}\)Transportation Alternatives (2007).  
\(^{45}\)Shoup (2006), page 1.  
\(^{46}\)New York Metropolitan Transportation Council (2007).  
\(^{47}\)Schaller (2007), page 14.  
\(^{48}\)Schaller (2006a), page 2.  
\(^{49}\)Schaller (2007), page 9.  
\(^{50}\)Shoup (2005), page 290. Three 1993 studies of cruising for parking in New York were cited by Shoup, along with various other examples from around the world. The midpoint of the search times for the New York studies was about 9 minutes.
per hour, each vehicle generates 0.975 VMT per trip searching for parking. A vehicle may make more than one trip and search for parking more than once per day in the CBD, but for purposes of this calculation, each vehicle entering the CBD is assumed to search for parking on the street only once per day.

- Placard vehicles have to search for parking, but their search time is assumed to be 6 minutes today, rather than 9 minutes, because they are able to park in metered spaces at no cost as well as certain spaces signed “No Parking” for general motorists. With an average speed of 6.5 miles per hour, each placard vehicle generates about 0.65 VMT per trip. Assuming the on-street meters would be priced high enough to guarantee a 15 percent occupancy rate, both placard parkers and other on-street parkers would benefit from the reduced search time. (The implications of on-street parking availability on placard parkers’ decisions to drive into the CBD are discussed below.)

Table 4.4 shows the calculation of reduction in VMT due to reduced cruising for parking. VMT among placard parkers could be reduced by 300 miles per day, while all other parkers would reduce VMT by about 7,400 miles per day, for a total VMT reduction of 7,700 miles per day just due to a reduction in cruising (an overall reduction of 0.27 percent).

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51 This assumption is based on average travel speeds in Manhattan and considering that while searching for parking, motorists often travel at much slower speeds than overall traffic.
Table 4.4  Estimated Effect of Increasing On-Street Meter Rates on Daily Vehicle Miles Traveled in the CBD

<table>
<thead>
<tr>
<th></th>
<th>Placard</th>
<th>No Placard</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Number of commuters who park in metered spaces on the street each day in the CBD before price increase (trips)</td>
<td>2,800</td>
<td>13,700</td>
</tr>
<tr>
<td>B</td>
<td>Search time for on-street space before price increase (minutes)</td>
<td>6</td>
<td>9</td>
</tr>
<tr>
<td>C</td>
<td>Average speed while searching for space (MPH)</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>D</td>
<td>VMT generated by cruising, per vehicle ([B/60] * C)</td>
<td>0.650</td>
<td>0.975</td>
</tr>
<tr>
<td>E</td>
<td>VMT generated by cruising before price increase (A*D)</td>
<td>1,800</td>
<td>13,400</td>
</tr>
<tr>
<td>F</td>
<td>Average daily VMT per trip for trips ending in CBD (portion of trip in CBD only)</td>
<td>2.19</td>
<td>2.19</td>
</tr>
<tr>
<td>G</td>
<td>VMT generated by trips ending in the CBD before price increase (A*F)</td>
<td>6,100</td>
<td>30,000</td>
</tr>
<tr>
<td>H</td>
<td>Total VMT attributable to trips entering the CBD to park on-street before price increase (E+G)</td>
<td>8,000</td>
<td>43,300</td>
</tr>
<tr>
<td>J</td>
<td>Percentage increase in parking cost</td>
<td>0</td>
<td>167%</td>
</tr>
<tr>
<td>K</td>
<td>Elasticity of demand for parking with respect to price</td>
<td>0.0</td>
<td>-0.3</td>
</tr>
<tr>
<td>L</td>
<td>Percentage decrease in parking (EXP[K*ln(J+1)])-1)</td>
<td>0%</td>
<td>-25.5%</td>
</tr>
<tr>
<td>M</td>
<td>Motorists who no longer park at a meter (A*L)</td>
<td>0</td>
<td>3,500</td>
</tr>
<tr>
<td>N</td>
<td>Motorists who continue to drive into the CBD but park elsewhere (20%)</td>
<td>0</td>
<td>700</td>
</tr>
<tr>
<td>P</td>
<td>Motorists who no longer drive into the CBD (80%)</td>
<td>0</td>
<td>2,800</td>
</tr>
<tr>
<td>Q</td>
<td>Number of commuters who park on the street each day in the CBD after price increase (A-P)</td>
<td>2,800</td>
<td>10,900</td>
</tr>
<tr>
<td>R</td>
<td>Search time after implementation of higher-rate on-street parking (minutes)</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>S</td>
<td>Average speed while searching for space (MPH)</td>
<td>6.5</td>
<td>6.5</td>
</tr>
<tr>
<td>T</td>
<td>VMT generated by cruising, per vehicle ([R/60]*S)</td>
<td>0.54</td>
<td>0.54</td>
</tr>
<tr>
<td>U</td>
<td>VMT generated by cruising after price increase (Q*T)</td>
<td>1,500</td>
<td>5,900</td>
</tr>
<tr>
<td>V</td>
<td>Reduction in VMT due to reduction in cruising (E-U)</td>
<td>300</td>
<td>7,400</td>
</tr>
<tr>
<td>W</td>
<td>Percent change in VMT due to reduction in cruising</td>
<td>0.01%</td>
<td>0.26%</td>
</tr>
<tr>
<td>X</td>
<td>Average daily VMT per trip for trips ending in CBD (portion of trip in CBD only)</td>
<td>2.19</td>
<td>2.19</td>
</tr>
<tr>
<td>Y</td>
<td>VMT generated by trips ending in the CBD after price increase (Q*X)</td>
<td>6,100</td>
<td>23,900</td>
</tr>
<tr>
<td>Z</td>
<td>Reduction in VMT due to reduction in vehicle trips to the CBD (G-Y)</td>
<td>0</td>
<td>6,100</td>
</tr>
<tr>
<td>AA</td>
<td>Percent change in VMT due to reduction in vehicle trips to the CBD</td>
<td>0.0%</td>
<td>0.21%</td>
</tr>
<tr>
<td>BB</td>
<td>Total VMT attributable to on-street parking after price increase (U+Y)</td>
<td>7,700</td>
<td>29,800</td>
</tr>
<tr>
<td>CC</td>
<td>Total reduction in VMT due to implementation of higher-rate on-street parking (V+Z)</td>
<td>300</td>
<td>13,500</td>
</tr>
<tr>
<td>DD</td>
<td>Percent change in VMT</td>
<td>0.01%</td>
<td>0.47%</td>
</tr>
</tbody>
</table>

Note: Due to rounding, some figures may not total correctly.

To estimate the reduction in VMT due to drivers who are discouraged from driving into the CBD, the following could be assumed:

- As stated above, approximately 2,800 vehicles with placards park at meters and about 13,700 vehicles park at meters without placards.


- There are 29,000 curb spaces in the CBD, of which 6,900 have meters.\textsuperscript{52} As the average motorist parks on-street for 3.6 hours,\textsuperscript{53} it is clear that a typical metered space turns over multiple times throughout the day, accounting for the discrepancy between the number of meters and the number of vehicles parked at all meters in a given day.

- If, for purposes of this example, the hourly rate at an on-street meter were to be increased 167 percent, from $1.50 per hour to $4 per hour, rates would be closer to the average hourly rate paid by motorists who park in an off-street garage for the average occupancy of 6 hours per day.\textsuperscript{54}

- Using the results from the San Francisco study, the elasticity of demand for parking at a metered space with respect to price is assumed to be -0.3, implying a 0.3 percent decrease in parking demand for each 1 percent increase in price.

- Motorists would have the alternative of parking in an unmetered space, but it is assumed that if an unmetered space were available in the neighborhood where the motorist was parking, the motorist would choose to park for free. As was assumed in the example above with an increase in the price of off-street parking, perhaps 20 percent of motorists priced out of metered spaces would switch to an unmetered space further from their destination or to a garage (which would be a comparable value after the meter rate increase, considering security, climate control, and other benefits of off-street parking), rather than switch to other modes or cancel their trips.

Table 4.4 shows the calculation of VMT reduction for vehicles entering the CBD, if the price of on-street parking meters in the CBD were to be increased to higher rates. The total VMT reduction could be 6,100, a 0.21 percent decrease. Vehicles with placards would not be affected, because they do not pay for on-street parking. The VMT reduction is calculated only for the portion of the trips inside the CBD. VMT for the remainder of the trips outside the CBD also would be reduced.

Accounting for trips within the CBD associated with cruising for parking plus trips to the CBD, increasing the price of all on-street parking in the CBD to higher rates could decrease VMT by a nearly 14,000 miles, about one half percent. The excess capacity could be absorbed by through traffic or delivery vehicles within the CBD, so these estimates may be high. The impacts would vary by neighborhood, since motorists with placards compete for metered spaces with non-placard parkers, commercial vehicles, and others to a different degree in, say, SoHo, than in the area around City Hall and other government offices.

\textsuperscript{52} Schaller (2007), page 6.
\textsuperscript{53} Ibid, page 11.
\textsuperscript{54} Ibid, page 11.
The costs of installing and maintaining new meters (which could be Muni-Meters) and new signage.

4.6 REDUCING PLACARD PARKING

According to a 2005 study, two out of the top 10 Census tracts in Manhattan where people drive to work surround the government offices and courts in Lower Manhattan. As mentioned in Section 2, 33 percent of government workers in Manhattan’s CBD drive to work, and they are more than twice as likely to drive than private sector finance, real estate, and professional service workers. Reducing the rate of driving among government workers could be based on prioritization of placard issuance, similar in concept if not in details to the strategy employed by the Federal government in Washington, D.C.

VMT impacts will be estimated separately for this alternative using the BPM.

Monitoring and enforcing the use and misuse of placards could be an effective way to reduce trips by drivers with placards, but the city would bear the costs of tracking the placards and increased enforcement of their proper use.

4.7 ESTIMATED IMPACT ON VMT IN THE NEW YORK CITY CBD

In terms of reduction in vehicle-miles-traveled (VMT), strategies to increase the price of parking in the CBD would have a range of impacts, and some may even increase VMT. Initiatives that discourage parking in New York’s CBD would impact vehicle trips ending in the CBD, but VMT associated with through traffic would be unaffected. It is even possible that some of the excess capacity freed up by trips that formerly were destined for the CBD could be absorbed by new through traffic.

Table 4.5 summarizes the potential VMT impacts of each strategy discussed in this section.

Charging higher rates for parking at on-street meters would be among the most successful parking-related policies in terms of VMT reduction. Increased on-street parking rates could reduce VMT associated with cruising for parking spaces, and it also would reduce the supply of long-term parking on streets in the CBD, thus reducing the VMT among commuters and other all-day parkers. This policy has the potential to reduce VMT by about 14,000 miles per day, about one half percent less than current levels.
### Table 4.5 Impacts of Potential Parking Initiatives on VMT in the CBD

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Reduction in daily VMT in the CBD</th>
<th>Percent reduction in total VMT in the CBD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parking freeze</td>
<td>No reduction in current VMT; potential reduction in future VMT growth</td>
<td>0%</td>
</tr>
<tr>
<td>Elimination of Manhattan resident parking tax discount</td>
<td>To be estimated using Best Practice Model</td>
<td></td>
</tr>
<tr>
<td>Taxing off-street subsidized parking as income</td>
<td>450 VMT</td>
<td>0.016%</td>
</tr>
<tr>
<td>Parking cash-out</td>
<td>1,020 VMT</td>
<td>~0.02%</td>
</tr>
<tr>
<td>Increasing rates at on-street parking meters</td>
<td>14,000 VMT</td>
<td>0.5%</td>
</tr>
<tr>
<td>Reducing placarded parking</td>
<td>To be estimated using Best Practice Model</td>
<td></td>
</tr>
</tbody>
</table>

Note: Does not include VMT reduction outside the CBD, and does not account for latent demand for driving in the CBD (e.g., by delivery vehicles and through traffic) that could offset the VMT reductions.

A parking cash-out program is unlikely to have a significant effect on VMT in the CBD on its own (approximately 1,020 VMT per day), but, assuming there is a shortage of parking in the CBD, parking cash-out can be a more effective strategy for reducing demand for parking in the CBD if it is accompanied by a reduction in available parking spaces, such as a shift in allocation from solo drivers to carpools. If there is no shortage, and parking can be priced to match demand, there is no need to eliminate capacity.

Taxing off-street subsidized parking as income would have little or no impact on commuter mode choice due to the very small percentage increase and real increase in the cost of commuting. The reduction may be fewer than 500 VMT per day.

A parking freeze would have no impact on current VMT, but it could help to reduce future growth in VMT. New York City’s already-stringent regulations governing accessory parking in new developments, coupled with the high cost of land, may already be reducing the number of off-street parking spaces in the CBD.
5.0 Key Findings and Conclusions

There is no one solution to the problem of congestion in and around in New York City’s CBD. The demand for parking is divided among several types of motorists, each of which has different characteristics and will have different reactions to potential policy changes. A combination of measures would achieve the greatest impacts. However, due to the extremely high demand for travel to and through the CBD, it is possible that the congestion reduction benefits of a particular parking strategy could be partially or completely offset by latent demand for through trips and other types of trips that use CBD streets (and the roadways leading to the CBD) but do not park. Estimates of VMT reduction cited in this report account for parking-related VMT only and do not consider latent demand.

The following are the major conclusions of this analysis:

- In terms of reduction in vehicle-miles-traveled (VMT), charging higher rates for metered parking could be among the most effective parking-related strategies analyzed in this paper. “Higher rates” implies a rate structure that would encourage regular turnover of spaces such that at any given time, about 15 percent of spaces are free (approximately 3 spaces per crosstown block if all spaces on the block are metered, or fewer if there is a mix of metered and unmetered spaces). The vacancy rate cuts down on traffic circling the block in search of parking and encourages turnover of parking spaces so that they can be used by short-term visitors rather than all-day workers. Because it reduces parking search as well as overall trips into the CBD, this strategy has the double benefit of reducing VMT and traffic congestion. To be most effective, it could be implemented in conjunction with a residential parking permit system to prevent spillover from metered to unmetered streets.

- Accounting for reduction in traffic circling the block and a reduction in trips entering and leaving the CBD, implementation of increased on-street parking rates could reduce VMT by about 14,000 miles per day, about one half percent reduction from current levels.

- Other strategies to increase the price of parking in the CBD would have only a modest impact, and some may even increase VMT. An elimination of the Manhattan resident parking tax discount may reduce VMT; however, if parking garage operators simply absorb the added cost to drivers and keep garage prices constant, there would be no effect on drivers and no change in VMT. An elimination of the parking tax discount may be the easiest strategy to implement, given that the infrastructure and regulatory framework for a parking tax is already in place, but there is a possibility that the change in tax policy could simply reduce operator revenues with no reduction in VMT.
• An estimated 42 percent of motorists who park in the CBD pay the full cost of off-street parking out of their own pocket. Some of these motorists can deduct the cost of parking as a business expense, but still pay a substantial share of the cost out of pocket even when the tax break is considered. However, an increase in the parking tax might also be the least equitable solution because motorists who currently are paying for parking would be forced to pay more (unless parking lot operators simply absorb the tax), while the “free” parkers would continue to be subsidized. An increased parking tax may even persuade some drivers to join the ranks of “free” parkers, increasing VMT as they cruise in search of an open unmetered space where they can park for the day.

• An alternative may be to devise a method of influencing employers who provide free parking rather than taxing the individual consumers, but it is not clear if the VMT implications would be any different. About 34 percent of motorists receive free off-street parking from their employer, are reimbursed for the cost of parking by their employer or others, or have one of 20 categories of government-issued placards or permits that enables them to park for free in designated off-street spaces throughout the CBD. Motorists who have a guaranteed, reserved parking space at no cost are the most difficult to dissuade from driving into the CBD. New York City could attempt to implement a variety of measures to accomplish this goal, including taxing company-owned parking spaces directly, taxing parking benefits as income (which would have little or no impact on VMT or mode choice), encouraging or requiring employers to give their employees the cash equivalent for their parking benefit (which would produce a VMT reduction of approximately 1,020 miles per day), or restricting distribution and use of off-street parking placards.

• Initiatives that discourage parking in New York’s CBD would impact vehicle trips ending in the CBD. Through traffic would be unaffected, however. It is even possible that some of the excess capacity freed up by trips that formerly were destined for the CBD could be absorbed by new through traffic. Given that through auto traffic as a percentage of total auto traffic at Hudson River Tunnels and East River Crossings ranges from 30 to 60 percent,55 the City may wish to study potential impacts on through traffic before parking policies are implemented in New York.

• Options for further restricting already scarce and expensive parking in Central London were considered insufficient to reduce congestion to targeted levels given that through traffic was approximately 30 to 40 percent of all traffic in Central London before congestion pricing was implemented there.56

55Schaller (2006a), pages 36 and 37.
6.0 References and Sources of Additional Information


New York Metropolitan Transportation Council (NYMTC) and the North Jersey Transportation Planning Authority (NJTPA) (2000). Regional Travel Household Interview Survey.


Consulting.


