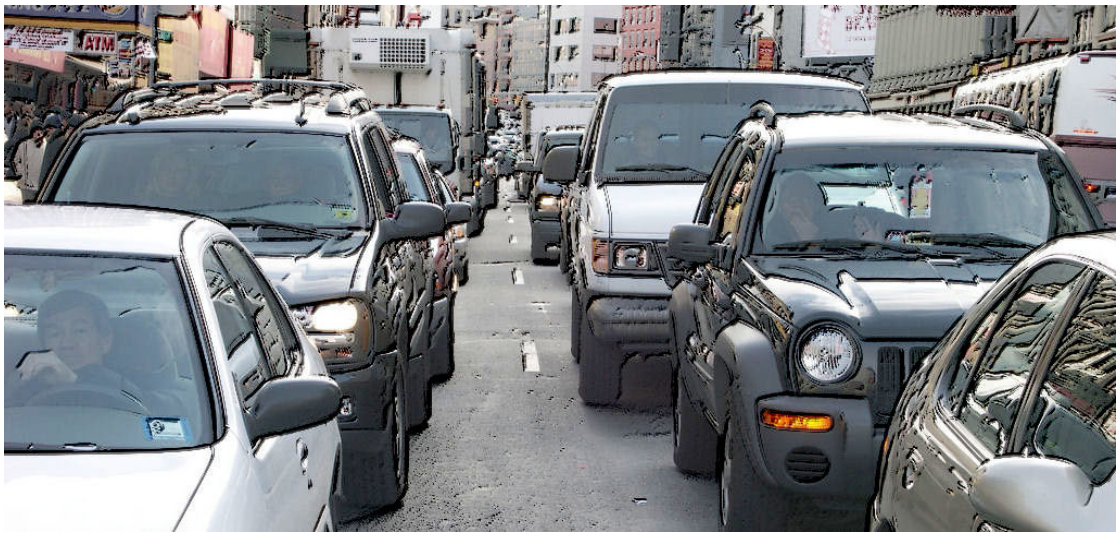

Necessity or Choice?

Why People Drive in Manhattan

Prepared for
Transportation Alternatives

February 2006

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Summary

The Manhattan Central Business District (CBD), defined as the area from 59th Street to the Battery, is the largest and densest CBD in the United States. It is far better served by public transportation than any other location in the country. Yet every day, 830,000 vehicles – mostly personal autos – enter the CBD. They foul the air, slow traffic and obstruct pedestrians, bicyclists and buses, transport modes that make far more efficient use of the public right of way.

Even with $51 billion in improvements to public transportation over the last two decades, auto use in the city is stable or growing:

- The total number of vehicles accumulating in the CBD increased by 13,500 in 2004, the largest increase since at least 1980 (aside from the rebound after post-9/11 auto restrictions were lifted).
- Auto ownership in New York City increased in 2005 for the first time since 2000.
- The proportion of New Yorkers who commute by auto was unchanged between 2000 and 2004. With New York City employment now expanding, auto commuting is also most likely on the rise.

Reducing auto usage in Manhattan would improve the performance of the transportation system by making more efficient use of the city's street space. Reducing auto use would enhance the quality of life for workers, visitors and residents, as shown by the successful implementation of congestion charging in central London. But while New York City officials have increasingly recognized the advantages of favoring more efficient, quieter and cleaner forms of transportation, proposals for sidewalk widening, bicycle lanes, exclusive bus lanes and parking reform – not to mention bridge tolls and congestion pricing – have either been implemented slowly or not at all.

Slow progress stems from concern about how motorists and the city as a whole would be affected by steps that may affect auto use. Addressing these concerns requires understanding:

- Why people use their personal automobile in the Manhattan CBD,
- Whether they have viable alternatives, and
- How motorists would respond if less street space were devoted to auto use or if the costs associated with CBD driving were increased.

This report addresses each of these key questions.

Key Findings

1) ***The personal auto accounts for most of the traffic circulating in the Manhattan CBD – more than trucks, buses, commercial vehicles and taxis combined.***

   Personal autos comprise an estimated 60% of vehicle trips with CBD destinations while 40% are trucks, buses, commercial vehicles or taxis.

2) ***Autos represent the least productive use of scarce public space.***

   Cars use ten times as much space per person mile of travel as compared with buses and two and one-half times the space used by pedestrians. Cars also pollute the air, cause injuries from motor vehicle crashes and impede the movement of other, more efficient, transport modes.

3) ***For most people making CBD trips, the personal auto is more of a hindrance than a help to getting around.***

   Only 14% of trips to Central Business District (CBD) destinations are taken by car, compared with 72% by foot, bus or both. Thus, five times more people would benefit by having more space for walking and buses than would be affected by reducing the space allocated to autos.

4) ***For most commuters who work in the Manhattan CBD, driving is a matter of choice, not necessity.***

   Ninety percent of auto commuters live and work in areas where most commuters use some other mode to get to work (i.e., rail, bus, walk, taxi). Only 10% of CBD auto commuters commute between home and work areas in which auto is the typical way to make the trip.

   The choice of auto is motivated by the comfort and convenience of driving, speed of travel, availability of free parking or a combination of these and other factors. Very few people who drive in the Manhattan CBD lack an alternative mode.

5) ***Traffic congestion at the bridges, tunnels and avenues leading into the CBD is exacerbated by the large number of motorists who drive into and then out of the CBD to reach non-CBD destinations.***

   39% of drivers using East River bridges are destined to upper Manhattan, the Bronx or outside New York City. Over 30% of drivers using the Holland and Lincoln Tunnels have destinations outside the CBD.

Conclusions

1) ***Reallocating street space from cars to pedestrians, bicyclists, buses and trucks would improve the mobility of persons and goods in Manhattan. Improving mobility would in turn bolster Manhattan's economic engine.***

   Putting public space in the CBD to anything less than the most efficient use unnecessarily slows the movement of people and goods in this dense district, thus wasting time and sapping the economic efficiency of CBD workers. Since the personal auto is the least efficient user of street space, and since auto users have alternatives, the amount of space allocated to the personal auto should be rebalanced in favor of more productive uses for pedestrians, bicyclists, buses, taxis, trucks and commercial vehicles that can more efficiently contribute to the mobility of persons and goods in Manhattan. Doing so would increase the quality and comfort of travel in the CBD and the CBD's attractiveness as a place to work, shop, visit and live.

   London's experience with congestion pricing is concrete evidence that with reductions in auto use, very few people stop coming to the CBD. London's experience also demonstrates the substantial benefits for quality of life and ease of moving around the CBD.

2) ***Steps to reduce auto use should include improvements to alternative modes.***

   Steps to reduce auto use should be accompanied by steps to improve the speed, comfort and availability of alternative modes. Innovations such as bus rapid transit can help to maximize mobility into, out of and within the Manhattan CBD. London's experience illustrates that substantially reducing auto use in the CBD requires expansion of transit services.

3) ***Addressing auto use into Manhattan requires addressing the lack of viable alternative routes and limited alternative modes for through drivers.***

   Through traffic is clearly a problem: one-third or more of drivers who enter the CBD are bound for non-CBD destinations. Providing better transit options for through drivers -- such as between the Meadowlands/Secaucus area and both eastern Queens and southern Brooklyn -- would be a step toward addressing the problem of through traffic.

Table of Contents

Introduction

Space is at a premium in New York. Nowhere is this fact more evident than on the streets and sidewalks of Manhattan's Central Business District (CBD), defined as the area from 59th Street to the Battery. The largest and densest CBD in the U.S. is home to 560,000 residents and a daytime population that includes over 1.7 million workers. Because of the crush of cars, trucks, vans and taxis, traffic inches along at 6 mph on crosstown streets and 8 mph on avenues in Midtown Manhattan.[1] Sidewalks are often even more crowded than the streets, and pedestrians and vehicles jockey for space at the crosswalks.

In the 1930s, Stalin used prison labor to widen Moscow's equivalent of 5th Avenue by literally moving the buildings that lined the avenue. Short of such drastic action, New York City must make the most efficient use of the existing right of way. Putting public space in the CBD to anything less than the most efficient use unnecessarily slows the movement of people and goods in this dense district, thus wasting time, degrading the quality of life and weakening the economic efficiency of CBD workers.

Cars make the least efficient use of the public right of way. Cars use ten times as much space per person mile of travel as compared with buses and two and one-half times the space used by pedestrians.[2] Cars also pollute the air, cause injuries from motor vehicle crashes and impede the movement of higher-efficiency transport modes.

The benefits of reduced auto use are clear: less traffic congestion, improved air quality, improved mobility for bus riders, pedestrians, commercial vehicles and taxis; less noise; and fewer motor vehicle crashes.

Yet, auto use is not abating in New York, even after $51 billion in spending on improvements to the region's subway, bus and rail system since the early 1980s.[3] Quite the opposite: the latest data show that auto use is stable or growing in the city:

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[1] Source: Mayor's Management Report, Fiscal Year 2000. Traffic speeds are no longer reported in the Mayor's Management Report, but current speeds are likely to be similar to traffic speeds prior to 9/11.

[2] Based on figures in Boris S. Pushkarev and Jeffrey M. Zupan, Urban Space for Pedestrians. Cambridge: MIT Press, 1975.

[3] The $51 billion figure is from Mark Seaman, Allison L. C. de Cerreño, and Seth English-Young, "From Rescue to Renaissance: The Achievements of the MTA Capital Program 1982 – 2004," New York University Rudin Center for Transportation Policy & Management, Dec. 2004, page i.

- The total number of vehicles accumulating in the CBD increased by 13,500 in 2004 – the largest increase on record (data go back to 1980) except for the rebound after post-9/11 auto restrictions were lifted.[4] Peak vehicle accumulation in the fall of 2004 was at the highest level since the fall of 1999.
- Auto ownership in New York City increased in 2005 for the first time since 2000.[5] In 2005 there were 1,672,758 registered autos in New York City.
- The proportion of New Yorkers who commute by auto was unchanged between 2000 and 2004.[6] With renewed growth in New York City employment, auto commuting is also likely to be on the rise.

In recent years, City officials have increasingly recognized the advantages of allocating space previously used for autos to other more efficient uses. The City has added bus and bicycle lanes on major avenues and streets, established bus-only crosstown streets, widened sidewalks (most notably in Times Square and Herald Square) and closed streets to traffic altogether (e.g., Wall Street, and Nassau and Fulton streets during the midday).

These changes benefit most CBD travelers since the personal auto ranks low in importance for the large majority of residents, workers and visitors to the CBD. Only 14% of trips to Central Business District (CBD) destinations are taken by car, compared with 72% by foot, by bus, or both.[7] Thus, five times more people would benefit by having more space for walking and buses than would be affected by reducing the space allocated to autos.

Although the personal auto is a relatively inefficient way to move people in the CBD and most people rarely drive in the CBD, especially on weekdays, steps that would impinge on auto use are not easily adopted. Proposals for sidewalk widening, bicycle lanes, exclusive bus lanes, bridge tolls and congestion pricing have either been implemented slowly or not at all.

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[4] Source: CBD screenline traffic counts provided by New York City Department of Transportation.

[5] Source: New York State Department of Motor Vehicle registrations in force.

[6] Source: U.S. Census Bureau, American Community Survey. The ACS is the replacement for the decennial U.S. Census Long Form data that includes detailed journey to work data. ACS data is currently available at the city and borough level based on place of residence but not place of work. 2000 Census data are used later in the report for analysis at the sub-borough level, and for analysis of home-to-workplace commuting patterns.

[7] These figures are based on the "main mode" for trips involving more than one mode. Source: New York Metropolitan Transportation Council and North Jersey Transportation Planning Authority, 1997/98 Household Interview Survey, author's analysis for CBD trips. The survey sample has 7,097 trips to CBD destinations, including 885 auto trips. Note that taxi/livery trips appear to be underrepresented in the sample, which is typical for this type of survey.

This resistance stems from concern about the consequences of restrictions for auto users and the city as a whole. Do auto users have realistic transit options? How would they get to work, shopping or the theatre without their car? Would retail sales drop if auto use were restricted? If streets are narrowed or reserved for buses or bicyclists, will overall traffic speeds decline from their already abysmal levels?

This report is intended to help New Yorkers evaluate these concerns based on the facts about auto use in the Manhattan CBD. This report synthesizes the widest range of information ever brought together for analysis of auto use in the Manhattan CBD. The report includes information from newly available 2004 CBD screenline traffic counts, 2004 American Community Survey results recently released by the U.S. Census Bureau, 2000 Census data analyzed at the census tract level, a regional household travel survey and a recently completed large-scale regional travel model. These data paint a detailed and multifaceted portrait of the Manhattan CBD auto user.

Plan of the report

The report is structured in five sections:

1) Myths and facts about auto use in the CBD, addressing five commonly held myths about how people travel in New York.

2) The role of personal cars in the overall traffic mix, showing that personal auto trips account for most motor vehicle traffic in the CBD.

3) A profile of who drives in the CBD, for what purposes, and between what origins and destinations.

4) A detailed analysis of key topics regarding auto use:
    - The importance of traffic that passes through the CBD but has neither origin nor destination within the CBD.
    - The virtually insignificant role of the auto for the 560,000 people who live in the CBD.
    - Why auto commuters drive instead of taking transit, and what would attract them to use transit.
    - What London's experience with congestion pricing says to the potential for reducing auto use in New York City.

5) What the report's findings mean for New York City transportation policy.

Section I.

FIVE MYTHS ABOUT AUTO USE IN THE MANHATTAN CENTRAL BUSINESS DISTRICT

Myth 1: Current Auto Use Is Necessary to New York's Economic Vitality

Fact: 30-60% of cars entering the CBD are going someplace else -- these "through" drivers have no economic purpose in the CBD at all (details on page 35).

Myth 2: Auto Users Working in Manhattan Have to Drive - They Have No Option

Fact: Most auto commuters live near transit lines that would take them to work. That very few auto commuters lack transit options is shown by the fact that only 10% of auto commuters travel between home and work areas for which auto is the typical way to get to work in the CBD. (Details on page 50).

Myth 3: People Drive to Work Because They Need the Car for Other Trips During the Day

Fact: Few drivers use their cars for other CBD trips during the day -- 16% of those driving to work in the CBD make additional trips in the CBD before leaving the CBD.*

* Source: Author's analysis of 1997/98 Household Interview Survey.

Myth 4: Drivers are Wealthy People Who Will Drive No Matter What

Fact: The average household income of auto users is only $2,300 higher than the average of transit users.* (It should be remembered that transit users include wealthy Manhattan residents and suburban rail commuters -- two groups that have incomes substantially above those of people who drive to work.)

Fact: The industry group most likely to drive to work are government workers -- 33% of whom drive to work in the CBD, compared with 16% of all workers. Finance, real estate and professional service workers are no more likely to drive to work than the average Manhattan commuter.**

*Source: Author's analysis of 1997/98 Household Interview Survey.

**Source: 2000 Census.

Myth 5: Shoppers Are Auto-Dependent

Fact: Only 6% of shopping trips involve a car, while 69% of shoppers walk to the store and 24% use transit (which often includes walking access or egress as well).*

Fact: Shopping is also only a minor part of overall traffic. Of all CBD trips, only 4% are for shopping.*

*Source: Author's analysis of 1997/98 Household Interview Survey.

Section II.

THE AUTO SHARE OF CBD TRAFFIC

Auto Share of CBD Traffic - Introduction

On an average weekday, 830,000 motor vehicles enter the Manhattan CBD.* The majority of these vehicles are personal autos. Trucks, commercial vehicles and taxis, though vital to the functioning of the city's economy, account for less than one-half of vehicle trips in the CBD. Thus, looking at travel by personal auto is to look at the majority of motor vehicle trips in the CBD.

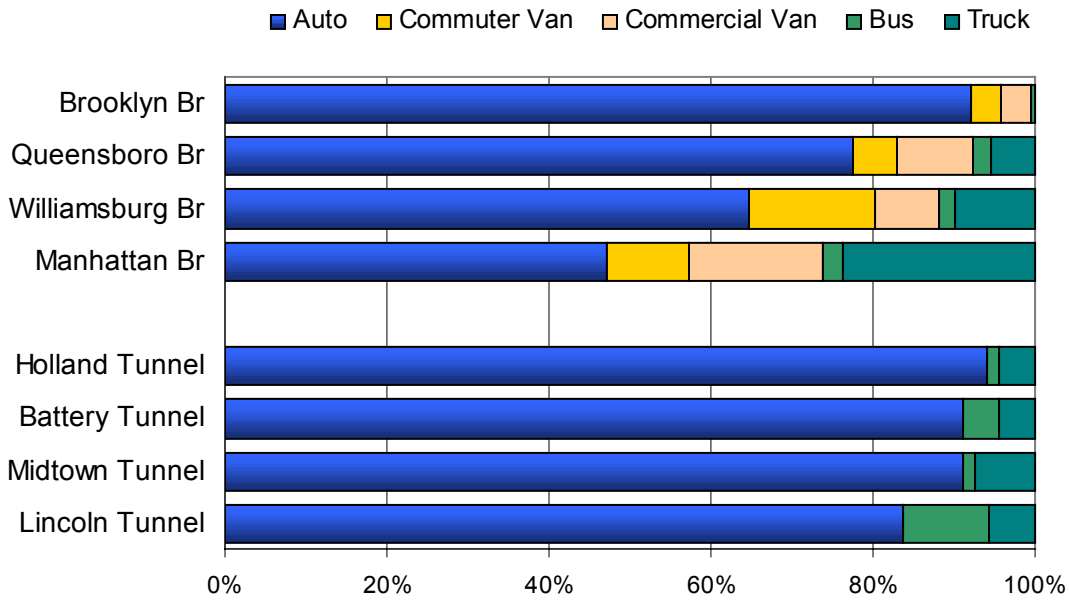
This section shows the mix of vehicle types entering the CBD and making CBD trips.

*Source: CBD screenline data provided by New York City Department of Transportation. The figure is for fall 2004, the latest available.

Personal Autos Comprise Most Vehicles at the Bridges and Tunnels

Autos comprise 74% of vehicles using East River bridges. Autos, commercial vans and light trucks comprise 89% of vehicles using tunnels into Manhattan.

- The Brooklyn Bridge has the highest auto share (92%) among East River bridges and the Manhattan Bridge the lowest auto share (47%).
- Truck and bus volumes at the tunnels are comparable to those on East River bridges.
- Auto volumes are not separated from commercial van and light trucks for tunnels, preventing an exact comparison in the auto share for the tunnels versus bridges.



Vehicle Classification at CBD River Crossings, 2003

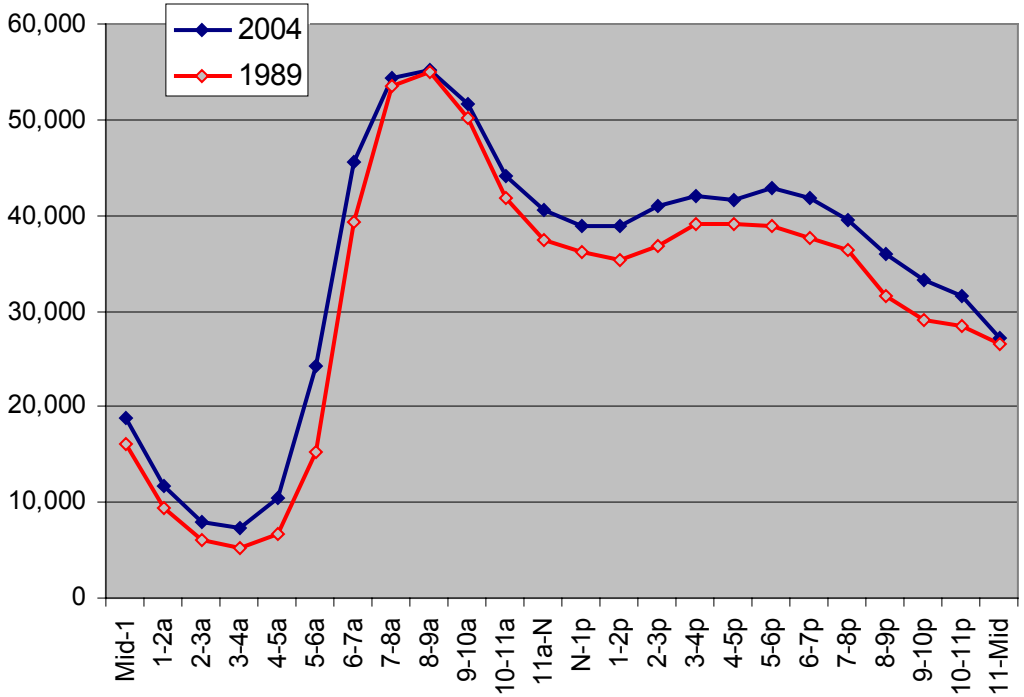
7 a.m. to 7 p.m., both directions. Vans and light trucks are included with autos for tunnels. The auto category includes autos used for commercial purposes.

Source: New York City Department of Transportation, "2003 Manhattan River Crossings."

Vehicle Entries Reach Capacity During the AM Peak

Vehicle entries to the CBD peak from 7-9 a.m. at 55,000 vehicles per hour -- a number unchanged since the late 1980s.

- Bridges, tunnels and roads leading into Manhattan are at or near capacity during the morning rush period. With virtually no room for growth, the number of vehicles entering the CBD between 7 and 9 a.m. has not changed since 1989.
- Vehicle entries have increased at the "shoulder" periods -- up 16% from for the 6-7 a.m. period and up 56% from 5-6 a.m.
- Vehicle entries have also grown during midday and in the evening: an increase of 9% from 1 p.m. to 8 p.m. and 14% from 8-10 p.m.



Vehicle Entries to CBD, by Hour

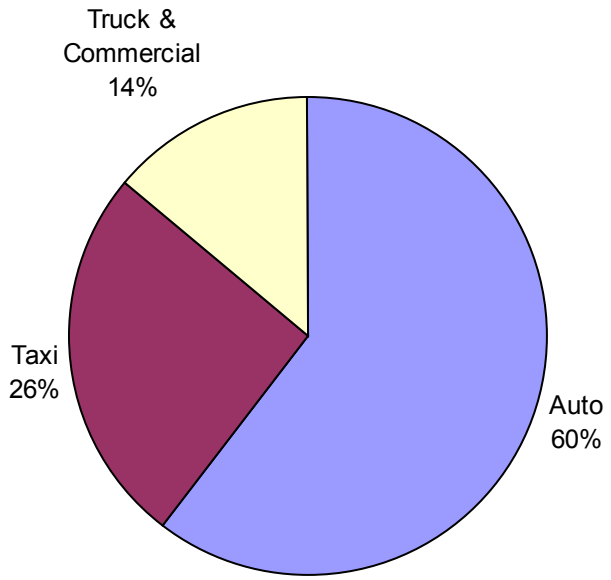
24-hour counts, all vehicles.

Source: CBD screenline traffic counts provided by New York City Department of Transportation.

Personal Autos Comprise Most Vehicles Traveling to CBD Destinations

Including both trips entering the CBD and trips within the CBD, autos comprise 60% of motor vehicle trips to CBD destinations.

- An estimated six in 10 CBD trips are by auto.
- One-quarter use taxi and liveries.
- Trucks and commercial vans account for approximately 14% of trips. (Actual commercial vehicle use is somewhat higher since some auto trips are for commercial purposes.)



Trips to CBD Destinations, by Type of Vehicle

Trips with destination in the CBD. Taxi includes taxis and liveries with passengers but not non-passenger trips.

Passenger cars used for commercial purposes are included in auto.

Source: New York Metropolitan Transportation Council (NYMTC) Best Practice Model, 2002 baseline. This source combines cars with driver and passenger (HOV2) and taxi categories; taxi and auto trips are assigned based on 49%drive/51% taxi in HOV2/taxi category.

Section III.

WHO, FROM WHERE, AND WHY?
AN OVERVIEW OF CBD AUTO TRIPS

Overview of Auto Trips - Introduction

Who uses the auto in the CBD, for what purposes, to reach what destinations?

This question does not have a simple answer. Many different types of people use cars and for a variety of purposes. Auto users' characteristics, origins, destinations and trip purposes also vary by time of day.

This section profiles the who, why, where and when of auto travel. The focus is on the user of the personal auto, distinct from autos used for commercial purposes and from taxis and liveries.

Why Drive?

The primary reasons to use an automobile, in the Manhattan CBD as elsewhere, are speed of travel, comfort and convenience.

- **Speed of travel.** "Mode choice" studies in NYC and elsewhere have documented that the #1 factor governing whether to drive or use transit is travel time. Especially among time-sensitive New Yorkers, mode choice in the CBD is ruled foremost by which mode will get you there the fastest. Sometimes the answer is the car. Often the answer is the subway or walking -- and occasionally the bus.
- **Convenience and comfort.** In addition to a speedy trip, people want the convenience of door to door service, no waiting for a train or bus to arrive, and the comfort of being seated and in control of their environment -- noise, temperature control, etc. Despite vast improvements in bus and subway service, cars (and taxis) guarantee a seat -- cushioned at that! -- and are more private and more under the traveler's control.

Other reasons for using auto or other modes are specific to the type of trip being taken. The car may be attractive for people with packages, for late-night travel, in adverse weather, for elderly and disabled persons, and a host of other trip-specific reasons.

Why Not Drive?

Lack of parking and cost are compelling reasons not to drive -- so compelling that the large majority of trip-making in the CBD is by foot, bus, subway and bicycle.

- **Lack of parking.** The most tangible reason not to drive for those who own a car is the dearth of free or low-cost parking in Manhattan. Availability of "free" parking, including parking paid for by employers, is remarkably associated with driving into the CBD. In a 1997/78 survey, only 15% of motorists driving into the CBD reported having paid for parking.*
- **Cost.** Even if they have free parking, motorists must pay tolls, gasoline, maintenance and depreciation costs on the vehicle.

Why isn't traffic congestion on this list? Traffic often approaches walk speeds, and in fact, taxi passengers sometimes abandon their cab short of their destination when walking will get them there more quickly.

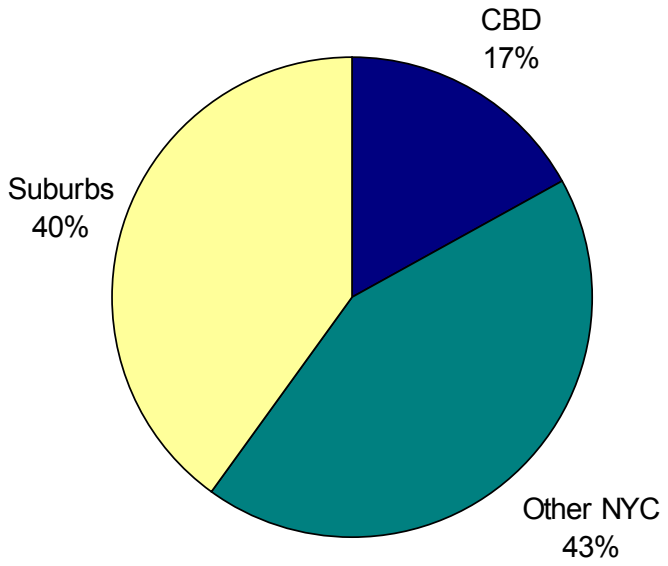
For some trips, congestion is a deterrent to using a car. Overall, however, congestion is not a primary reason to avoid driving. Slow though the car can be at times, buses are even slower. The subway is faster for some trips, but at least for work trips as will be discussed later, commuting by car is usually faster than commuting by transit.

* Source: Author's analysis of 1997/98 Household Interview Survey, conducted for the New York Metropolitan Transportation Commission and North Jersey Transportation Planning Authority.

Who Drives: Most Auto Users Live in NYC

NYC residents account for 60% of trips with CBD destinations while suburbanites account for the remaining 40% of trips.

- CBD residents make 17% of CBD trips.
- Manhattan residents living above 60th Street account for only 5% of trips with CBD destinations.
- Brooklyn, Queens, Bronx and Staten Island residents make 39% of trips to CBD destinations.
- Among suburban areas, New Jersey accounts for 21% of trips and Long Island 11%.
- Westchester and other counties north of the city account for only 7% of trips to CBD destinations.



Trips to CBD Destinations, by Place of Residence

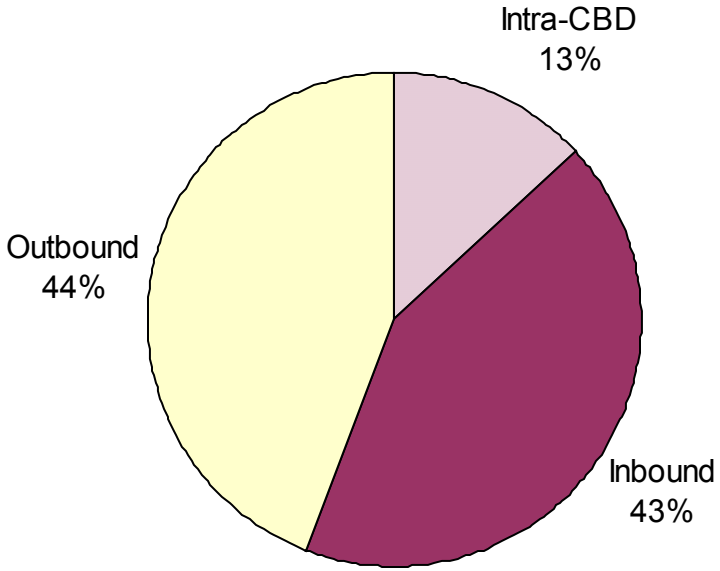
Auto trips with destinations in the CBD. Includes both inbound trips and trips within the CBD.

Source: 1997/98 Household Interview Survey, conducted for the New York Metropolitan Transportation Commission and North Jersey Transportation Planning Authority.

Most Trips are Inbound or Outbound

Seven in 8 auto trips are either inbound (entering the CBD from elsewhere) or outbound (leaving the CBD), while 1 in 8 are intra-CBD trips.

- 43% of all auto trips bring people into the CBD.
- 44% take people outside the CBD.
- 13% of auto trips are intra-CBD (both origin and destination in the CBD).
- Like the auto, transit primarily takes people in or out of the CBD -- only 12% of transit trips have both origin and destination in the CBD.
- Taxis (42%) and walk (90%) are much more focused on intra-CBD trips.



Auto trip volumes

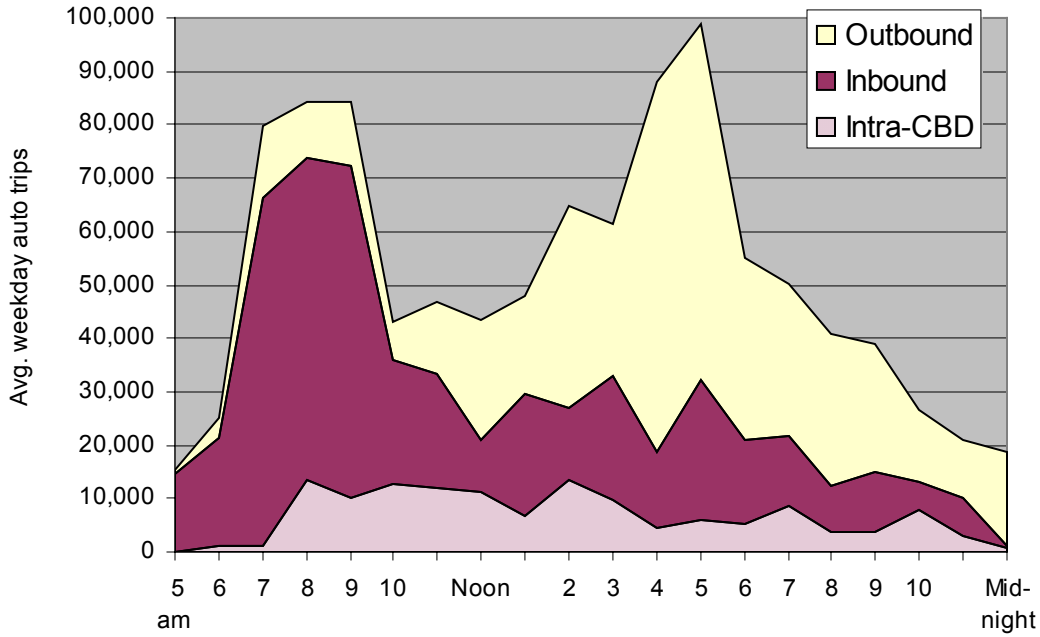
Outbound, inbound and intra-CBD trips, weekdays.

Source: 1997/98 Household Interview Survey.

Cars Travel Mainly Inbound in AM, Outbound in PM

Inbound trips dominate the morning peak period and outbound trips dominate the afternoon peak. Even midday, however, inbound and outbound trips outnumber intra-CBD trips.

- Intra-CBD trips are only 22% of auto trips from 10 a.m. to 4 p.m., compared with 14% of trips between 8 a.m. and 10 a.m.



Auto trip volumes

Outbound, inbound and intra-CBD trips, by arrival time in AM and departure time in PM, weekdays.

Source: 1997/98 Household Interview Survey.

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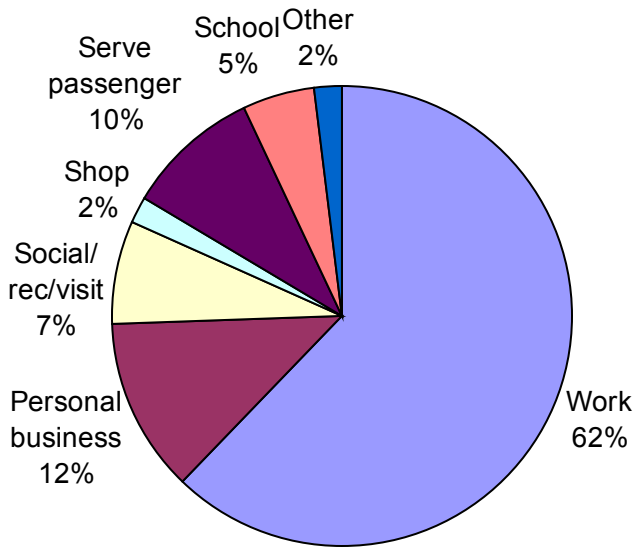
In AM Peak, Most Auto Trips Are for Work

Trips to the CBD in the morning are heavily work-oriented, with some personal business and social/recreational trips.

- 62% of trips to CBD destinations between 6 a.m. and 10 a.m. are to work.
- 12% of trips are for personal business.
- 10% of trips are classified as "serve passenger," e.g., dropping off someone.



Trips to CBD Destinations, 6-10 a.m.

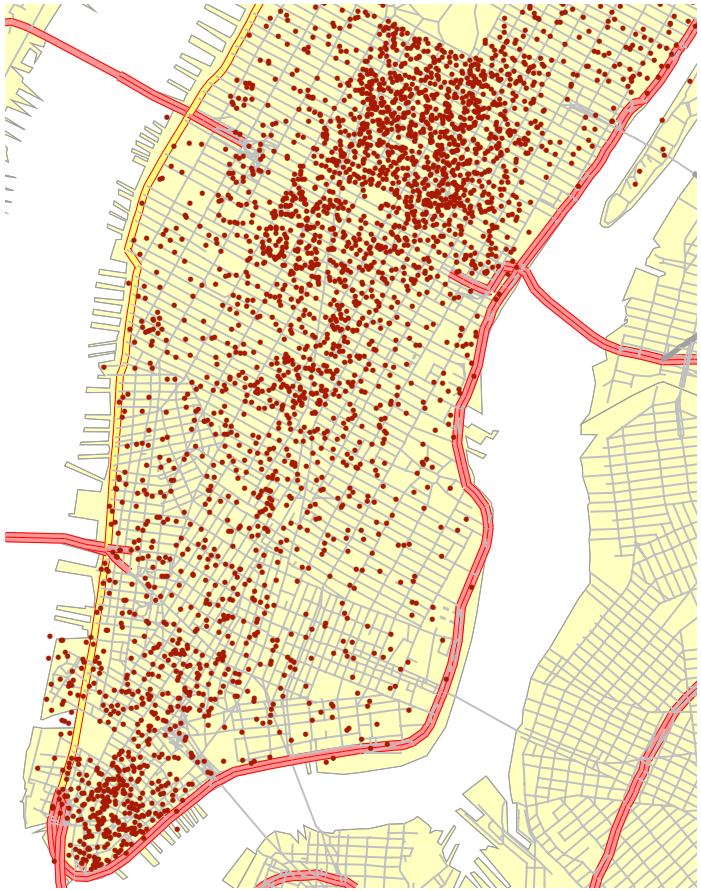
Trips with destinations in the CBD, arriving between 6 a.m and 10 a.m. Includes both inbound trips and trips within the CBD.

Source: 1997/98 Household Interview Survey.

AM Destinations are Predominantly Job Centers

Auto destinations from 6-10 a.m. are focused on job-rich Midtown and Downtown business districts.

- Not surprisingly, the heaviest concentrations of auto trips are to Midtown and Downtown Manhattan.
- The “Valley” (Canal to 14 Street) attracts 1/3 to 1/2 the density of trips as do Midtown and Downtown.



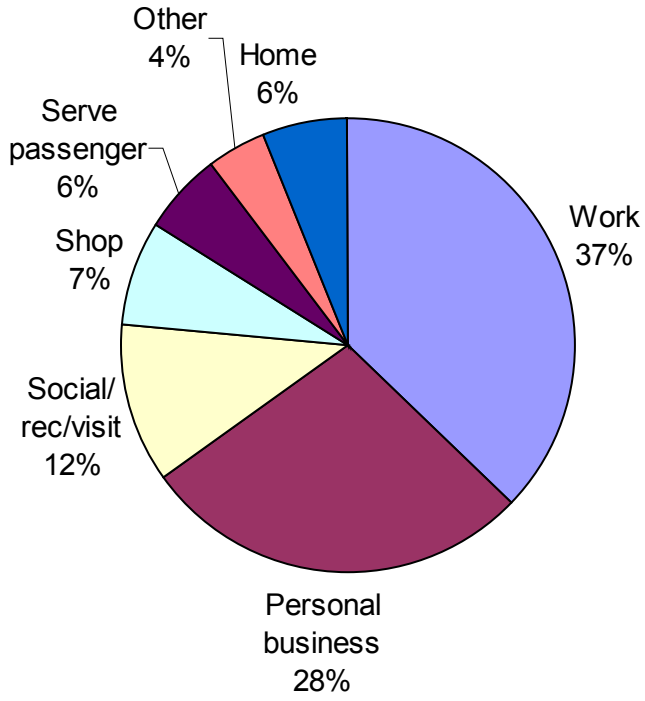
Trips to CBD Destinations, 6-10 a.m.

Estimated by census tract. One dot = 40 trips by auto.
Source: NYMTC Best Practice Model.

Midday, A Mix of Purposes

Midday, purposes of trips to CBD destinations are divided among work, personal business and social, recreational and visiting.

- 37% of CBD trips are going to (or returning to) work from 10 a.m. to 4 p.m.
- 28% are for personal business.
- 12% are for social, recreational and visiting.



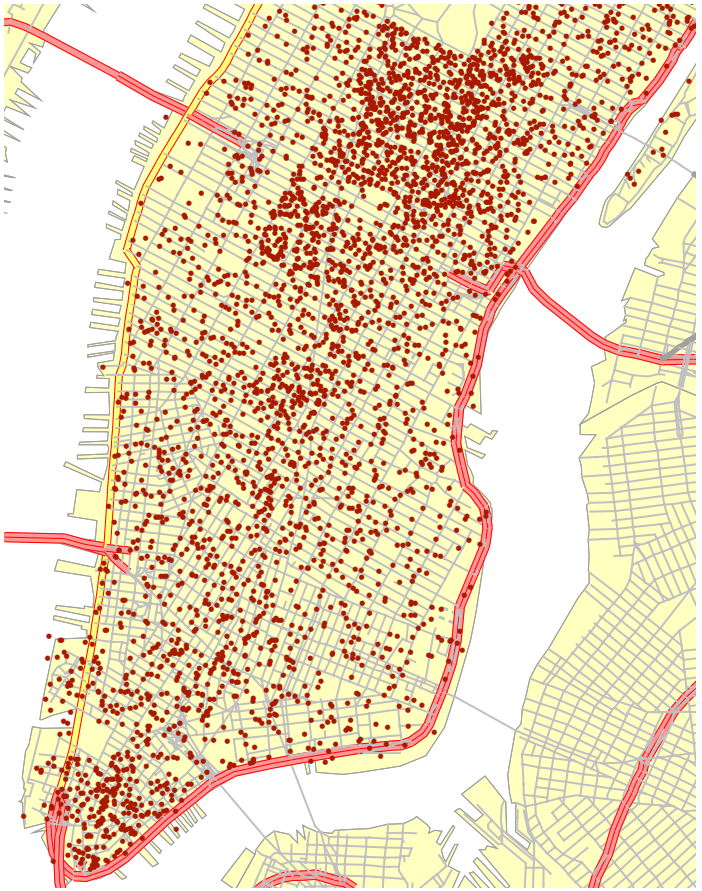
Trips to CBD Destinations, 10 a.m. to 4 p.m.

Trips with destinations in the CBD. Includes both inbound trips and trips within the CBD.

Source: 1997/98 Household Interview Survey.

Midday Destinations are Also Predominantly in Midtown and Downtown

As in the AM peak, auto destinations from 10 a.m. to 4 p.m. are focused on the Midtown and Downtown business districts.



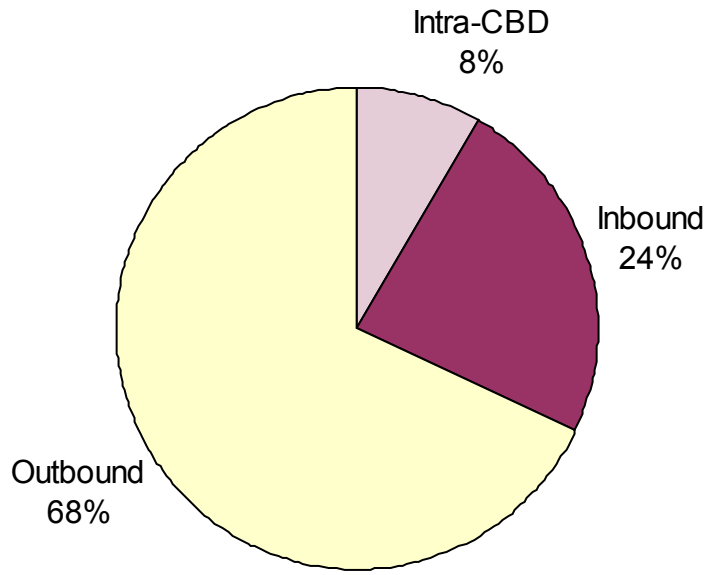
Trips to CBD Destinations, 10 a.m. to 4 p.m.

Estimated by census tract. One dot = 40 trips by auto.
Source: NYMTC Best Practice Model.

In PM Peak, Most Auto Trips Leave the CBD

In the PM peak, 68% of trips involving the CBD are leaving the CBD.

- 65% of these outbound trips are bound for home. Thus, the pattern of these trips in the PM peak is the mirror of the AM peak.



Trips to CBD Destinations, 4-8 p.m.

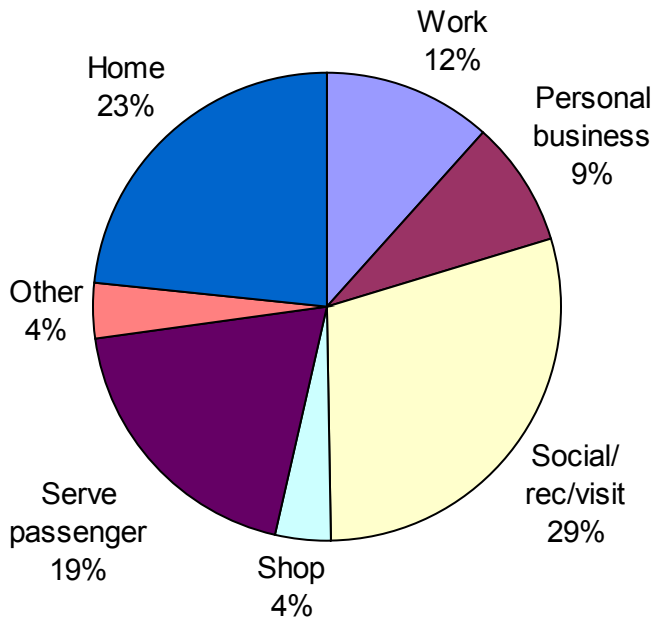
Outbound, inbound and intra-CBD trips, departing between 4 p.m. and 8 p.m.

Source: 1997/98 Household Interview Survey.

CBD-bound Trips in PM Peak Are For Non-Work Purposes

Trips to CBD destinations in the PM peak are primarily for social and recreational purposes and going home.

- 29% for social, recreational and visitation purposes.
- 23% are going home.
- 19% are serving passengers.
- 12% are going to work.



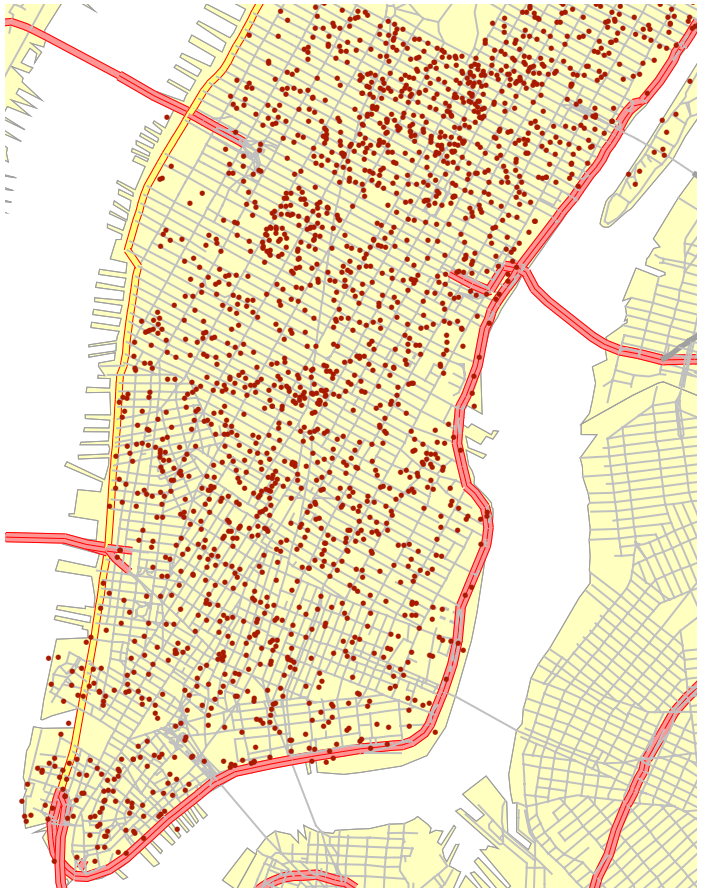
Trips to CBD Destinations, 4-8 p.m.

Trips with destinations in the CBD, arriving between 4 p.m and 8 p.m. Includes inbound trips and trips within the CBD but not trips leaving the CBD (most of which are home-bound).

Source: 1997/98 Household Interview Survey.

PM Destinations are Scattered Throughout the CBD

CBD auto destinations from 4 p.m. to 8 p.m. are scattered across the CBD.



Trips to CBD Destinations, 4-8 p.m.

Estimated by census tract. One dot = 40 trips by auto.
Source: NYMTC Best Practice Model.

Section IV.

KEY TOPICS

Through Traffic

Although it is easy to think of the bridges and tunnels leading into the CBD as primarily serving CBD trips, this is actually only partly the case. Drivers and truckers from Long Island, Brooklyn and Queens use the Battery and Midtown tunnels and three East River bridges to reach points in New Jersey and north of the city. Likewise, motorists and truckers use the Lincoln and Holland Tunnels to reach destinations in Brooklyn, Queens and Long Island.

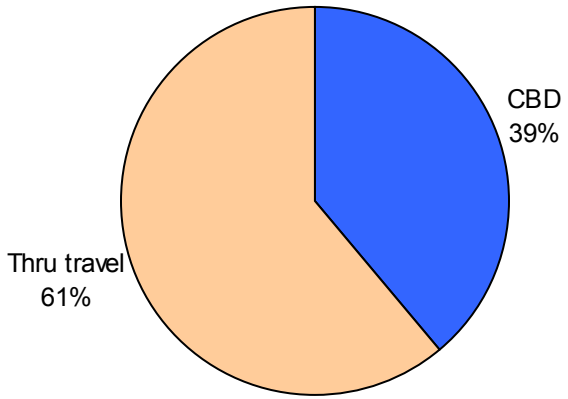
Although it may seem counterintuitive that anyone would choose to enter the CBD who is not CBD-bound, congestion on the Verrazano, Triborough and George Washington bridges, the Cross-Bronx and Staten Island expressways and other alternate routes discourages drivers from diverting away from the CBD. In addition, one-way tolls on the Verrazano Bridge encourage truckers to use Canal Street and East River bridges for westbound trips.

Thus, a significant portion of the vehicles entering the CBD are bound for destinations on the other side of the CBD, as shown for East River and Hudson River crossings on the next two pages.

Through Traffic at East River Bridges

3/5 of drivers using East River bridges are simply passing through the CBD, destined for upper Manhattan or points north or to New Jersey.

- About 1/2 of the through trips are to other parts of NYC and about 1/2 are headed outside the five boroughs.
- During the morning peak period, when the bridges are the most congested, about 1/2 of westbound drivers are headed outside the CBD. Due to small sample size (153 trips), this should be viewed as a rough estimate, however.



Destination of Westbound Trips Crossing East River Bridges

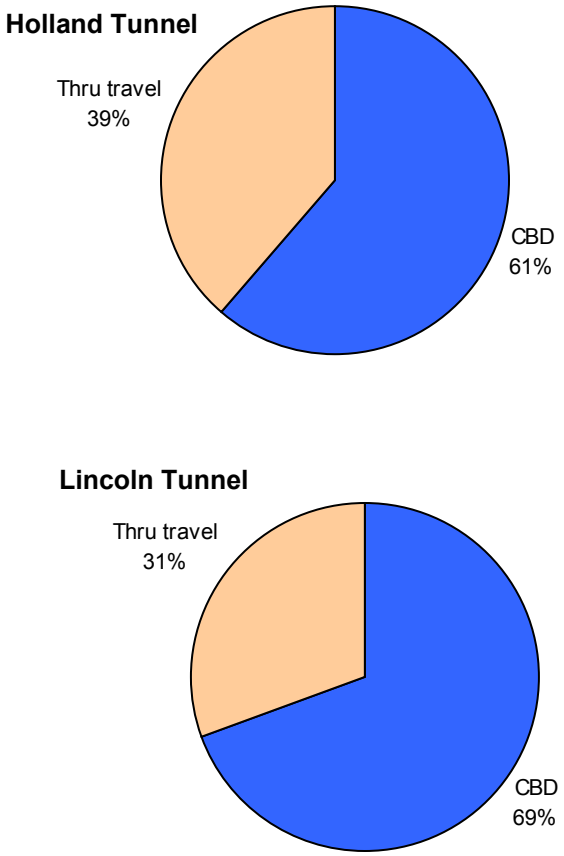
Drivers traveling from Brooklyn, Queens and Long Island to Manhattan, the Bronx and destinations north and west.

Source: 1997/98 Household Interview Survey.

Through Traffic at Hudson River Tunnels

At the Holland and Lincoln Tunnels, about 1/3 of autos are merely passing through the CBD.

- 39% of autos at the Holland Tunnel and 31% at the Lincoln Tunnel have destinations outside the CBD.
- Through travelers at the Lincoln Tunnel are about equally split between upper Manhattan destinations and other destinations (primarily Queens and Brooklyn).
- Through travelers at the Holland Tunnel are primarily going to Brooklyn and Queens.
- Through travel is slightly lower during the morning peak: 31% at the Holland Tunnel and 21% at the Lincoln Tunnel.



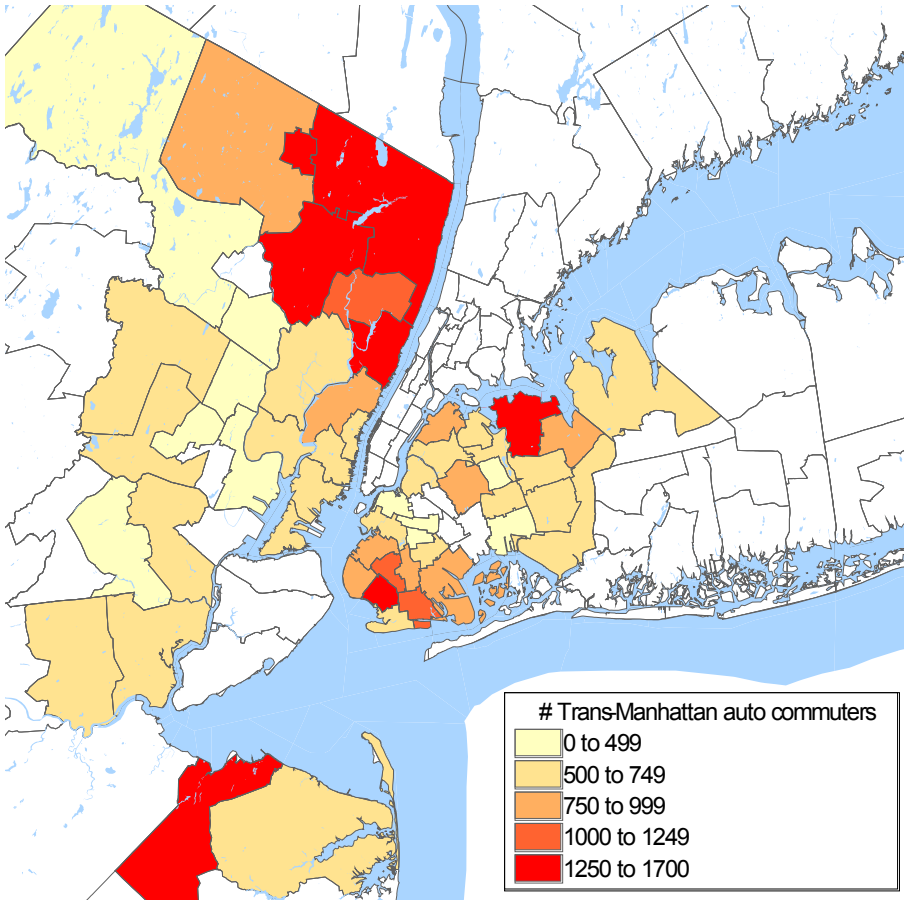
Destination of Eastbound Trips Crossing the Hudson River, 1989

Source: Port Authority of New York and New Jersey, "Vehicular Origin and Destination Survey - 1989." Published in New York City Department of Transportation, "2003 Manhattan River Crossings."

Where Through Commuters Live

Through auto commuters primarily live in northeast Queens, southern Brooklyn and Bergen County, New Jersey.

- These are areas with relatively low access to subway and commuter rail services.
- Note that these commuters may use upper Manhattan, Bronx and Staten Island routes as well as CBD routes in the commute.



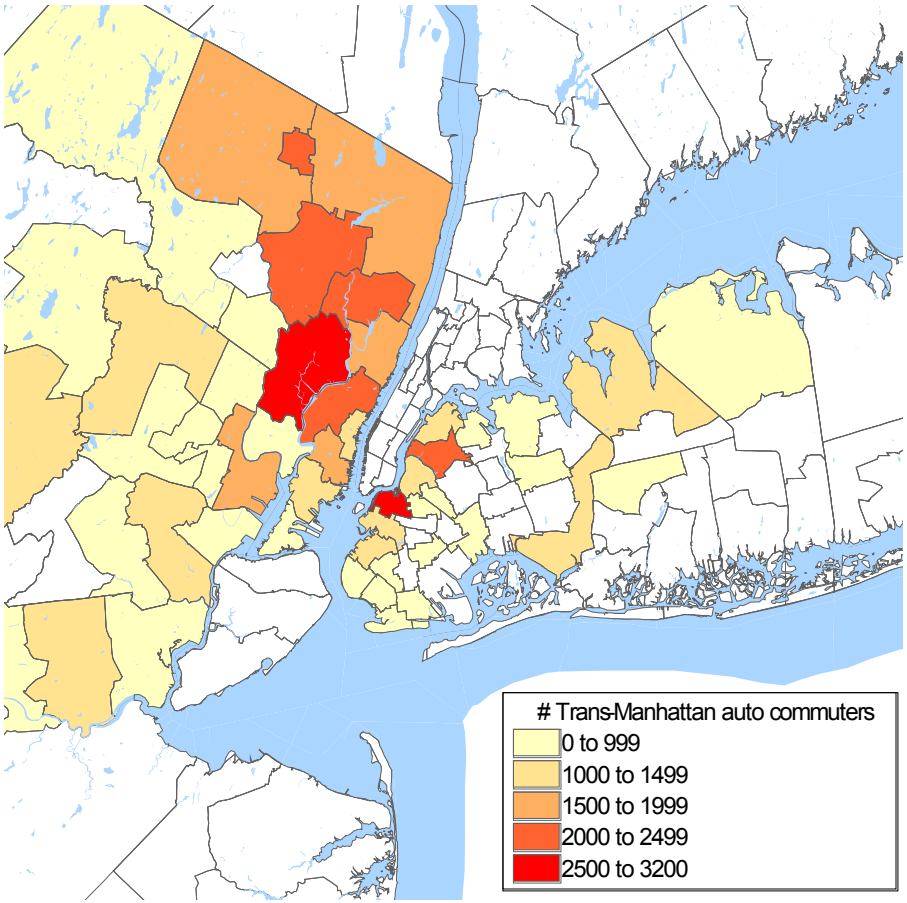
Place of Residence of Trans-Manhattan Commuters

Place of residence of workers commuting by auto from New Jersey to Brooklyn, Queens or Long Island or vice versa. Shown for zones with 600 or more trans-Manhattan commuters (all modes). Source: 2000 Census.

Where Through Commuters Work

Through auto commuters primarily work in Meadowlands and Secaucus areas in New Jersey and in downtown Brooklyn and Long Island City, Queens.

- Brooklyn and Queens work destinations have good transit access but New Jersey destinations may not, depending on the exact workplace.



Place of Work of Trans-Manhattan Commuters

Place of work for workers commuting by auto from New Jersey to Brooklyn, Queens or Long Island or vice versa. Shown for zones with 600 or more trans- Manhattan commuters (all modes). Source: 2000 Census.

Role of Auto for CBD Residents

Role of Auto for CBD Residents - Introduction

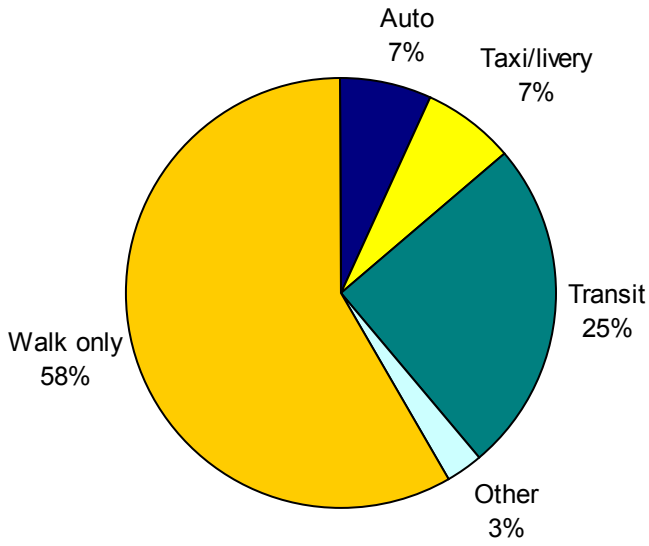
Given that 560,000 people live in Manhattan below 59th Street, use of autos by CBD residents merits special attention. To the extent that CBD residents travel by auto, they could potentially generate a sizeable number of CBD trips. CBD residents are likely to have different travel needs than those living elsewhere, with significant numbers of non-work and off-hour trips. Policies affecting auto use in the CBD are also likely to be of particularly intense interest to residents -- a reason that London provides a 90% congestion charge exemption to its CBD residents.

The next two pages examine how CBD residents travel within the CBD and their share of total CBD auto use.

CBD Residents Do Not Rely on the Auto

Auto is used for only 7% of CBD residents' trips to CBD destinations.

- 58% of trips are walking
- 25% of trips are by transit



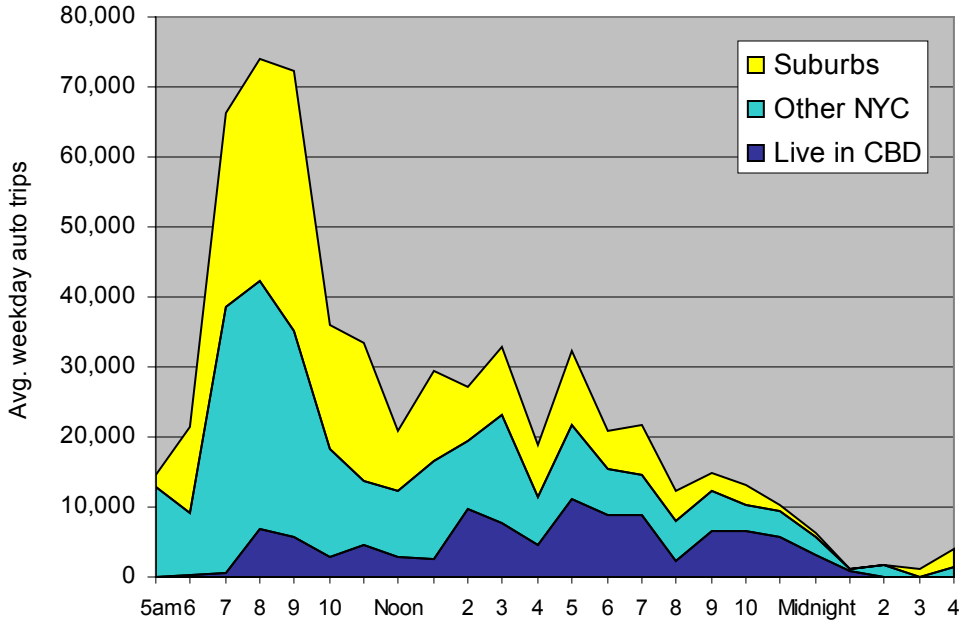
Trips to CBD Destinations by CBD Residents, by Mode

Source: 1997/98 Household Interview Survey.

CBD Residents Account for Few of the CBD's Auto Trips

CBD residents account for 17% of trips with CBD destinations.

- Residents' share of total auto trips to CBD destinations grows from 6% in the morning to 17% midday and 36% in the evening peak. (Note that these figures do not include outbound trips.)



Trips to CBD Destinations by Place of Residence

Includes both inbound trips and trips within the CBD.

Source: 1997/98 Household Interview Survey.

Driving to Work in the CBD

Driving to Work in the CBD - Introduction

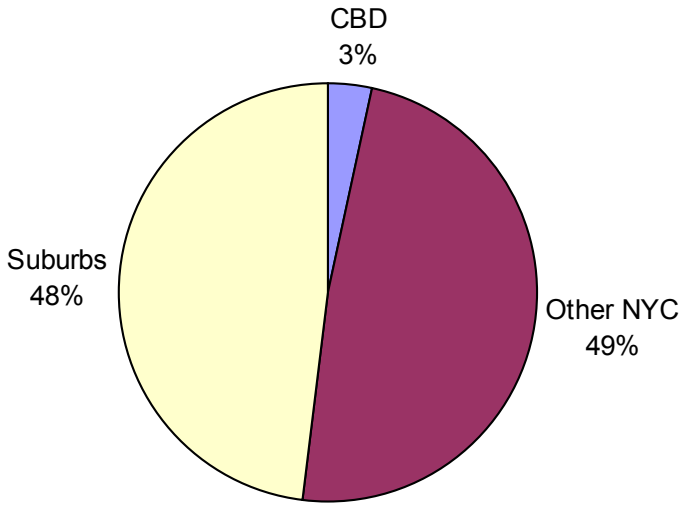
Over 272,000 people drive to work in the CBD each day, according to the 2000 Census. While this is only 16% of all CBD workers, the lowest figure in the country, the absolute number of auto commuters is quite large. By way of comparison, approximately the same number of people commute by auto to Midtown Manhattan as to downtown Los Angeles, two downtown office districts of comparable land area.

Work trips represent about one-half of all auto trips to CBD destinations and are thus a major part of the overall traffic flow. They are an even larger share of auto trips during the morning rush period, especially for vehicles entering the CBD. Because of their large number and obvious importance, work trips merit special understanding and analysis. This section profiles auto commuters, analyzes why people drive to work in the Manhattan CBD and what would be important to attracting auto users to transit.

Auto Commuters Split Evenly Between NYC and Suburbs

52% of auto commuters live in New York City while the remaining 48% live in the suburbs.

- 19% of CBD auto commuters live in Queens
- 12% live in Brooklyn
- 6% live in the Bronx
- 6% live on Staten Island
- 6% live in Manhattan above 60th Street
- 3% live in the CBD
- 12% live on Long Island
- 11% live in Westchester and other counties north of the city
- 21% live in New Jersey
- 2% live in Connecticut and 2% in the rest of the U.S.



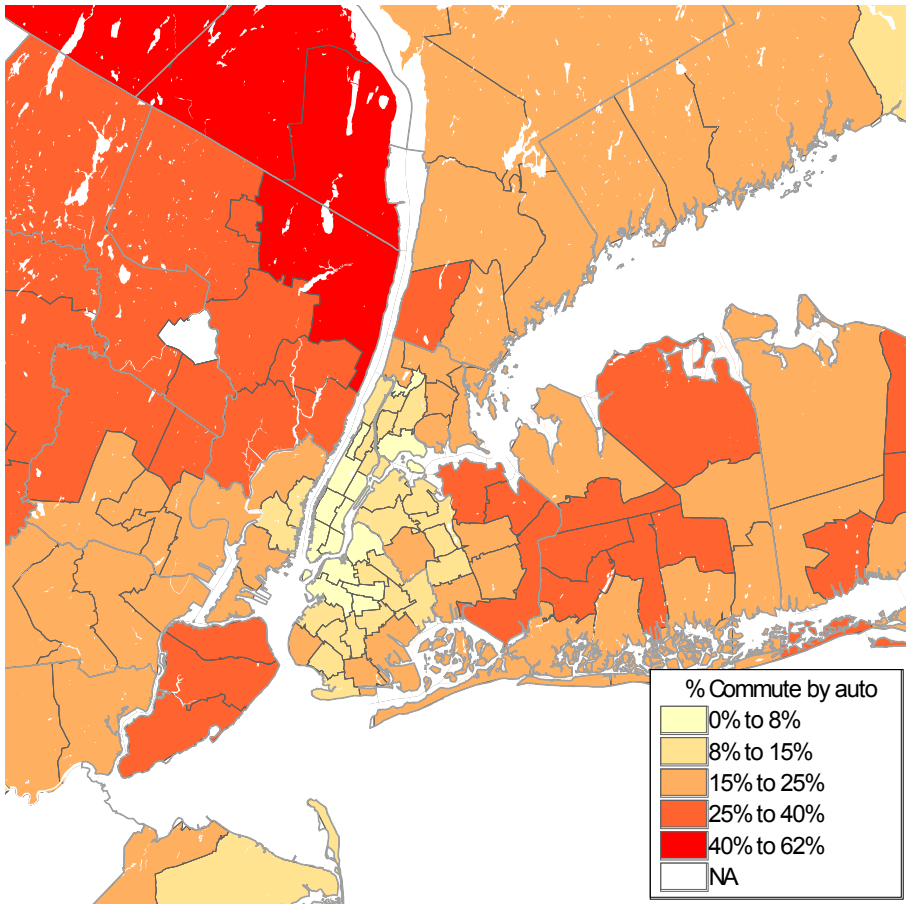
CBD Auto Commuters by Place of Residence

Source: 2000 Census. (Census data are from the Census Transportation Planning Package, Part 3, showing tract-to-tract journey to work patterns.)

Reliance on Auto Grows with Distance from the CBD ...

Suburban workers are more likely to commute by auto than city workers -- though transit is the predominant mode to the CBD in nearly all of the NY region.

- Fewer than 10% of CBD workers who live in Manhattan commute by auto.
- 6-10% of CBD workers who live in neighborhoods close to Manhattan -- e.g., South Bronx, Astoria, Long Island City, Williamsburg, Bed-Stuy, Park Slope and Brooklyn Heights -- commute by auto.
- Auto commutation rises to about 20% of CBD workers in eastern Queens, northern Bronx, southern Brooklyn and Essex and Union Counties in NJ.
- About 40-60% of CBD workers commute by auto from Rockland County, far eastern Suffolk County, northeastern part of Bergen County, NJ and western part of Morris County, NJ.

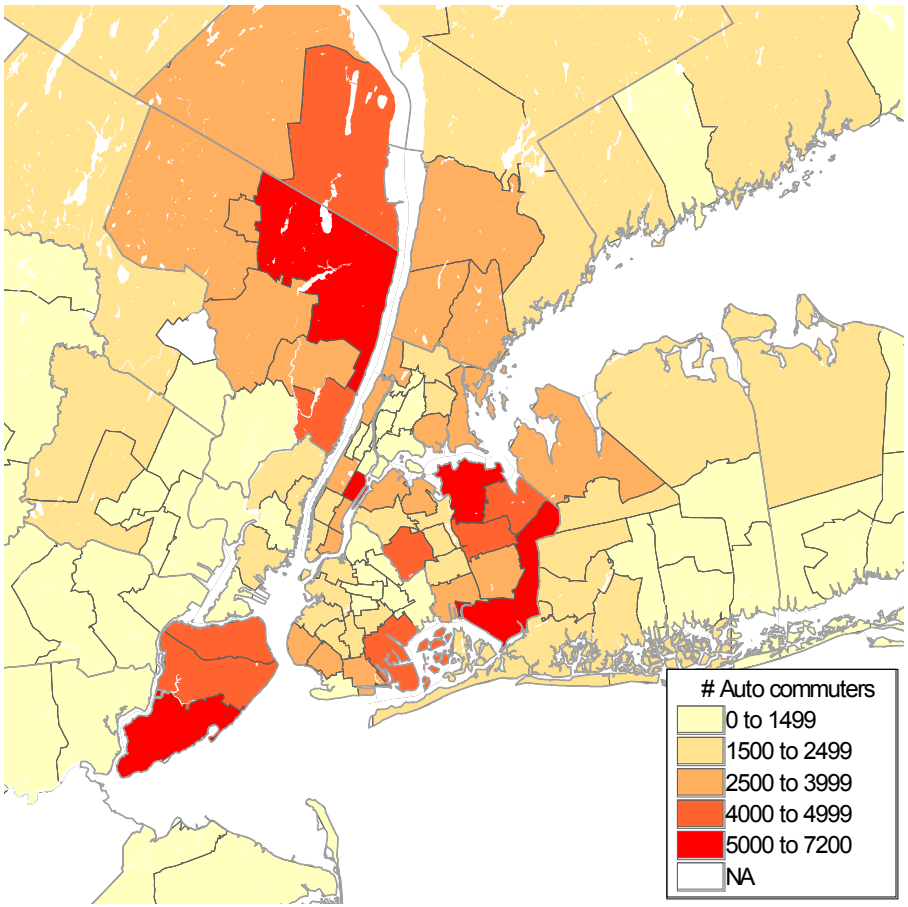


Percent of CBD Workers Commuting by Auto

Percent of CBD workers who commute by auto, by place of residence.
NA=fewer than 600 total CBD workers. Source: 2000 Census.

… Although There are Heavy Concentrations of Auto Commuters in NYC

The actual number of auto commuters are greatest in eastern Queens, southern Brooklyn and Staten Island.



Number of CBD Workers Commuting by Auto

Number of CBD auto commuters by place of residence. NA=fewer than 600 total CBD workers.

Source: 2000 Census.

Auto Use and Transit Access

One might expect that given traffic congestion and the cost of parking, people who drive to work in the CBD “have to” drive. They might “have to” drive due to lack of public transportation from their place of residence, or because of job requirements, or for some other reason.

There are undoubtedly certain reasons, like needing the car for the job, that cause some people to drive to work. As discussed below, the likely number of such persons appears to be relatively low, however.

Lack of access to transit services also fails to explain the number of people who commute by auto to the CBD. Virtually the entire metro area has transit service to the CBD. The high degree of transit accessibility is summarized on the next page.

Auto Use and Transit Access

Nearly all CBD trips have a viable transit option.

- 64% of CBD auto commuters live near rail access to the CBD, as shown for three commuter-heavy counties on the next three pages.
- In every county in the metro area, the majority of CBD workers take other modes (rail, bus, walk, taxi) to work, with the exception of Rockland County, NY.
- At a finer-grained level, using home zones within counties and work zones within the CBD, 90% of auto commuters commute from home to work zone pairs in which a majority of commuters use other modes. In other words, only 10% of auto commuters make journey to work trips in which auto is the typical way to get to work in the CBD.

The transit option is, for most commuters, time-competitive with the auto.

- 49% of auto commuters have a transit option that would take no more than 10 minutes longer than their auto trip.
- 80% of auto commuters have a transit option that would take no more than 15 minutes longer than their auto trip.**

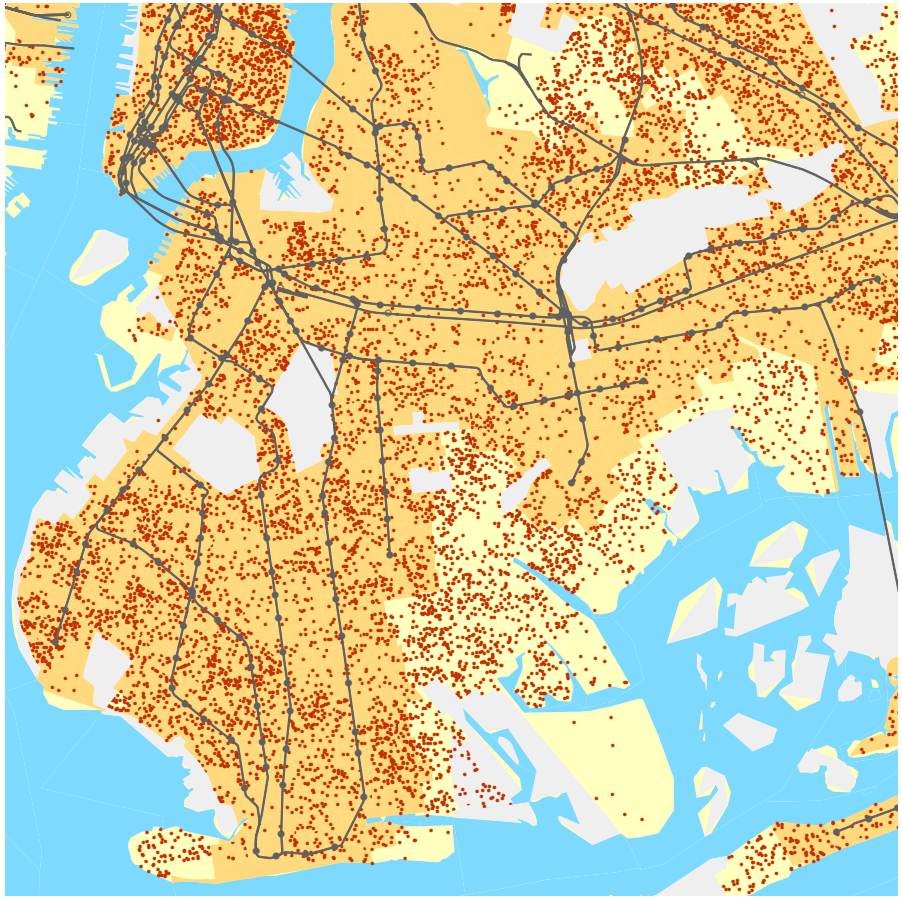
***** For purposes of making this computation, ”near rail access” is defined as census tracts that lie within 2/3 of a mile of a subway or commuter rail station in New York City and Hudson County, NJ, and within 2 miles of a commuter rail station in other suburbs. Included in this group are census tracts that are entirely within 2/3 or 2 miles and those that are mostly within this boundary.

** These figures are based on average transit and auto commute times calculated from home-to-work zones within counties.

Most Auto Commuters Live Near Transit

In Brooklyn, which has the most auto commuters of any borough or county in the metro area, 80% of auto commuters live close to a subway station.

- For comparison, 93% of subway commuters live close to a subway station in Brooklyn.
- These figures are based on Census tracts that are within, or most of which are within, 2/3 mile of a subway station.



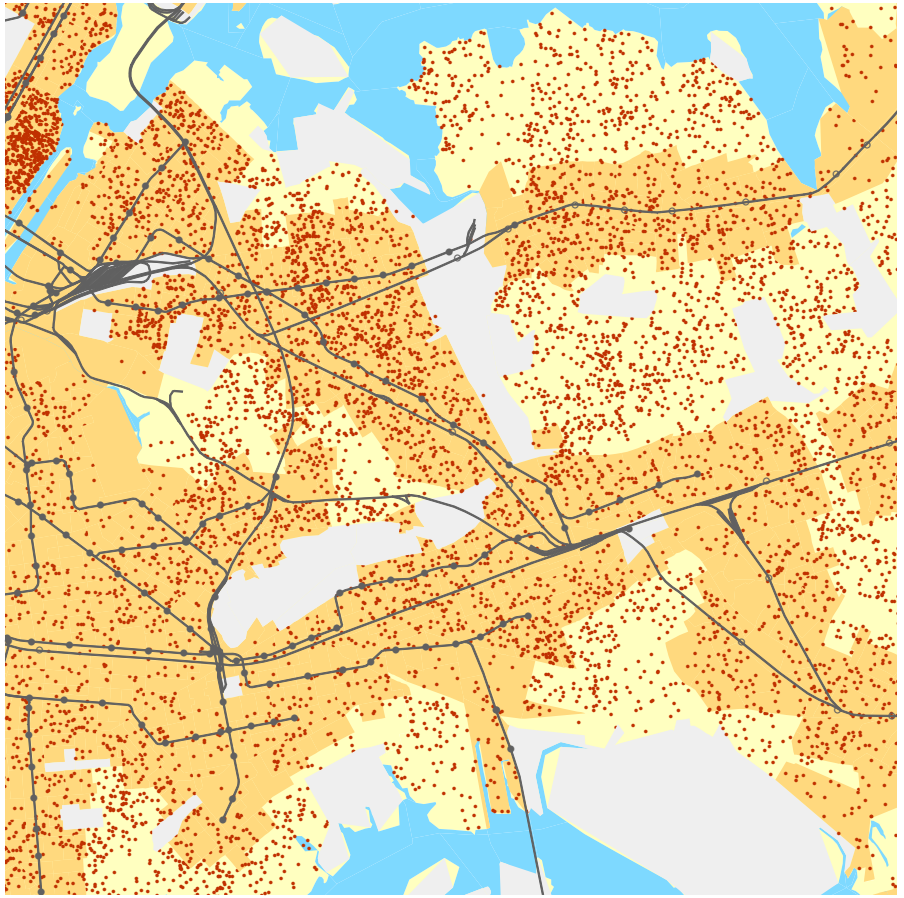
Auto Commuters Living in Brooklyn

CBD auto commuters living in Brooklyn, and subway lines and stations. Census tracts within 2/3 mile of a subway station are shaded. One dot = 5 auto commuters. Source: 2000 Census.

Most Auto Commuters Live Near Transit

In Queens, which has the second-most auto commuters of any borough or county in the metro area, 62% of auto commuters live close to a subway or LIRR station.

- For comparison, 85% of subway commuters live within approximately 2/3 mile of a subway or LIRR station in Queens.



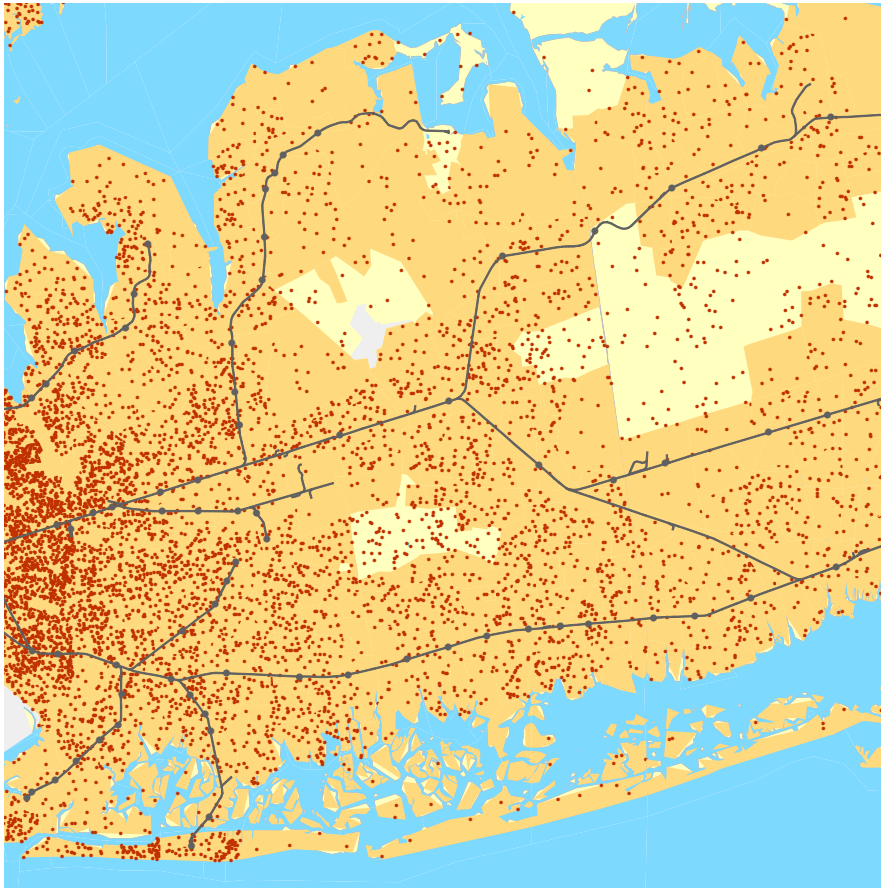
Auto Commuters Living in Queens

CBD auto commuters living in Queens, and subway stations and LIRR stations. Census tracts within 2/3 mile of a subway or LIRR station are shaded. One dot = 8 auto commuters. Source: 2000 Census.

Most Auto Commuters Live Near Transit

In Nassau County, which has the third-most auto commuters of any borough/county in the metro area, 97% of auto commuters live close to an LIRR station.

- For comparison, 96% of LIRR commuters live close to an LIRR station in Nassau County.
- In Suffolk County, 82% of both auto and LIRR commuters live within 2 miles of an LIRR station.



Auto Commuters Living on Long Island

CBD auto commuters living in Nassua County and western Suffolk County, and LIRR rail lines and stations. Census tracts within 2 miles of an LIRR station are shaded. One dot = 5 auto commuters. Source: 2000 Census.

The Importance of Travel Time to the CBD

If, with some exceptions, CBD workers tend to have access to rail service to the CBD, what explains why 270,000 people (16% of CBD workers) drive to work? While no single factor explains mode choice of Manhattan CBD commuters, one factor stands out: the **difference in travel time between transit and driving**. While other factors such as transit accessibility and travel times to the CBD play an important role, a central factor in mode choice is the relative commute times of auto and transit. Put simply, people tend to use the faster mode.

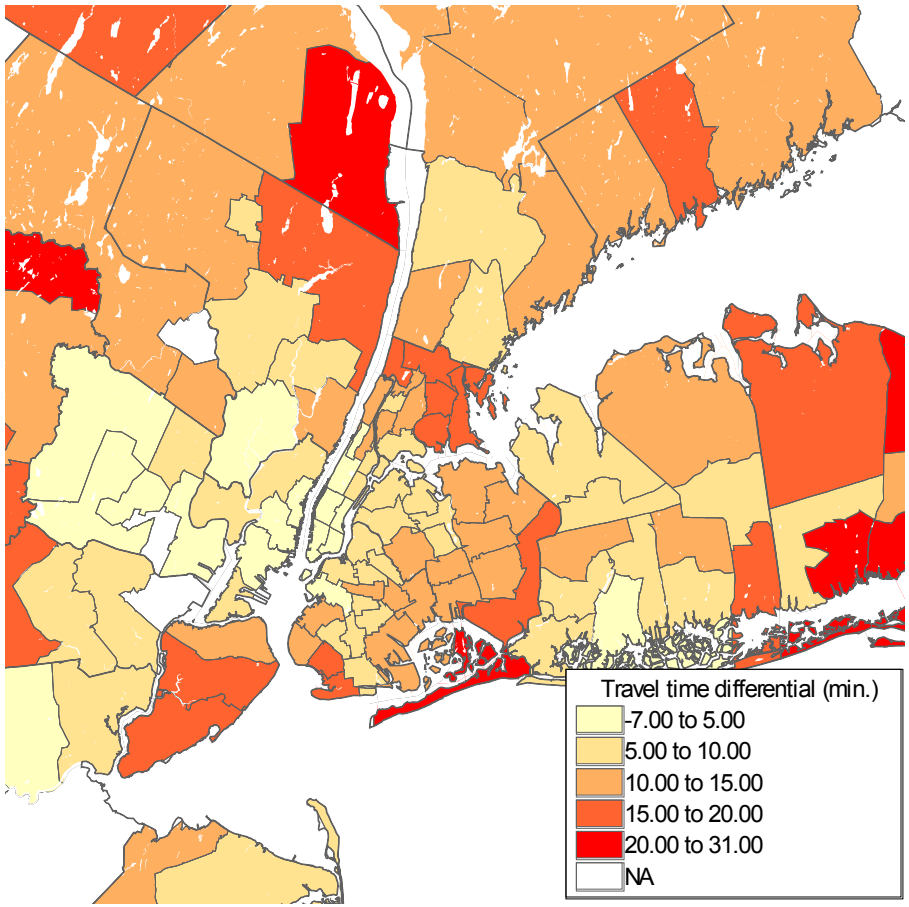
The next several pages explore this relationship in greater depth. The analysis uses travel times computed from home zones within each county to work zones within the CBD. This approach makes for a reasonably precise comparison of auto and transit travel times and thus show the impact of travel time differentials for people traveling between the same home and work areas.

Home zones used in the analysis are depicted in the map on the next page. Work zones within the CBD are formed around rail and bus services available to city and suburban residents. For example, there is a zone around Penn Station for Long Island and New Jersey residents and a separate zone to capture trips of commuters that probably transfer to a bus, subway or taxi.

Travel Time Differentials in the Region

The difference between auto and transit travel times is greatest in areas that also have heavy concentrations of auto commuters.

- Within NYC, the largest travel time differentials are in eastern Queens, southern Brooklyn and Staten Island, which also have the largest number of auto commuters.
- Outside the city, the largest travel time differentials are in Rockland County, NY and Bergen County, NJ, which also have the largest number of auto commuters.



Travel Time Differential (Auto versus Transit)

Difference in average travel time to work in CBD, auto versus transit.
NA=fewer than 600 total CBD workers.

Source: 2000 Census.

Auto Use Increases As Travel Time Differentials Rise

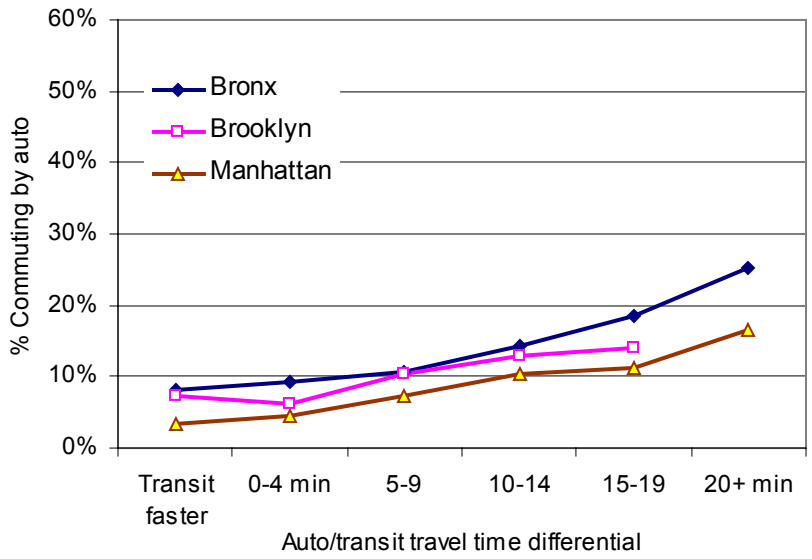
Auto mode share is very low where travel times are competitive, but higher where auto commuting is faster compared with transit.

In the Bronx, Brooklyn and Manhattan:

- Among commuters with comparable auto and transit travel times, less than 10% commute by car.
- Auto share surpasses 15% when the travel time differential is above 15 or 20 minutes.

Auto shares of below 10% when travel times are comparable suggest that relatively few NYC residents "must" drive to work -- otherwise, the auto share would be higher regardless of transit travel times.

The next page shows results for several other boroughs and counties.

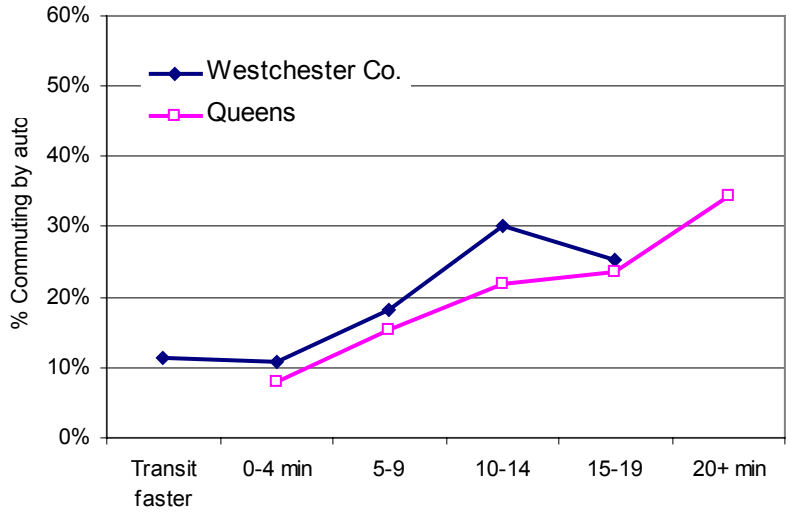


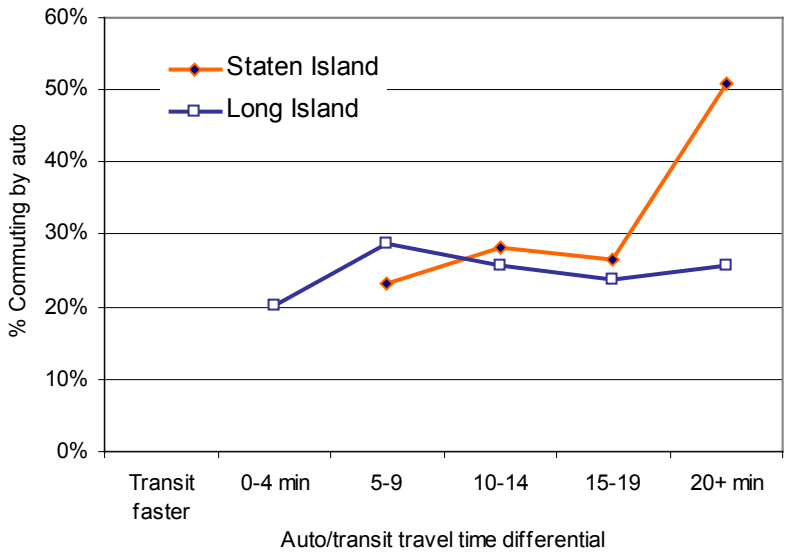
Auto/Transit Travel Time Differential and Auto Mode Share

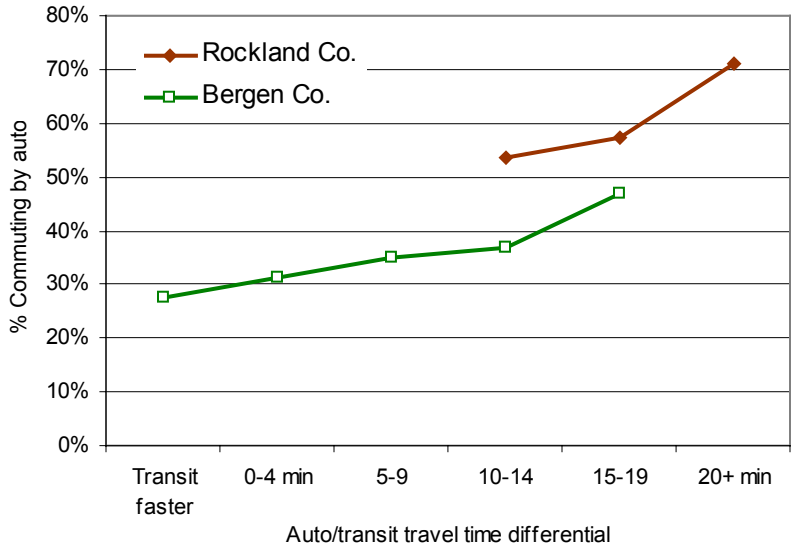
Auto and transit travel time are based on self-reported travel times from zones in each borough to zones in Manhattan. The auto/transit travel time differential is computed as the difference between the average auto commute time and the average transit commute time, for each residence/work zone pair.

Source: 2000 Census.

Auto Use and Travel Time Differentials







Auto/Transit Travel Time Differential and Auto Mode Share

Source: 2000 Census.

Travel Time Differentials -- Conclusion

The analysis shows that given transit service that offers competitive travel times, relatively few people drive to CBD jobs.

- Where there is little or no travel time differential, the auto share is :
  - 3-5% in Manhattan
  - 7-10% in Brooklyn, Queens and Hudson County, N.J.
  - 10-20% in Nassau County, Westchester County and most of New Jersey. (Also true for Connecticut).
- Auto use rises as transit commutes grow progessively longer in duration than a comparable auto trip.
  - Where the differential is over 20 minutes, 2 to 3 times more people use auto than when the travel time differential is under 10 minutes.

Lessons From London

Congestion Charging in London

In February 2003, the City of London instituted a congestion charging scheme for central London. The four primary objectives of the scheme were to:

- Reduce congestion;
- Improve bus services;
- Improve journey time reliability for car users;
- Make the distribution of goods and services more efficient.

London's experience is especially pertinent to New York because of the similarity of the two cities.

- Geographic area: Central London is 8 sq. miles compared with 9 sq. miles in the Manhattan CBD (Battery to 59 St).
- Vehicle entries: about one-half million vehicles entered each CBD on an average weekday (prior to 2003).
- High use of transit: Over 80% of persons entering the CBD use transit.
- Car ownership in CBD: CBD residents own similar number of vehicles (70,000 in London and 60,000 in NYC) even though CBD populations are quite different (136,000 people live in the London CBD versus 560,000 in New York).

The City of London has published annual evaluations of the charging program. The most recent report, released in April 2005, found that congestion charging has met its traffic and transport objectives and operates satisfactorily. This section summarizes London's experience with congestion pricing and lessons that are of interest from a New York City perspective.

How London's Congestion Pricing Works

- £5 ($8.70) charge for vehicles traveling in Central London from 7 a.m. to 6:30 p.m., weekdays. The charge was increased £8 ($13.90) in July 2005.
- Residents of the zone receive a 90% discount.
- Buses are exempt, as are motorcycles, taxis, vehicles used by disabled persons, some alternative fuel vehicles and emergency vehicles.
- Motorists must pay by 10 p.m. Payments are made at retail outlets, on-street payment machines, the Internet and cell phone messaging. Although over 80% of payments are one-day payments, motorists can also purchase one-day, weekly, monthly and annual passes.
- A network of cameras records license plate numbers of vehicles and matches plate numbers with the paid list. Owners of vehicles not paying are sent a payment notice. Fines increase if not paid quickly.
- Compliance is high: 95% pay the charge by 10 p.m. The payment rate on compliance notices is 75%. The number of appeals of the charge has fallen to fewer than 1,000 per month.
- £97 milllion ($170 million) in net annual revenues is largely spent on improved bus services.
- Number of buses generally increased by 10-20%, although the number increased by 60-80% at key locations in the AM peak.

Effects on traffic and transit

The number of vehicles in Central London fell sharply:

- 31% reduction from 2002 (pre-charge) to 2004 for vehicles that are subject to the charge.
- 17% reduction in total number of vehicles (including those not subject to the charge).

Use of buses, taxis and bicycles increased:

- 32% increase in bicycles.
- 26% increase in buses.
- 15% increase in taxis.

There was a small net increase in Inner Ring Road traffic, just outside the charging zone.

Effects on Travel Behavior

Most former drivers switched to transit:

- 60-70% of former motorists switched to another mode, primarily transit, for their trip into the CBD.

Divert around the charging zone:

- 20-25% diverted to other routes rather than pass through central London.

Very small decline in number of people coming to central London:

- Only 2% decline in the number of people terminating trips in central London.

Effects on Business

Very marginal effect overall:

- “Broadly neutral on overall business performance in the charging zone,” according to the April 2005 evaluation report.
- No significant impacts on commercial or residential property markets.
- No measurable effect on total central London retail sales, although some retailers believe that the charge has reduced their sales volumes.
- No impact on theatre attendance.
- 56% of central London businesses surveyed in 2004 view costs as having increased compared with 33% saying costs had not increased.
- However, businesses surveyed attribute changes in business sales (whether positive or negative) mostly to economic conditions and factors internal to the business rather than the congestion charge.

Public Perceptions

Residents, businesses and visitors perceive improvement to traffic, transport and quality of life:

- On-street interviews found that people in central London perceived improvements in walking, noise, public transport and amount of traffic.
- People who drive in the charging zone, including commuters, bus and taxi drivers and emergency services personnel, perceive that traffic and congestion in the zone has been reduced and that their journey times are now more reliable.
- The majority of Londoners surveyed said the charge is affordable.

Businesses perceive easier to move around:

- 61% of businesses surveyed in 2004 said it has become easier to move around by car or taxi, compared with 28% saying not easier.
- 25% of businesses surveyed said that traffic is “very bad” or “critical” compared with 52% prior to the charging program.

Overall, broad public support as long as bus improvements are maintained:

- 68% of London residents said they had gained overall from the congestion charge or that it had made no difference.
- Negative expectations that existed prior to implementation have not been borne out.
- 55% of businesses express support for current scheme as long as there is continued investment in public transport, compared with 24% who do not support the charging program.

Lessons for New York

London's favorable experience with congestion pricing demonstrates that limiting auto usage (in London's case, through pricing) can improve transport and the quality of life in the CBD. Congestion has been reduced and Londoners perceive that it has become easier to move around in the CBD. Likewise, people in the CBD perceive improvements in the street environment -- walking, noise, public transport and amount of traffic. The charge is viewed as affordable. There has been little reduction in the number of people coming to central London.

The London experience also shows that despite initial skepticism the public can be won over by restrictions on auto use, perceiving that the benefits outweigh the costs.

Other key aspects of the London experience for New York are:

- Critical importance of improving surface transit services to provide an alternative to the personal automobile and to accommodate increases in transit ridership.
- Practicality of an ambitious charging program, in London's case using license plate cameras and offering several payment channels.
- Importance of major public information program when changes are implemented.
- Neutral impact on businesses, reflecting the fact that the number of people destined for central London was scarcely affected by the congestion charge.

Section V.

CONCLUSIONS AND IMPLICATIONS FOR TRANSPORTATION POLICY

Conclusions

The central conclusion of this study is:

Most people who drive in the Manhattan CBD do so as a matter of choice, not necessity.

Auto users choose to drive because, for them, driving is better than walking, bicycling, hailing a cab or taking transit. The choice of auto is motivated by the comfort and convenience of driving, speed of travel, availability of parking or a combination of these and other factors.

Very few people who drive in the Manhattan CBD lack an alternative mode. The region's extensive transit system is capable of serving most CBD auto trips -- and in fact serves most of the trip origin and destination combinations of trips made by auto.

Thus, steps that might discourage or impinge on auto use do not prevent people from going about their professional and personal lives in Manhattan. Since auto users have alternatives, if the cost increases or the convenience or speed of auto travel decreases, auto users are likely to switch modes, not switch destinations. London's experience with congestion pricing is concrete evidence that even with a substantial charge for CBD driving, very few people stop coming to the CBD.

Implications for Transportation Policy

What are the implications of these findings for transportation policy in New York City? Three major policy implications are evident.

1. Since driving is a matter of choice and not necessity for most auto users, providing space for auto users should be viewed as a policy choice, not as an economic imperative.

The valuable public space allocated to the personal auto has many productive uses for pedestrians, bicyclists, buses, taxis, trucks and commercial vehicles. The alternative users are generally more efficient and less polluting. Thus, decisions to allocate space to autos instead of other potential users should only be made when the auto is a higher and better use -- more efficiently contributing to the mobility of persons and goods in Manhattan, to the economy of the city and to the street environment. Streets and avenues should not be viewed as, by default, belonging to cars.

Implications for Transportation Policy (cont.)

2. Reducing auto use should involve both providing more space for walking, biking and transit -- modes that use scarce public space more efficiently than the personal auto -- and improvements to non-auto modes.

This report highlights the powerful effect of commute times by auto relative to transit commutes. Every minute matters: when people can save time by driving, more people do so. As London also found, making a major change to reduce auto use in the CBD requires substantial expansion of transit services.

London increased bus services in the CBD. New York might look more to a combination of bus and rail improvements. Promising areas to examine include providing better access to existing rail services via feeder buses, expanding rail station parking and adding express bus service into the CBD from areas that lack rail service. Major projects such as the Second Avenue subway and East Side Access would speed transit trips from the upper east side and Long Island, greatly reducing transit travel times from those areas.

Implications for Transportation Policy (cont.)

3. Reducing auto use into Manhattan requires addressing the lack of viable alternate routes for through drivers.

With one-third or more drivers who enter the CBD traveling to non-CBD destinations, through traffic is clearly a problem. Unfortunately, Manhattan lacks the ring roads of London or other European cities. Providing better transit options for through drivers -- such as between the Meadowlands/Secaucus area and both eastern Queens and southern Brooklyn -- would be a step toward addressing the problem of through traffic.