

3.0 PROJECTED CHANGES AND TRANSPORTATION IMPLICATIONS

Over the past two decades, Downtown Brooklyn has enjoyed a revitalization that has brought economic growth to this area of dense, diverse urban neighborhoods. Recent zoning changes, combined with a desirable location and excellent transportation access, has the greater Downtown Brooklyn area positioned for unprecedented growth. Increased development is expected in many sectors, including office, retail, academic/institutional, residential and recreational (see Figure 13).

3.1 Office Growth

Downtown Brooklyn commercial office area, equal in size to the downtowns of Atlanta and St. Louis, is poised to attract more jobs, while preserving its tax base and generating new revenues. The zoning changes in the recently approved *Downtown Brooklyn Development Plan* is expected to lead to the development of an additional 4.5 million square feet of Class A office space by 2013, primarily concentrated adjacent to, and just south of the existing MetroTech center. An additional 2 million square feet of office space related to the rezoning can be expected to be developed between 2013 and 2025. In the Atlantic Terminal/Atlantic Yards Area, an 875,000 square foot office tower would anchor the Atlantic Yards project. In total, nearly 11 million square feet of office space would be added in the next 20 to 25 years. Combined with projects recently completed or pending completion, this would equate to double the amount of office space that existed in 2003, adding about 35,000 jobs to the downtown core.

3.2 Retail Growth

Over the next 20 years, significant retail growth is expected to occur within, and adjacent to the Study Area. This includes both destination (regional) retail as well as neighborhood retail potentially totaling over 3 million square feet. Within the core Downtown Brooklyn area, the *Downtown Brooklyn Development Plan* would allow for the creation of approximately 1 million square feet of retail space on the ground floor of commercial and residential buildings. Other significant retail developments within the Study Area are expected to include the increasing occupancy of the Atlantic Terminal Mall and expansion of The Gallery at Fulton Mall. The proposed Atlantic Yards project includes roughly 300,000 square feet of neighboring serving retail.

Though outside the area, the most significant retail development from a transportation perspective will be the recently approved 346,000 square foot IKEA in Red Hook which is expected to be opened in 2006.

3.3 Residential

The market for housing, and in turn the pace of new residential development and conversion in and around Downtown Brooklyn, are on the rise. The most significant change in the future is the growth of housing in the core downtown area which has traditionally been a primarily commercial area. This change will come via a number of projects and plans, including:



- Legend**
- Area Development
 - 1 - Downtown Brooklyn Development
 - 2 - Brooklyn Bridge Park
 - 3 - BAM Cultural District
 - 4 - Atlantic Center
 - 5 - Atlantic Yards/Brooklyn Arena
 - 11 - Brooklyn Navy Yard
 - Point Development
 - 6 - Completion of Phase 1 Metrotech
 - 7 - Redevelopment of Municipal Garage
 - 8 - Brooklyn Law School Housing
 - 9 - Hoyt-Schermerhorn Development
 - 10 - Atlantic Avenue LDC
 - 12 - Pier 12 Cruise Ship Terminal
 - 13 - Navy Brig to Terminal
 - 23 - IKEA Red Hook

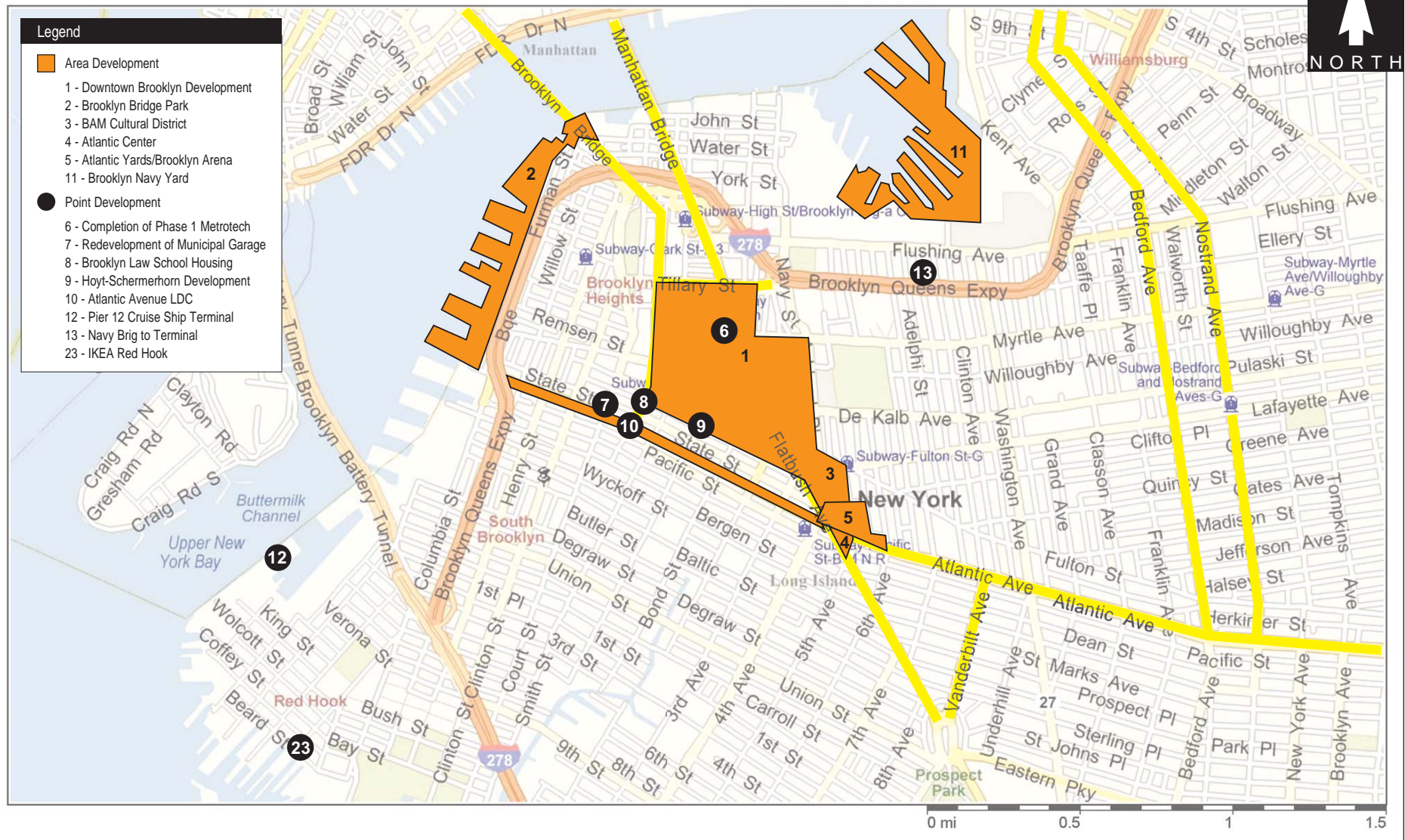


Figure 13 - Existing and Proposed Development Projects
Downtown Brooklyn Transportation Blueprint

- Up to 375 units at the former Board of Education building at 100 Livingston Street.
- Greater than 500 units developed in the Hoyt-Schermerhorn lots.
- Around 1,000 units in the next 10 years in the core made possible by the rezoning of downtown, plus nearly 3,000 additional units in the subsequent 10-15 years.

Near the core, the most significant development would be the more than 5,000 housing units developed as part of the Atlantic Yards project. The plan for Brooklyn Bridge Park is expected to yield 700 units plus an estimated 500 units relate to the redevelopment of 360 Furman Street. In the DUMBO area, 10 new developments are expected to be built or converted by 2006, quadrupling the number of units. Additionally, residential development from Williamsburg to Park Slope will increase the number of residents a short distance from downtown.

3.4 Recreational and Cultural

Four major projects/plans are expected to significantly expand recreational and cultural activities in the greater downtown area.

- At the edge of the core where Flatbush and Atlantic Avenues intersect, a 20,000 seat, 800,000 square foot arena is proposed as the home of the National Baseball Association franchise New Jersey Nets. It would also host a myriad of other events.
- Brooklyn Bridge Park is to provide over 70 acres of open space along the waterfront stretching over a mile from Atlantic Avenue to past the Manhattan Bridge.
- The BAM Cultural District is poised to expand with a number of projects, the first of which will be a 140,000 square foot visual and performing arts library and a new 40,000 square foot theater at Flatbush and Lafayette Avenues.
- A cruise terminal at Pier 12 in Red Hook, just outside the study area will begin receiving ships in the fall of 2005 with major activity increasing in 2006 when the terminal receives the Queen Mary 2, Queen Elizabeth 2, Crown Princess and Star Princess.

3.5 Academic and Institutional

Downtown Brooklyn's role as a major academic center is expected to grow over the coming years. The zoning changes in the Downtown Brooklyn Development Plan would allow the NYC College of Technology and Polytechnic University to expand their academic facilities by over a million square feet aided by the development of revenue-producing office buildings. In addition, an expansion of the Brooklyn Law School, in conjunction with an office development, is expected to exceed 100,000 square feet.

New facilities opening or recently opened will solidify downtown's role as a center of government activities including the court related facilities at 330 Jay Street (local) and Tillary Street (federal).

However, future development is focused on growing private clients, thus the proportional representation of government entities is expected to decline.

3.6 Transportation Implications of Future Developments

Future development in and around the Study Area would have effects on all modes of travel, vehicular and non-motorized. In addition, there will be daily, seasonal and temporal variations in travel patterns associated with various land uses. For example, the large amount of office development will be expected to have significant implications for inbound travel into Downtown Brooklyn during the weekday morning peak period and a reverse peaking in the outbound direction during the evening peak period. For the residential development, the patterns will be generally reversed.

Table 3.1 summarizes anticipated transportation implications associated with the various land use development in and around the Study Area. A more detailed discussion existing and anticipated transportation issues will be presented in subsequent sections of this memorandum.

Table 3.1 Major Projected Land Uses and General Transportation Implications	
LAND USES	GENERAL TRANSPORTATION IMPLICATIONS
Office	<ul style="list-style-type: none"> ▣ Increased inbound travel during the weekday AM and outbound travel during the weekday PM peak periods involving transit modes primarily and auto use secondarily.
	<ul style="list-style-type: none"> ▣ Increased demand for service and delivery vehicles resulting in added demand for curbside space.
	<ul style="list-style-type: none"> ▣ Increased pedestrian trip-making during the weekday AM, Midday and PM peak periods, AM and PM trips primarily coming between subway stations and work location.
	<ul style="list-style-type: none"> ▣ Additional parking demand from office workers commuting by car
Retail	<ul style="list-style-type: none"> ▣ Increased travel during weekday afternoon/evening and weekend peak periods.
	<ul style="list-style-type: none"> ▣ Increased pedestrian activity particular in the core where neighborhood retail is expected to expand.
	<ul style="list-style-type: none"> ▣ Increased retail-related truck and service deliveries resulting in added competition for curbside space.
	<ul style="list-style-type: none"> ▣ Increased demand for high-turnover short-term parking.
Cultural/Recreational	<ul style="list-style-type: none"> ▣ Concentrated trip-making during off-peak periods, involving both auto and transit modes, depending on the event.
	<ul style="list-style-type: none"> ▣ Opportunities for shared parking, particularly with office uses.
	<ul style="list-style-type: none"> ▣ Higher auto occupancies.
	<ul style="list-style-type: none"> ▣ Increased trip-making during weekday off-peak periods and weekends, involving all modes. Bicycle and pedestrian modes particularly generated by park development.
Residential	<ul style="list-style-type: none"> ▣ Increased outbound travel during the weekday AM and inbound travel during the weekday PM peak periods, primarily involving transit modes.
	<ul style="list-style-type: none"> ▣ Weekend trip making spread throughout the day in primarily non-auto modes.
	<ul style="list-style-type: none"> ▣ Increased demand for long-term parking.
Academic	<ul style="list-style-type: none"> ▣ Increased travel during weekday evening/late evening-night periods, involving primarily transit modes.

4.0 Existing and Anticipated Transportation Issues

The most pressing issues for Downtown Brooklyn are presented below. It is highlighted when an existing issue is likely to be exacerbated in the future as a result of both the nature and scale of planned and possible future development.

4.1 Surface Transportation

4.1.1 Recurring Traffic Congestion

An already overloaded roadway network is carrying heavy volumes of traffic to and from the Brooklyn and Manhattan Bridges, while also serving the diverse, dense districts of the downtown area. Despite transit service levels competitive with Lower Manhattan and Midtown, over one-third of workers in the downtown core arrive by automobile. If future employees in projected office developments commute by auto at rates near existing rates, existing traffic levels combined with future vehicular demand would not be accommodated on the existing roadway network.

Preference for Bridges as Vehicular Crossings Into Manhattan

Motorists preference for the bridges rather than the Brooklyn Battery Tunnel add to the congestion on the roadways in downtown as traffic to and from the BBT does not generally impact Downtown Brooklyn. As anticipated growth in the downtown core and the greater downtown area is realized, the dual role of the roadway network in serving through and local traffic will become intensified (it has been estimated that approximately 43% of the morning rush hour traffic, and 45% of the midday and evening traffic in Downtown Brooklyn is traffic bound for either the Brooklyn or Manhattan Bridges). The Downtown Brooklyn Development Plan alone is projected to add over 1,100 vehicular trips during the AM peak hour and almost 1,300 trips during the PM peak hour within 10 years, all local trips destined to the downtown area that would commingle with existing and future through traffic destined to the bridges. If existing through traffic follows current patterns of using the downtown network, these additional trips will push demand well beyond available capacity at major intersections such as Flatbush Avenue/Tillary Street, Adams Street/Tillary Street and Flatbush Avenue/Atlantic Avenue.

Limited Major Roadways

The discontinuous street in Downtown Brooklyn, created as a result of original platting, street damappings, security closures or pre-existing superblocs, results in many streets not serving a role in carrying through traffic, or effectively used for circulating local traffic. In addition, Fulton Street, one of the few east-west through streets is a bus-only street and not part of the general vehicle network. With only a few roadways available to carry significant traffic levels and a number of barriers to expanding their supply, there is little capacity to accommodate additional vehicle traffic in peak periods.

Limited Capacity in Shoulder Hours

Typically, growth in traffic volume is accommodated in shoulder hours of the peak period. However, significant capacity is not evident in Downtown Brooklyn in the shoulder periods as shown in Table 4.1. The vehicle network already experiences a relatively “flat” peaking pattern where the volumes in the shoulder hours represent between 85% and 99% of the peak one-hour volume in the peak direction and between 90% and 95% in the reverse direction.

Table 4.1: Transportation Volume in Peak Period (As Percent of Peak Hour)

Time	Peak Direction		Reverse Peak Direction	
	Vehicles	Subway	Vehicles	Subway
7-8am	100%	68%	90%	90%
8-9am	99%	100%	100%	100%
9-10am	85%	52%	91%	76%
4-5pm	97%	60%	95%	60%
5-6pm	100%	100%	100%	100%
6-7pm	98%	78%	92%	78%

Source: *Downtown Brooklyn Vehicle Crossings, 2003*
Brooklyn / Manhattan Subway Cordon, Passengers, 2001

4.1.2 Persistent Spillover

Despite recent progress in traffic volume reduction in some corridors, regional and commuter-related traffic continues to bypass the congested major arterials and opt instead for parallel roadways through residential neighborhoods. Spillover traffic is particularly problematic when incidents or high volumes impact the capacity of major travel corridors, principally the BQE.

Traffic generated by new developments would reasonably be expected to exacerbate both the recurring congestion and spillover traffic issues. In addition, since a significant amount of future development involves retail, recreational and cultural uses, traffic volumes outside the traditional commuter peaks can be expected to increase, including weekends. While major roadways tend to have more available capacity to handle growth during these periods, growth in congestion would increase the number of time periods when spillover and the attendant quality of life impacts occur.

4.1.3 Excessive Regional Traffic

The lack of a toll from Staten Island to Brooklyn on the Verrazano Narrows Bridge provides an incentive for motorists to use the Gowanus Expressway/BQE combination as a regional northbound artery rather than facilities in New Jersey. Chronic, recurring congestion on the inbound Gowanus Expressway/BQE during many hours in the day often result in diversions off the expressway system to alternate local roadways such as Third and Fourth Avenues, Hicks Street, Clinton Street and Smith Street. In addition, it has been estimated that approximately 35% of the motorists on the Gowanus Expressway bypass the Brooklyn Battery Tunnel and continue on the BQE (or local streets) to access the Brooklyn Bridge, contributing to the congestion at the gateway intersections and spillover issues discussed earlier.

4.1.4 Parking and Curbside Issues

Parking Supply vs. Demand

Since the mid-1990s, the three publicly owned parking garages representing over 1,600 parking spaces have either been demolished or privatized, ending the provision of municipal parking in downtown. In addition, a number of non-City owned parking lots have been redeveloped. Because both public garages and surface parking lots are generally priced lower than private garages, the average price of parking in downtown has increased considerably as jobs have been added to the core.

Going forward, numerous surface lots in the area are slated for either immediate or medium term development. Based on projected development, including construction of a centerpiece park with a nearly 700 space underground parking garage, the midday balance between demand and supply will change from 1,950 spaces in surplus (out of 10,800) to a deficit of 1,000 spaces. To rebalance supply and demand, parking operators are likely to increase parking rates.

While higher prices serve as a disincentive to driving in the area, this also increases the attractiveness of significantly lower priced metered parking or free parking in residential neighborhoods. Congested curb parking contributes to double parking, impacts quality of life and adds “search” traffic to downtown streets. In the future, demand for curbside parking is likely to increase as will the willingness to search for it.

Nevertheless, the range of planned land uses in Downtown Brooklyn, with varying time-of-day peaking characteristics, would present opportunities for shared parking during weekday evenings and weekends. For example, parking spaces vacated by office employees in the evenings and weekends may be utilized by patrons of recreational and cultural events during those periods.

Excessive Use of Windshield Placards for Curb Parking

Reflective of an intense concentration of government uses in the downtown area, many commuters park all day and at no charge along curbs not designated for this use. This practice inconveniences residents and businesses, reduces traffic capacity, leads to double parking, impedes pedestrian and bicycle movements, and reduces the competitiveness of transit as a choice of commute mode by virtue of providing de facto free all day parking for downtown workers. These results are seen in the ultimate mode choice of different types of workers in downtown. Various surveys have shown that approximately 12% of commercial office workers commute by auto, however, about one-third (33%) of employees of the court system downtown commute by auto.

Competition for Curbside Space

Curbside space, which is variably used for bus stops, parking, goods loading/unloading and as travel lanes for automobiles and buses, is in higher demand than in available supply. Although most future developments in Downtown Brooklyn would provide off-street loading and unloading facilities, the demand for short-term curbside pick-up and drop-off activities by autos, taxis and livery vehicles would increase the supply-demand imbalance for curbside space.

4.1.5 High Occupancy Vehicles and Buses

Since high-occupant vehicles, such as carpools, commuter vans and buses operate in mixed traffic, traffic congestion has significant adverse impacts on these modes by slowing travel speeds, reducing their competitiveness as mode choices. Longer travel times cause buses to deviate from their schedules resulting in bus bunching, longer waiting times for passengers and overcrowding on some buses. Expected increases in traffic volume and worsening of congestion on the roadways in and around Downtown Brooklyn in the future would further exacerbate these conditions. The bus system benefits from dedicated lanes on Fulton Street and Livingston Street as well as prohibition of autos on the Fulton Mall.

4.2 Rail Transit

In peak commute periods, the subway system experience congestion and crowding. This is significant because the subway system is expected to accommodate the bulk of travel demand from Downtown Brooklyn area growth. Specifically, over 6,700 trips during the weekday AM peak hour and over 8,500 trips during the weekday PM peak hour would be accommodated on the subway system as a result of the Downtown Brooklyn Development Plan alone, in the next 10 years. Other planned developments with significant office components would also add trips to the subway system, the preferred mode choice for office workers. Concerns have been expressed that future demand may eventually exceed available capacity on certain lines, despite projections that much of the new subway demand would not occur at the peak load points.

However, in comparison to the vehicle arteries in the area the subway system appears to have significant available capacity in the overall peak commute periods. This is because capacity exists in the “shoulder” periods of the peak. The shoulder refers to the hours of the peak period just outside of the peak hour. For example, where 8-9 AM is generally considered the AM peak hour, 7-8 AM and 9-10 AM are the shoulders of the peak period. Typically as capacity is used by travel growth in the peak hour, travel moves into the shoulder periods. The vehicle network is highly utilized in the shoulder hours while the subway system exhibits significant capacity in those hours as illustrated in Table 4.1 above. For example, in the PM rush, traffic volumes in the peak direction at the downtown Brooklyn crossings (Manhattan Bridge, Brooklyn Bridge and Brooklyn Battery Tunnel) between 4 PM and 5 PM are 97% of the volumes in the peak hour of 5 PM to 6 PM. By comparison, ridership between Brooklyn and Manhattan on the subway system between 4 PM and 5 PM is only 60% of the ridership in the 5 PM to 6 PM peak hour.

Factors such as the switching capacity at Franklin Avenue that constrains the ability to provide more frequent service on the 2/3 and 4/5 subway lines, also directly affect rail service into and through Downtown Brooklyn. In addition, the switching infrastructure at Bergen Street, destroyed by fire a

few years ago, precludes express service on the F (Culver) subway line on which there is a major station and transfer point at Jay Street/Borough Hall in downtown.

4.3 Pedestrians

Regardless of the line-haul transportation mode used, all trips begin and end as pedestrian trips; as such, they represent a critical transportation user group. Pedestrians compete with vehicular modes at intersections for “green time” for crossing; and facilities within the intersection, such as median refuge areas and expanded street corners through curb extensions for holding areas. Pedestrian movements on sidewalks also coincide with, and are often affected by other activities such as goods loading and unloading between the curbside and abutting businesses. The density of pedestrian activity in the core, combined with limited sidewalks space, negatively affects the quality of the pedestrian experience. In addition, orientation is difficult due to the irregular street network.

The effort to balance the competing needs between pedestrians and vehicles, such as restricting vehicle turning movements to provide conflict-free pedestrian movements or reducing the green time for vehicular movements to provide for leading pedestrian intervals, poses a critical transportation challenge in Downtown Brooklyn. On one hand is the concern about reducing much needed vehicular capacity, while on the other is the need to safely and efficiently accommodate a growing number of pedestrians, with both groups of road users competing for the same resources.

The magnitude of planned development in Downtown Brooklyn, which will generate thousands of pedestrians, many during the peak vehicular periods, will obviously heighten this challenge. Further, continuing the trend in improving safety for pedestrians in Downtown Brooklyn will undoubtedly be desirable; however this often occurs at the disbenefit of motorists.

4.4 Bicycles

While there have been several recent accomplishments to encourage and expand bicycling in Downtown Brooklyn, some gaps still remain in the bicycle network. In addition, bicycle amenities, such as indoor bicycling parking opportunities and bicycle parking facilities at major subway and bus stations are scarce.

Some gaps in the bicycle network, such as on Boerum Place between Fulton Street and Atlantic Avenue, will be addressed in future projects. However, in other cases, gaps are expected to persist due to a combination of factors such as roadway physical geometry. Due to these deficiencies, the expected increase in bicycling as a result of the planned residential and recreational uses in Downtown Brooklyn and the potential for bicycling as a more viable transportation mode may not be fully maximized. Real or perceived safety concerns on or crossing major vehicular travel corridors may also suppress cycling rates.

4.5 Waterfront Connections

Transit, pedestrian and vehicular connections to the Downtown Brooklyn waterfront are not as robust as between other districts. While this level of connectivity may be consistent with past usage of the waterfront, that pattern has been rapidly changing with major recent or planned

developments. With significant growth envisaged for DUMBO, Red Hook and the Brooklyn Bridge Park area, the weak connections will increase in significance.

4.6 Enforcement

As the levels of vehicular and non-motorized traffic volumes increase in Downtown Brooklyn, the need for enforcement of parking regulations and other traffic rules will become more even critical in order to maximize capacity, maintain and/or improve safety levels, and improve quality of life. As discussed later, the issue regarding parking enforcement being under the jurisdiction of a non-transportation related organization - the NYPD, is problematic. In addition to parking, enforcement of other elements of the transportation system, such as truck travel on non-truck routes and illegal standing at bus stops will need to be stepped up to help ensure maximum performance of the transportation system while maintaining quality of life for residents, workers, visitors and students in downtown and the study area.

4.7 Institutional

While Downtown Brooklyn is larger than many cities, such as St. Louis, it is situated within a City with numerous business districts including two larger downtowns, Midtown and Lower Manhattan. As a result, Downtown Brooklyn does not receive comparable to downtowns of similar sizes in other regions. An example is the exclusion of Downtown Brooklyn from “hub-bound” data collected annually for the Manhattan CBD south of 60th Street.

There is no single authoritative oversight of overall transportation issues and priorities in Downtown Brooklyn. Multiple agencies are responsible for operations, planning, design, construction, enforcement, and funding. For example, the New York City Department of Transportation (NYCDOT) is responsible for most of the design and operations of the City’s streets. However, enforcement of traffic rules fall under the jurisdiction of the New York City Police Department, an organization whose mission is not centered on transportation. The separated responsibility for transit planning and operations to the Metropolitan Transportation Authority and street operation to NYCDOT also presents challenges in Downtown Brooklyn where transportation modes are interdependent and should operate as a seamless, integrated system.

5.0 Downtown Brooklyn Transportation Goals

Based on the existing and anticipated transportation issues facing Downtown Brooklyn, a set of six broad goals were developed. The following goals are intended to provide broad outcomes which agencies, policymakers and other stakeholders that impact transportation should work to affect. In future tasks, measurable objectives will be developed based upon these goals.

Goal 1: Travel Demand Growth

Accommodate the travel demand growth that comes with development. Future travel demand is expected to involve a variety of land uses and would affect all current modes. In addition, varying travel demand characteristics such as mode choice, differential peaking patterns and location of major travel generators will all influence how future travel is accommodated.

Goal 2: Managing Congestion

Manage congestion in a way that preserves and enhances quality of life and network integrity. This will include addressing existing and potential increases in spillover of through traffic onto living streets; accommodating congestion outside of traditional peak periods; and enhancing mobility for high-occupant vehicles.

Goal 3: Through versus Local Travel

Respond to changes in the balance of demand for travel through Downtown Brooklyn with travel to, from and in the area. As downtown grows as a destination the primary opportunity in this regard is to increase the relative use of the Brooklyn Battery Tunnel for through vehicle travel which does not require use of downtown's local traffic network.

Goal 4: Physical/Fiscal Constraints

Develop an effective response that recognizes physical space limitations and generally scarce funds. This includes prioritizing the most efficient transportation modes and prioritizing transportation initiatives based on benefit, costs and stakeholder acceptance. Ultimately, the goal is an appropriate mix of capital investment in new infrastructure, system management improvements, and demand management measures.

Goal 5: Street Management and Safety

Continue to improve safety and effectively manage the public right-of-way (streets, sidewalks, intersections). Competition for street right of way involving a variety of modes (vehicles, pedestrians and bicycles) and uses (parking, loading/unloading, bus stops) are expected to increase as growth occurs. Mobility requirements must be balanced by the need to extend recent progress made in improving safety for vehicles as well as pedestrians.

Goal 6: Institutional

Overcome institutional (interagency, interdepartmental, etc.) challenges to effective responses. Despite being larger than many cities, Downtown Brooklyn does not benefit from comparable policy and planning initiatives for the funding and oversight of multi-modal transportation programs, operations, planning and enforcement. This is critical if transportation in Downtown Brooklyn is to be provided in a coordinated, integrated and seamless manner.



ENGINEERS • ARCHITECTS • PLANNERS

HEADQUARTERS

71 WEST 23RD STREET
NEW YORK, NY 10010
212.366.6200
FAX 212.366.6214

OFFICES ALSO IN

GLEN COVE, NY
MONTVILLE, NJ
NEW HAVEN, CT
GLENDALE, CA
OAKLAND, CA
HOLYOKE, MA
SCRANTON, PA

www.urbitran.com

