

7. ACTION PROGRAM

This section outlines a comprehensive strategy for calming traffic in the study area, based on actions that were developed with the community to implement the area-wide strategy described above. *Section 7.1* introduces seven themes that underlie the strategy; *Section 7.2* describes the action plans for each corridor that form the bulk of the strategy. The drawings that accompany each corridor's strategy show the options for which the community showed preference during the extensive Open House and Community Board consultation in 2001 and 2002. Definitions and explanations of all traffic calming measures proposed in this section can be found in *Figure 4.1*.

In developing the action plan, the project team, community, and elected officials reached a consensus that development of plans for a number of areas should be deferred to separate investigation. These areas are noted in *Section 7.2*. *Section 7.4* outlines a staging plan and provides an estimate of broad costs for each implementation stage. Finally, *Section 7.5* reviews some of the ideas considered but rejected for inclusion in the final strategy.

While this document outlines a comprehensive strategy, specific actions can not be implemented without the level of detailed, site-specific investigation undertaken in the Pilot Program phase. Thus, all changes to the physical layout of roadways are subject to approval and revision by NYCDOT's Highway Design section, and all changes to signal timings are subject to warrant studies by NYCDOT's Signal Timing section.

7.1 Traffic Management Themes

Seven themes underlie the traffic calming strategy for Downtown Brooklyn. These themes, and the appropriate traffic calming tools to address them, are introduced briefly below. Each of these themes was considered in the development of the traffic calming action plan for each corridor. Note that these are not site-specific recommendations, but rather generic actions available to planners in the development of the areawide traffic calming strategy.

7.1.1 Pedestrian circulation and connectivity

Because Brooklyn's surface streets carry large volumes of vehicles, some high-traffic streets are difficult for pedestrians to cross during peak hours and logical pedestrian desire lines go unserved. Strategy recommendations that address pedestrian connectivity issues include:

- **neckdowns** and **medians** to shorten crossing distances,
- signalized **mid-block crossings** to introduce connections on long blocks, and
- **leading pedestrian intervals (LPI)**, **all-pedestrian phases (APP)**, and **turn restrictions** to build pedestrian confidence and visibility at key intersections.

7.1.2 Improving transit operations

Although eighteen New York City Transit bus routes serve Downtown Brooklyn, roadway congestion slows bus speeds, causes bus bunching, and hinders the ability of buses to merge back into traffic after stopping. Illegal parking and standing in bus stops create difficulties for bus drivers and for boarding and exiting passengers. Strategy recommendations that address transit operations issues include:

- **bus bulbs** to simplify bus maneuvers and improve the bus-to-sidewalk interface, and
- improved **subway/sidewalk** passenger connection.

7.1.3 Developing the bicycle network

Although many neighborhoods in Downtown Brooklyn have dedicated bicycle lanes, critical gaps still exist in the area-wide cycling network. Strategy recommendations that address bicycle network issues include:

- **new bike lanes** to give cyclists safe, dedicated routes to ride,
- **neckdowns, gateways,** and other measures aimed at slowing traffic, and
- **enhanced bike lanes** to clearly delineate routes

Since the Downtown Brooklyn Traffic Calming Project began, NYCDOT has developed a policy regarding using high-visibility treatments to enhance bicycle lanes. Lanes adjacent to the curb will receive priority for high-visibility bicycle treatments; this will clearly indicate that the lane is designated for movement of bicycles and should not be blocked by parked vehicles. This is a higher priority than “non-curbside” lanes because violations by parked vehicles in curbside lanes result in blockage of cyclists’ movement. The Department’s goal is to implement bicycle lanes identified in this report and the New York City Bicycle Master Plan in as expeditious a manner as possible. Therefore, “non-curbside” lanes will be implemented using standard treatments.

7.1.4 Truck access and routing

While trucks are blamed for many traffic problems in Downtown Brooklyn, they are the primary mode of freight access in the City. Maintaining a clear and logical truck network is critical to the local economy. Strategy recommendations that mitigate truck impacts while maintaining truck access to Downtown Brooklyn include:

- **neckdowns and gateways** to keep trucks off Living Streets, and
- **improved street management** to improve conditions for trucks on Travel and Community Streets.

7.1.5 Managing through traffic

The concept of a Street Management Framework argues that Travel Streets are the appropriate places to accommodate through traffic in Downtown Brooklyn. At the same time, through traffic should be discouraged from using Community and Living Streets, and its impacts should be mitigated on all streets. Strategy recommendations that address through traffic issues include:

- **neckdowns, gateways, raised intersections**, and other measures to discourage through traffic from using Living and Community Streets and to reclaim street space for pedestrians,
- **improved signal progressions** on Travel Streets to create “green waves” that allow for appropriate free-flow travel speeds, and
- **channelization** of intersections with high pedestrian volumes to delineate vehicle and pedestrian space.

7.1.6 Local traffic permeability

While many traffic calming measures aim to reduce vehicular impacts and keep regional traffic off Living and Community Streets, it is important that the street grid remain permeable to appropriate volumes of local traffic. Strategy recommendations that aim to preserve local permeability include:

- **raised intersections and crosswalks,** and **slow signal progressions** that slow but do not block traffic,

- **gateways**, and **neckdowns** that discourage but do not prevent traffic from entering Living Streets.

7.1.7 Emergency vehicle access

Traffic calming projects are sometimes criticized for decreasing access and slowing response times for emergency vehicles. In the Downtown Brooklyn Traffic Calming project, every recommendation that changes street geometry was tested to ensure that turning fire engines and other large emergency vehicles were able to negotiate the new street alignments safely. Every recommendation that alters the normal flow of traffic was tested to make sure emergency vehicles can still permeate the entire street grid easily. Strategy recommendations that required this testing included:

- **neckdowns, raised intersections, and gateway treatments**: tested for safe vehicle movements
- **partial diverters** and **street direction changes**: tested for continued network permeability

Figure 7.1 Testing the Hicks Street neckdown for FDNY turning radius



7.2 Action Plans

Coordinated action plans have been developed for all streets in the study area on a corridor-by-corridor basis. These action plans are consistent with the street management framework described in *Section 5.2*, the traffic management themes and tools described in *Section 7.1*, and the overall street management strategy described throughout this document. The plans also address the issues and ideas that arose throughout the community outreach process⁹. Community Boards that were directly affected reviewed early drafts of each action plan, and engaged the project team in a

⁹ A comprehensive list of ideas raised by the community at the outset of the process can be found in *Appendix A3: Idea Development*. A comprehensive list of public comments suggesting and reacting to the action plans can be found in *Appendix D: Public Comments Received*

detailed discussion of their own ideas for improving the plans. These discussions led to a final action plan for each corridor, with the reviewing Community Board's endorsement. In each case, the full Community Board adopted the endorsement of the Community Board's designated review committee (the Transportation Subcommittee in the case of Community Board 6 and a specially constituted review panel in the case of Community Board 2).

The action plans reflect the objectives for each street, based on the agreed street designation.

7.2.1 Travel Streets

Plans for Travel Streets were developed based on the functions of streets discussed in the Street Management Framework in *Section 5.3.1*. The overall objectives for Travel Streets are to:

- Alleviate traffic bottlenecks with traffic management strategies,
- Facilitate pedestrian and bicycle movement,
- Improve the street environment for pedestrians, bicyclists, businesses and residents,
- Discourage excessive speeds and aggressive driving,
- Improve access to businesses and institutions, and
- Reduce the degree to which Travel Streets are barriers between neighborhoods.

7.2.1.1 3rd Avenue

3rd Avenue is an important north-south link in the eastern part of Downtown Brooklyn. Though it does not carry substantial traffic (it carries approximately 9,700 vehicles per day in the peak northbound direction), it acts as a relief route when congestion occurs on 4th Avenue. In 1980, NYCDOT installed a bicycle lane on 3rd Avenue along the southbound roadway between Union and 3rd Streets. The treatment includes a buffer between the bicycle lane and the travel lane in the segment from Carroll to 3rd Streets. The strategy for this street recognizes the need to maintain smooth flow on 3rd Avenue while reclaiming unused space for other users – in this case, cyclists.

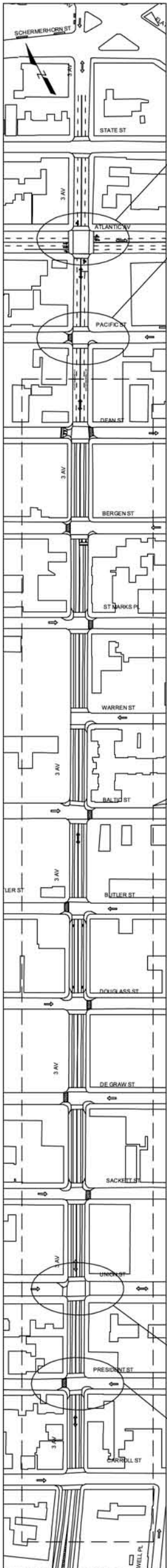
Suggestions include striping northbound and southbound Class II bike lanes from 9th Street to Dean Street, providing a flat, moderate-traffic link for north- and southbound cyclists. From Dean to Carroll Streets, the cross-section would consist of a parking, cycling, and travel lane on either side of the centerline. The cycling lane would replace an existing travel lane south of Dean Street, where volumes on 3rd Avenue are under capacity and there is little turning movement. The cycling lane is not recommended north of Dean Street, where the second northbound travel lane is needed to store traffic approaching Atlantic Avenue. South of Carroll Street, 3rd Avenue widens, providing an opportunity to add a painted buffer with diagonal striping between the bike lane and travel lane. This would give cyclists an additional buffer against traffic and encourage lane discipline for motorists. Community Board 6 preferred the painted buffer to another option suggested for the segment south of Carroll Street involving a raised median, which would have slowed traffic but provided little benefit for pedestrians or cyclists.

The bike lane recommendation seeks to reclaim currently underused street space for cyclists, an approach which entails a trade-off. As noted above, 3rd Avenue has an additional role as a relief route when 4th Avenue is congested. Reducing vehicular capacity on 3rd Avenue would not compromise its normal peak hour operation, but would reduce its ability to relieve periodic congestion on 4th Avenue. This trade-off, which the project team and community judged to be worth making, should be recognized in the ongoing management of 3rd Avenue.

Gateway treatments involving neckdowns and raised, color-textured intersections are recommended at Living Streets that intersect 3rd Avenue between 9th and 15th Streets. Leading Pedestrian Intervals (LPIs) should be installed to allow pedestrians a head start across 3rd Avenue. North of Dean Street, where the bike lane ends, LPIs should be installed to improve crossing conditions at Pacific Street and Atlantic Avenue. For a detailed discussion of the issues surrounding the intersection of 3rd Avenue, Flatbush Avenue and Schermerhorn Street, see *Sections 7.2.1.9 and 7.5.2*.

As the process moves towards implementation, NYCDOT will pursue part of the bike recommendations for 3rd Avenue. In Spring 2004, the existing southbound bike lane will be extended from 3rd Street to 15th Street. This southbound bike lane will also be linked to the bicycle lane on Clinton Street to the west via 3rd Street, which will act as an “east-west” connector. After implementation of the southbound bicycle lane and an evaluation of its operations, a companion northbound lane could be considered. Also in Spring 2004, Leading Pedestrian Indicators (LPIs) will be installed at the intersections of 3rd Avenue/9th Street and 3rd Avenue/Atlantic Avenue. Other recommended treatments will require further detailed evaluation and design work and will be part of future implementation efforts.

3RD AVENUE (TRAVEL STREET) FROM STATE STREET TO CARROLL STREET



• Add LPI

• Add LPI

Start of neckdowns and gateways with raised crosswalks and textured pavement

ACTIONS SUPPORTING STRATEGY

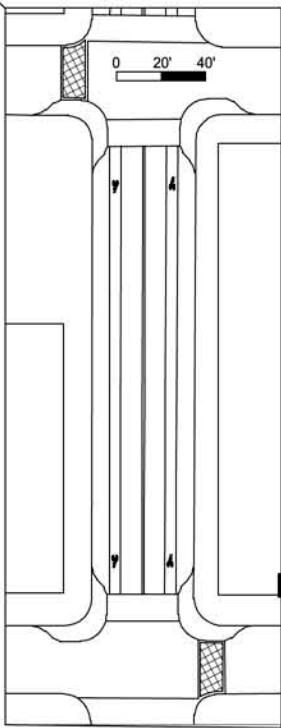
Overview of Physical Improvements

- Improve the pedestrian environment at busy intersections in the corridor by installing neckdowns to reduce the distance pedestrians must walk to cross, improve pedestrian visibility, and encourage vehicles to turn at slower speeds.
- Discourage traffic from using community streets as short cuts to neighborhoods west of 3rd Avenue by adding gateway treatments with raised crosswalks or textured pavement.
- Create an on-street bicycle lane from 9th Street to Dean Street positioned between the parking lane and the travel lane.

Overview of Operational Improvements

Provide more signal time for pedestrians at the north end of the corridor by implementing Leading Pedestrian Intervals.

PREFERRED OPTION



Pros:

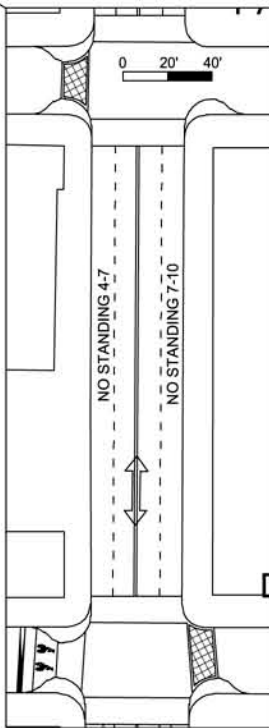
- Provide improved bicycling facilities
- Provide all-day parking

Cons:

- One travel lane will result in slight decrease in capacity
Example: Butler Street
(Before: LOS B Delay 12s)
(After: LOS B Delay 17s)

• Neckdowns and gateways
1A. 5 Ft Class II (On-street) bicycle lane

DISCARDED OPTION



Pros:

- Maintain existing capacity in the peak hour

Cons:

- Lack of bicycle facilities along this corridor

• Neckdowns and gateways
2A. Maintain peak hour lanes

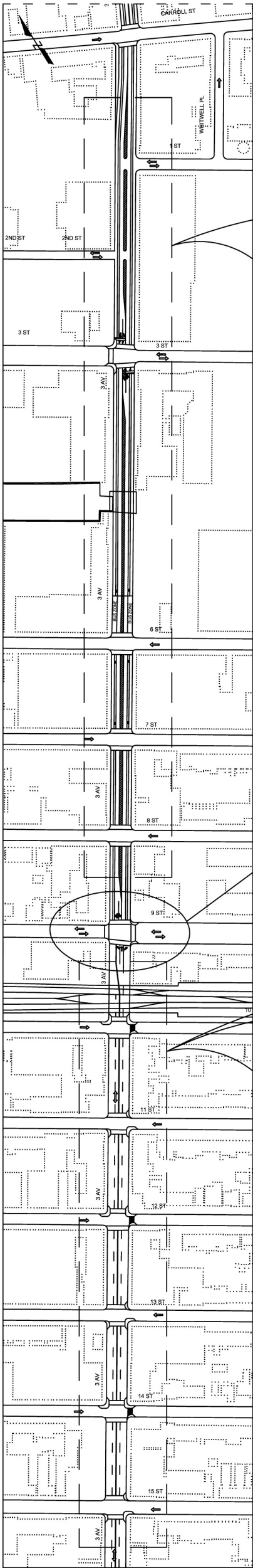
• Add an extra wide neckdown to enforce transition from two-way street to a one-way street

End neckdowns and gateway treatments with a raised crosswalk and textured pavement

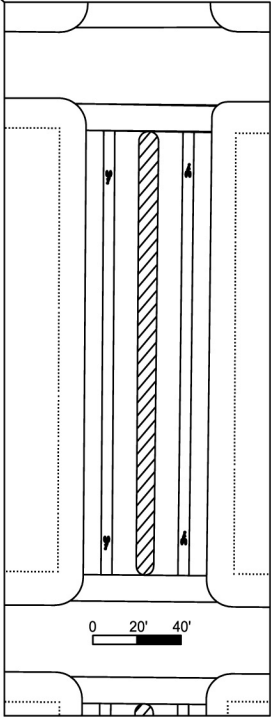


CONTINUED ON PAGE 10

3RD AVENUE (TRAVEL STREET)
FROM CARROLL STREET TO 15TH STREET



**CARROLL ST TO 9TH ST
DISCARDED OPTION:**



Pros:

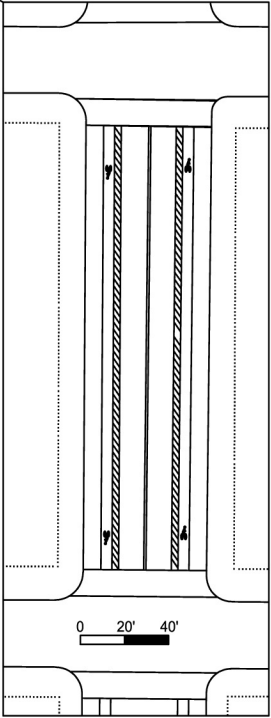
- Provides improved bicycle facilities
- Striped Island reduces ambiguous driving conditions

Cons:

- Median does not help pedestrians because it does not extend into the crosswalks

- Add a 5' Class II (on street) bicycle lane
- 1A. Add a striped median

**CARROLL ST TO 9TH ST
PREFERRED TYPICAL SECTION:**



Pros:

- Single lanes reduce ambiguous driving conditions
- Narrow roads will result in more cautious driving conditions
- Provides extra parking supply

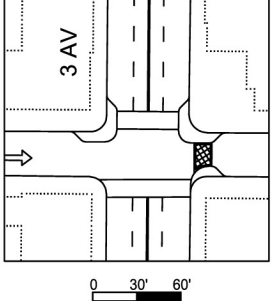
Cons:

- Extra wide bicycle area could result in illegal parking

- Add a 5' Class II (on street) bicycle lane
- 2A. Add 3' wide bicycle lane buffers

- Add left turn lanes
- Convert one northbound lane into a right-turn lane
- Restripe 3rd Ave into single travel lanes
- ↑ End of 3 Ave bicycle lane

**9TH ST TO 15 TH ST
TYPICAL INTERSECTION
DISCARDED OPTION:**



Pros:

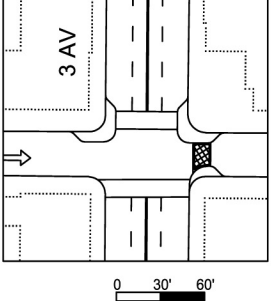
- Reclaim space for pedestrians
- Narrowed streets encourage slower speeds

Cons:

- Might reduce parking supply

- Add gateway treatments
- 1A. Add neckdowns

**9TH ST TO 15 TH ST
TYPICAL INTERSECTION
PREFERRED OPTION:**



Pros:

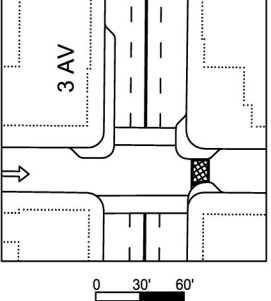
- Give E/W pedestrians a head start to cross the intersection

Cons:

- Slight reduction in capacity

- Add gateway treatments
- 2A. Add neckdowns
- 2B. Add LPI

**9TH ST TO 15 TH ST
TYPICAL INTERSECTION
DISCARDED OPTION:**



Pros:

- Added benefits for pedestrians, transit users, and bus drivers

Cons:

- Slight reduction in capacity

- Add gateway treatments
- 3A. Add bus bulbs

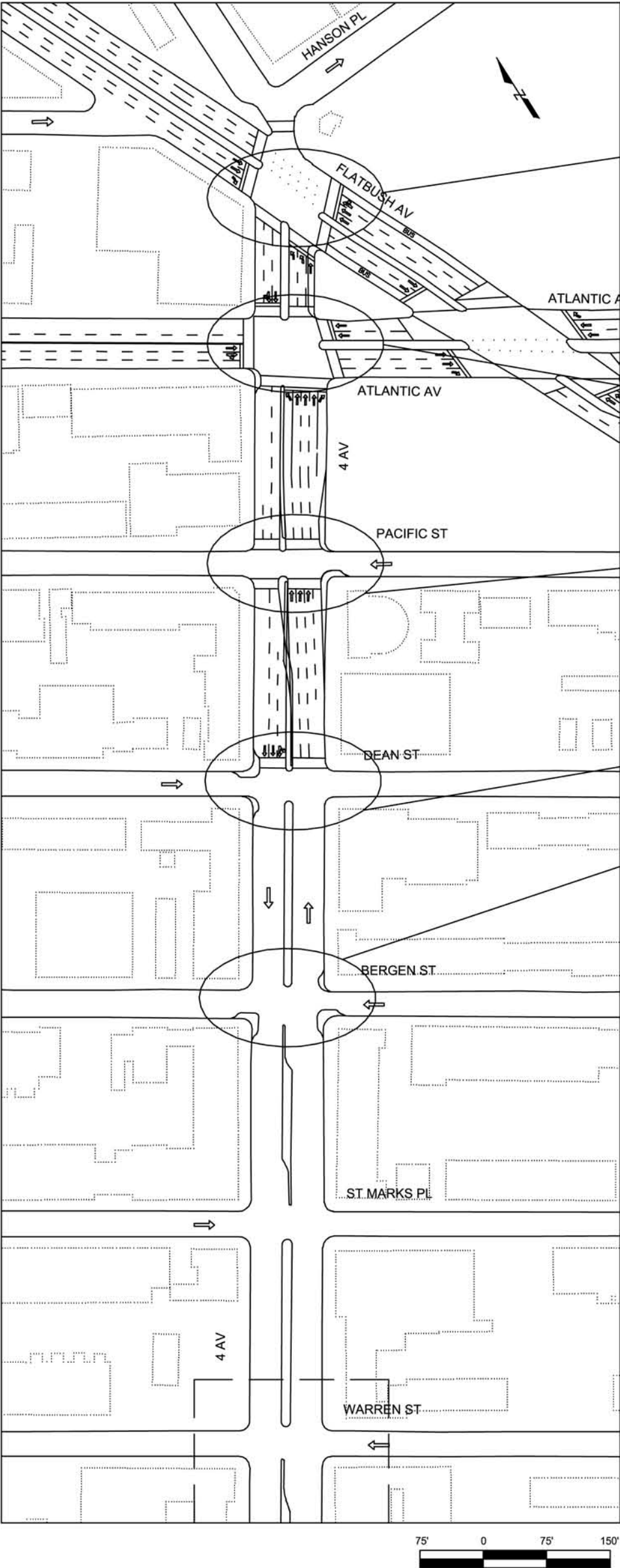


7.2.1.2 4th Avenue

4th Avenue is a major north-south artery that forms the eastern boundary of the primary study area. It carries 17,800 vehicles per day (vpd) in the peak northbound direction. Due to its width it acts as a barrier for east-west movement, particularly by pedestrians. Accordingly, the strategy for this corridor is to improve conditions for pedestrians crossing 4th Avenue without compromising its traffic-carrying capacity. This should be accomplished by reducing crossing distances and providing maximum possible crossing times for pedestrians wherever possible. In order to improve pedestrian conditions, space should also be reclaimed for pedestrian use wherever possible and particularly around the subway stations at Pacific, Union, and 9th Streets.

To the west of 4th Avenue are Living Streets on which through traffic should be minimized. Particularly at 4th Avenue's northern end, where the traffic congestion at its intersection with Atlantic and Flatbush Avenues in the morning commuter peak encourages drivers to seek alternate routes, such intrusion is a problem. A number of options for discouraging left turns by northbound drivers onto east-west Living Streets west of 4th Avenue were investigated, including removing the short left turn lanes at each intersection, which would provide greater pedestrian storage area in the middle of the road, and banning some left turns. It should be noted that the design of the 4th Avenue median is constrained to some extent by the subway that runs beneath the road and the subway vents in the median strip. In consultation with the community, it was recommended that NYCDOT investigate LPIs for pedestrians crossing 4th Avenue and continue to provide left turns off it.

4TH AVENUE (TRAVEL STREET)
FROM FLATBUSH AVE TO WARREN ST



- Improve signal co-ordination with the intersections along 4th Ave south of Flatbush Ave
- Increase length of existing APP
- Reconfigure EB approach to two through lanes and one exclusive right-turn lane
- Install medians

- Install medians
- Increase pedestrian crossing times
- Improve signal coordination along Atlantic Ave
- Add a neckdown
- Make NB 4th Ave left-turns protected

- Add neckdowns
- Add an APP
- Ban westbound left turns
- Re-align & re-stripe intersection to allow one of the through lanes to feed directly into the left turn lane at 4th Ave and Atlantic Ave

- Add neckdowns
- Add an APP

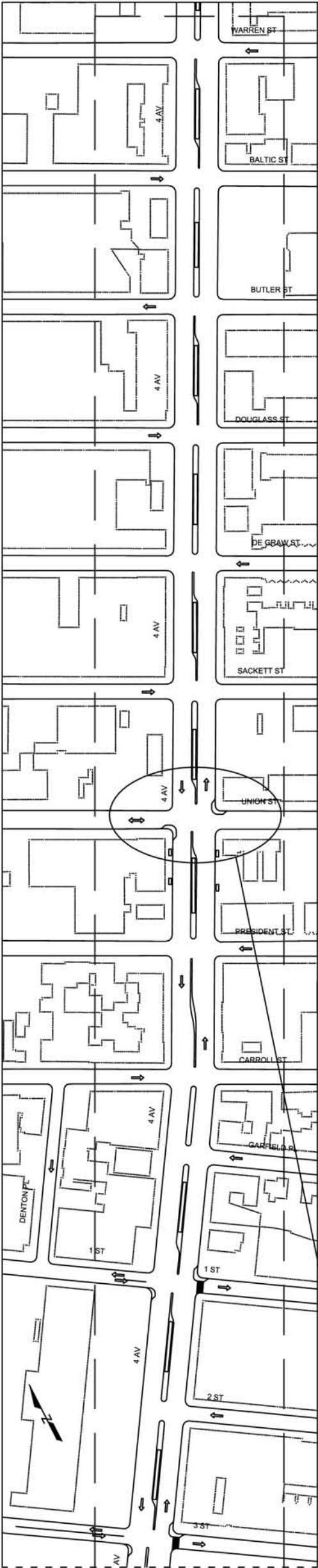
- Add neckdowns

ACTIONS SUPPORTING STRATEGY

- General Improvement Strategies**
- Reduce the distance pedestrians must walk to cross 4th Avenue.
 - Improve the pedestrian environment around subway stations in the corridor.
 - Provide more time for pedestrians to cross 4th Avenue.
 - Reclaim excess street capacity for pedestrians.
 - Maintain efficient through movement of vehicles through corridor.
 - Maintain existing signal progression on 4th Avenue from Prospect Expressway to Times Plaza.
 - Provide protected left turns onto 4th Avenue from major cross streets to reduce blocking of bus stops.
 - Manage left-turning traffic off north bound 4th Avenue to protect living streets.

4TH AVENUE (TRAVEL STREET)
FROM WARREN STREET TO 15TH STREET

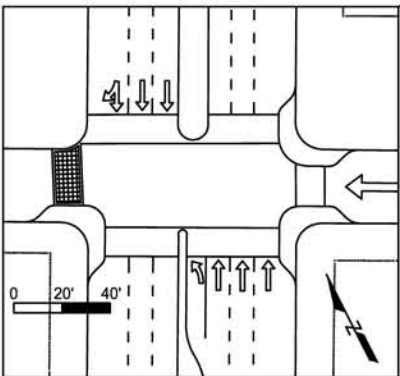
CONTINUED ON PAGE 11



CONTINUED ON TOP RIGHT

- Add a gateway treatment
- Add neckdowns
- Add LPI

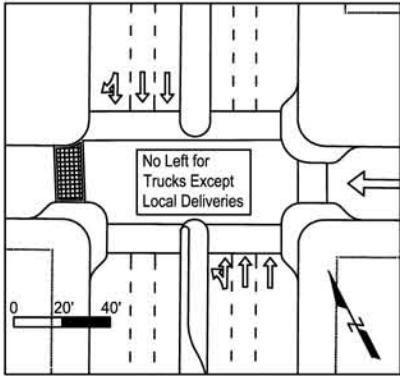
TYPICAL INTERSECTION PREFERRED OPTION:



- Pros:**
- Increase pedestrian safety
 - Reduce traffic speeds
 - Discourage cut-through traffic
- Cons:**
- Might reduce parking supply

- Add neckdowns and gateway treatments
- Add protected left turns and LPIs

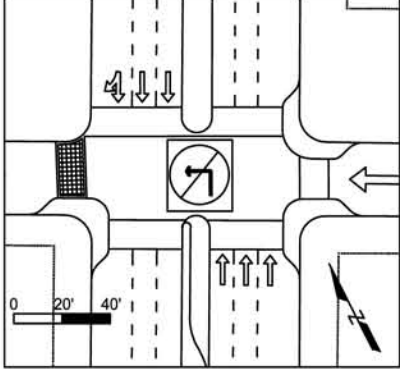
TYPICAL INTERSECTION DISCARDED OPTION:



- Pros:**
- Increase pedestrian safety
 - Reduce traffic speeds
 - Discourage cut-through traffic
 - Eliminate sub-standard turning lanes
 - Keep trucks out of living streets
- Cons:**
- Small Reduction in capacity
 - Hard to enforce through traffic ban

- Add neckdowns and gateway treatments
- 2A. Create median by eliminating left turn lane
- 2B. Restrict left turns

TYPICAL INTERSECTION DISCARDED OPTION:



- Pros:**
- Increase pedestrian safety
 - Reduce traffic speeds
 - Discourage cut-through traffic
 - Eliminate sub-standard turning lanes
 - Keep trucks out of living streets
- Cons:**
- Small reduction in capacity
 - Adds turning vehicles to larger intersections

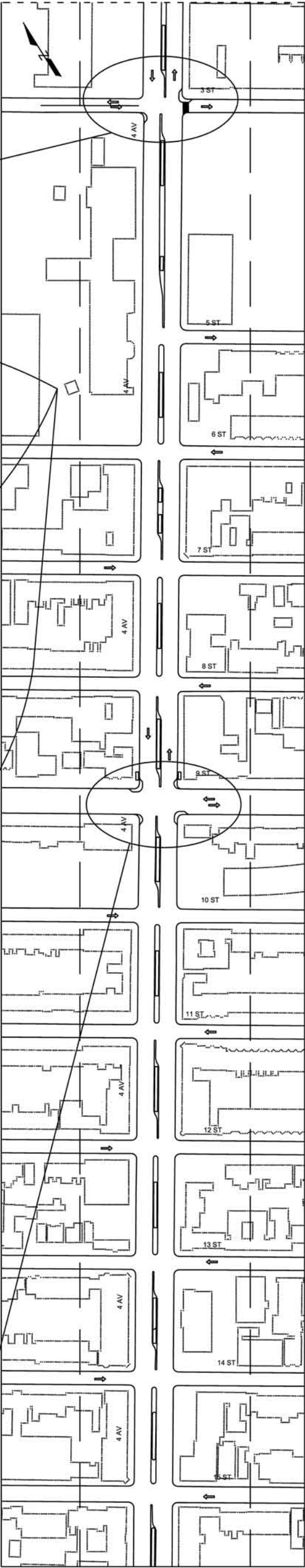
- Add neckdowns and gateway treatments
- 3A. Create median by eliminating left turn lane
- 3B. Eliminate left turns except at major intersections

NOTE: Options 2 and 3 would require further analysis to determine its feasibility

- Add neckdowns
- Add LPI

- Add neckdowns
- Add LPI

CONTINUED FROM BOTTOM LEFT



7.2.1.3 Adams Street

Adams Street is the major north-south street through the center of the study area. It links the Brooklyn Bridge with Downtown Brooklyn. North of Tillary Street, Adams Street's substantial median is an important pedestrian and bicycle link between Brooklyn and Manhattan. Barriers separate the median from the road throughout this section and these create a limited access feeling for the road, a feeling that accords with the high traffic volumes and travel speeds observed here. Moreover, this intersection has substantial impacts on local air quality problems, constraining the ability to alter its capacity significantly.

Though the community generally agreed on the objectives for the Tillary/Adams vicinity, no consensus was reached on an action plan. In particular, residents of Concord Village, who hold strong views about improvements that could be implemented in this area, remained unconvinced by the draft ideas presented for discussion by the project team. These ideas included retrieval of road space, simplification of the effort needed to cross Adams Street and improvement to its traffic operations. Although the lack of agreement on the details of a plan for this area is disappointing, it is encouraging that the idea of improving the layout and operations of this intersection has been broached. This is discussed in *Section 7.3*.

However, agreement was reached that the current configuration sends no signals to drivers entering Brooklyn that they are in a dense, mixed-use urban area and that they should drive accordingly. It was agreed that a better approach would be to force drivers to acknowledge their surroundings north of their current point of entry into the surface street system at Tillary Street. This would allow the community to reclaim some of that section of open space north of Tillary Street and provide a much needed connection between Concord Village and Cadman Plaza to the west of Adams Street. Some area residents believe that this could be accomplished by introducing a signalized pedestrian crossing north of the Tillary Street/Adams Street intersection. Community members and the project team developed alternative designs for such a crossing.

Although these plans had potential benefits, there were serious safety concerns related to the need to provide adequate stopping sight distance for southbound traffic exiting the Brooklyn Bridge between the curve at the end of the bridge and any new pedestrian crossing that might be constructed. (Stopping sight distance is the distance required for a driver to identify the need to stop, react and then to stop his or her vehicle. This is related to prevailing travel speed.) As the proposed crosswalk is north of the current crosswalk, the amount of space between the bridge exit and the crosswalk is reduced. Therefore, when queues occur, a potentially hazardous condition may occur from the spillback approaching the curved section of roadway exiting the bridge. Additionally, any plan for a pedestrian crossing would still need to accommodate pedestrians crossing the northern leg of the intersection of Adams Street and Tillary Street, and safety and operational concerns associated with the new Federal Courthouse on the west side of Adams Street would have to be considered.

ADAMS STREET (TRAVEL STREET)

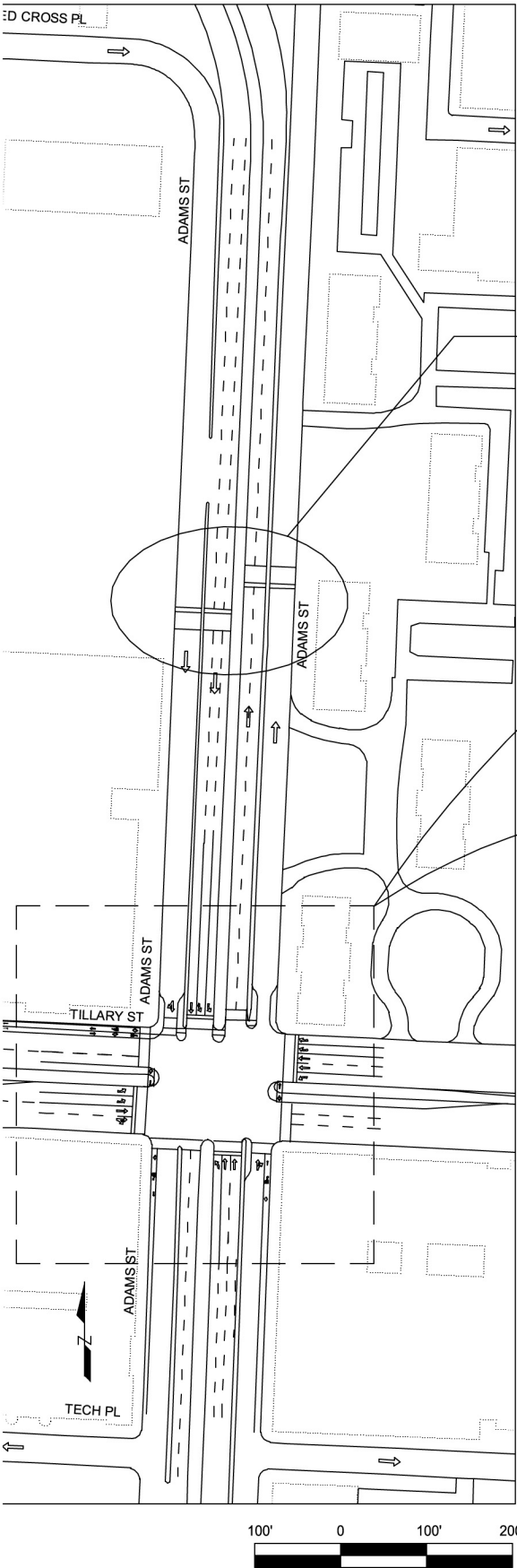
ACTIONS SUPPORTING STRATEGY

Overview of Physical Improvements

- Widen medians and reclaim road space to provide for both pedestrian and bicycle movements.

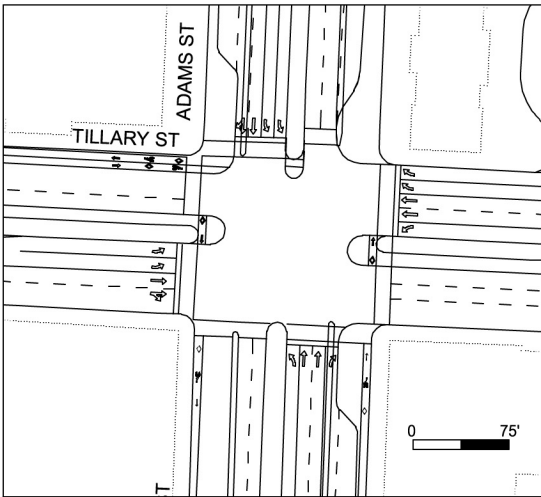
Overview of Operational Improvements

- Modify signal timing and phasing to maximize protected pedestrian phases where possible. Specific improvements include longer crossing times and protected left turn phases to further reduce vehicular conflicts.



- Add a staggered mid-block crossing
Note: This treatment would require an in depth study to determine its feasibility.

TILLARY ST/ADAMS ST DISCARDED OPTION:

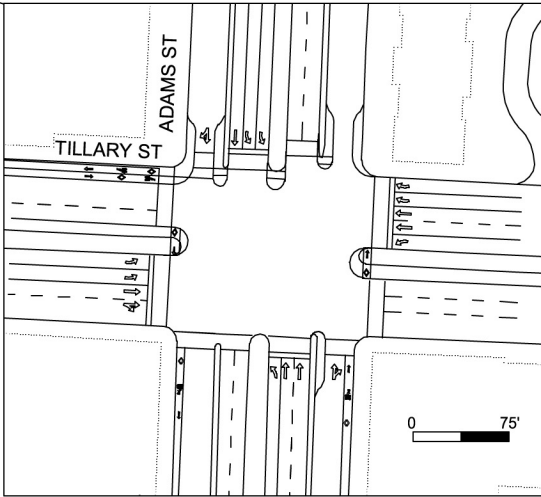


- Pros:
- Greatly reduces pedestrian crossing distance across Adams St and improves pedestrian safety
 - Creates area for landscaping and beautification
 - Improves traffic and parking discipline
 - Provides clear routes for cyclists

- Cons:
- Some loss of parking

- Widen Medians
- Revise signal timing to protect WB left-turns
 - Split pedestrian crossing on north leg
- 1A. Modify service road connections to Adams St to allow narrowing of roadway

TILLARY ST/ADAMS ST PREFERRED OPTION:



- Pros:
- Reduces crossing distance across Adar
- Cons:
- Pedestrians still have cross four roadways

- Widen medians
 - Revise signal timing to protect WB left-turns
 - Split pedestrian crossing on north leg
- 2A. Re-align service roads to allow for better crossing facilities

7.2.1.4 Atlantic Avenue

Two distinct sections characterize the portion of Atlantic Avenue that falls within the study area. The section to the west of Court Street is largely a neighborhood center and, despite its width, serves a mainly connective function, linking Brooklyn's downtown and the BQE. The section to the east of Court Street extending to 4th Avenue has a stronger retail focus with some residential and institutional uses.

Atlantic Avenue also suffers from significant traffic congestion at bottlenecks along its length, in particular the eastbound approach to 3rd Avenue and 4th Avenue in the evening commuter peak and the westbound approach to Boerum Place in the morning commuter peak. Converting this parking lane into a traffic lane in the evening peak period merely creates additional storage space for drivers waiting to get through the bottleneck at 3rd Avenue and 4th Avenue. While this limits the length of the traffic queue, it does nothing to increase the amount of traffic that can pass through the bottleneck, especially when illegally parked vehicles commonly block the peak period traffic lane. An earlier NYCDOT study supported maintaining the peak hour parking bans, and found that with less than three lanes, the road did not have adequate capacity to serve peak hour traffic and was susceptible to illegal standing that further reduced capacity. This finding received further confirmation when the traffic consultants for the Atlantic Avenue Master Plan undertook a new analysis of volume conditions in Summer 2003. Their independent data showed that peak hour volumes continue to be high necessitating that three lanes be maintained to provide adequate capacity at each intersection. On the other hand, Atlantic Avenue operated with only two eastbound lanes during the pilot program phase (Spring/Summer 2002), with no observed adverse impact on queuing at intersections west of 3rd Avenue. However, various sections of the street were under construction by DDC's water main contractor throughout the pilot phase, and so traffic was not operating normally.

Throughout its length, it is difficult for pedestrians to cross Atlantic Avenue. The focus of this plan is to make the street easier and safer to cross. This may be achieved by a variety of means: by changing signal timing to provide longer crossing times for pedestrians; by introducing LPIs (tested with success at Atlantic Avenue's intersection with Clinton Street) to give crossing pedestrians higher priority than at present; and by creating a median to break up the crossing (tested as a pilot treatment at Atlantic Avenue's intersection with Bond Street, this received mixed reviews; see *Section 6*). Priority locations for introducing LPIs to Atlantic Avenue include the intersections at 3rd Avenue, 4th Avenue, Hoyt Street, Bond Street, and Nevins Street.

Accordingly, the idea of rethinking the use of Atlantic Avenue's road space was introduced into the study and two options for Atlantic Avenue's cross section were advanced. The first was tested in the pilot program and involved reducing Atlantic Avenue eastbound to two through lanes except on the immediate approach to 3rd and 4th Avenues. At cross streets, the current third travel lane could be converted to a median island that would serve to improve pedestrian crossing opportunities as well as better define travel lanes. A turning lane would be twinned with the median island at each intersection. The two through lanes would shift along the length of Atlantic Avenue: at mid-block locations they would occupy the middle two lanes, with 24-hour parking in the adjacent curbside lane; at cross streets the travel lanes would occupy the two outer lanes to accommodate the median island and exclusive turning lane.

Transitions would be required to move through traffic from the two outer lanes to the two inner lanes. In these transition areas no parking would be possible. At the Atlantic Avenue/Bond Street pilot, the curbside space permanently lost to these transition elements was a cause of great disappointment to a number of Atlantic Avenue merchants, who had hoped that only a very short transition could be achieved with attendant minimal impact on parking. Access to convenient

parking is particularly important for many merchants in this area, as the nature of their businesses (e.g. furniture retailing) require more immediate access to parking than other businesses. This problem illustrates the inevitable conflict that occurs between the needs of the various users of a street like Atlantic Avenue. In this case, providing 24-hour a day parking and accommodating more effectively for the needs of pedestrians was achieved at the expense of a number of parking spaces on Atlantic Avenue. It should be noted that in the Atlantic Avenue/Bond Street trial additional parking spaces were created on Bond Street at no net parking loss in the area (see *Section 6.3.7.1*).

The minimum length of the transition is a safety issue that is a function of travel speeds on the street. Because the pilot program was implemented at only a single location and without supporting broad changes to the street environment, NYCDOT determined that a conservative approach should be taken to the choice of design speed and so required that the transitions be designed for the 85th percentile design speed observed on Atlantic Avenue (38 mph). In a more permanent design for the whole street, a lower design speed might be feasible as part of a strategy to drive down average speeds along Atlantic Avenue. This would allow more parking spaces to be conserved, though it would require re-evaluating current policy of engineering streets to accommodate the observed 85th percentile speed.

Elsewhere on the corridor, a number of locations would benefit from gateway treatments, since it is important to signal to drivers that when they turn off Atlantic Avenue north or south they are generally entering Living Streets. In these areas, gateways serve a number of purposes: they signal to drivers that they should turn off Atlantic Avenue carefully; they reinforce the strong pedestrian movement parallel to Atlantic Avenue; and they create additional sidewalk space in an important pedestrian corridor.

ATLANTIC AVENUE (TRAVEL STREET)
FROM FURMAN STREET TO SMITH STREET

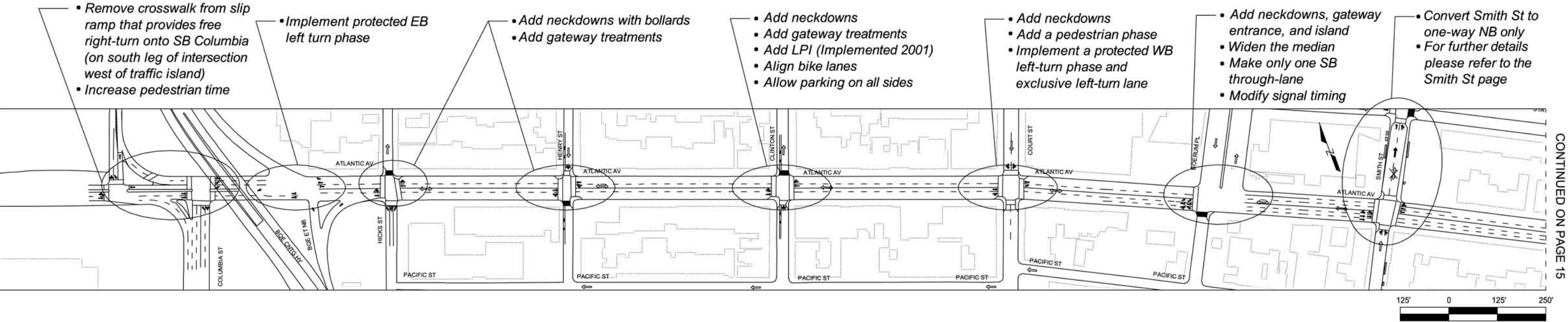
ACTIONS SUPPORTING STRATEGY

Overview of Physical Improvements

- Install neckdowns on side streets where possible to minimize crossing distances, improve pedestrian visibility, and encourage vehicles to turn at slower speeds.
- Install gateway treatments consisting of neckdowns and raised, textured crosswalks at minor side streets in the outbound direction. These gateways will have localized pedestrian safety and speed reduction benefits, while also communicating to drivers that they are entering residential streets.
- A comprehensive streetscape program could be implemented.

Overview of Operational Improvements

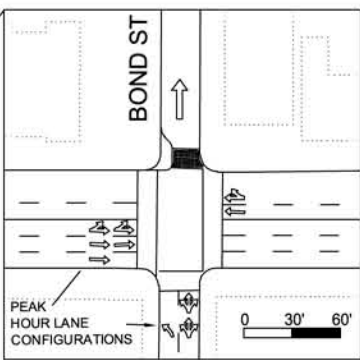
- Modify signal timing and phasing in order to include protected pedestrian phases where possible. Specific improvements include exclusive pedestrian phases with no vehicular conflicts, Leading Pedestrian Intervals (LPI) to give pedestrians a headstart free of vehicular conflict, longer crossing times and protected left turn phases to further reduce vehicular conflicts.



ATLANTIC AVENUE (TRAVEL STREET)

FROM SMITH STREET TO FLATBUSH AVENUE

HOYT/BOND/NEVINS PREFERRED OPTION:

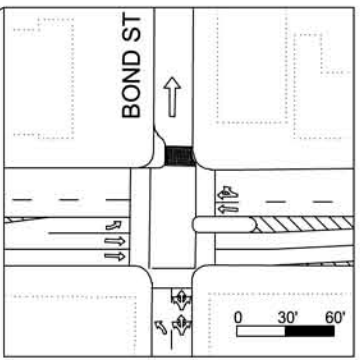


- Pros:**
- Increases pedestrian safety on sidewalks and crosswalks
 - Reduces feeling of exposure on Atlantic

- Cons:**
- Doesn't shorten distance crossing Atlantic Ave

- Add gateway treatments
- Add Leading Pedestrian Interval (LPI)

HOYT/BOND/NEVINS DISCARDED OPTION:



- Pros:**
- Increases pedestrian safety on crosswalks
 - Divides and reduces crossing distance on Atlantic Ave

- Cons:**
- Loss of parking on Atlantic Ave
 - Feeling of exposure for pedestrians along Atlantic

- Add gateway treatments
- Shift lanes to provide a pedestrian refuge

ACTIONS SUPPORTING STRATEGY

Overview of Physical Improvements

- Install neckdowns on side streets where possible to minimize crossing distances, improve pedestrian visibility, and encourage vehicles to turn at slower speeds.
- Install gateway treatments consisting of neckdowns and raised, textured crosswalks at minor side streets in the outbound direction. These gateways will have localized pedestrian safety and speed reduction benefits, while also communicating to drivers that they are entering residential streets.

- A comprehensive streetscape program could be implemented.

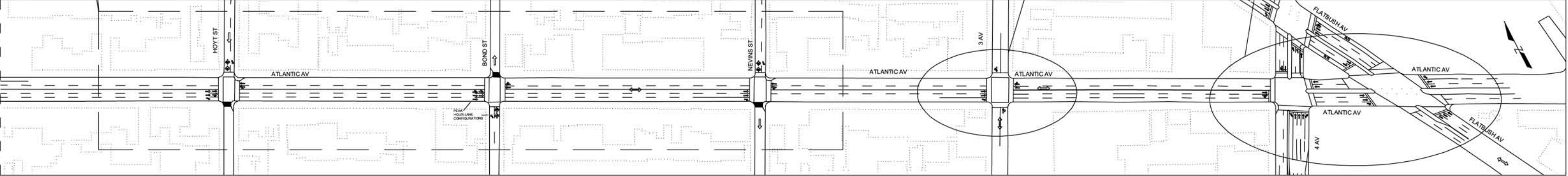
Overview of Operational Improvements

- Modify signal timing and phasing to maximize protected pedestrian phases where possible. Specific improvements include exclusive pedestrian phases with no vehicular conflicts, Leading Pedestrian Intervals (LPI) to give pedestrians a headstart free of vehicular conflict, longer crossing times and protected left turn phases to further reduce vehicular conflicts.

- Increase pedestrian time to cross Atlantic Ave

- Install medians
- Increase pedestrian crossing times
- Improve signal coordination along Atlantic Ave
- Add a neckdown
- Make NB 4th Ave left-turns protected

CONTINUED FROM PAGE 14



7.2.1.5 Boerum Place North

Boerum Place North is the subject of a separate planning effort by the Department of Design and Construction under the auspices of the office of the Brooklyn Borough President and so is not addressed separately as part of this strategy.

7.2.1.6 Cadman Plaza West/Court Street North

Cadman Plaza West/Court Street North carries a large number of pedestrians, especially in its southern section near Brooklyn Borough Hall and the Atlantic Avenue intersection. The strategy is therefore to facilitate this pedestrian activity through gateway treatments on a number of side streets. These entrance treatments consist of textured crosswalks at some locations and textured crosswalks combined with neckdowns at others. They serve to encourage and facilitate north-south pedestrian movement along the road and to reduce the perceived threat to pedestrians posed by cars turning in and out of these side streets.

At the Tillary Street/Clinton Street/Cadman Plaza West intersection substantial current road space is retrieved for non-motorized use. At the northwest corner of this intersection the project team initially suggested reclaiming a large area of unused road space for sidewalk; however, members of the Community Board 2 Traffic Calming Task Force pointed out that this space is used for pick up and drop off of elderly residents in the area and so it has been redesigned to facilitate this activity.

CADMAN PLAZA WEST/COURT STREET (TRAVEL STREET)
OLD FULTON STREET TO JORALEMON STREET

CONTINUED ON BOTTOM LEFT

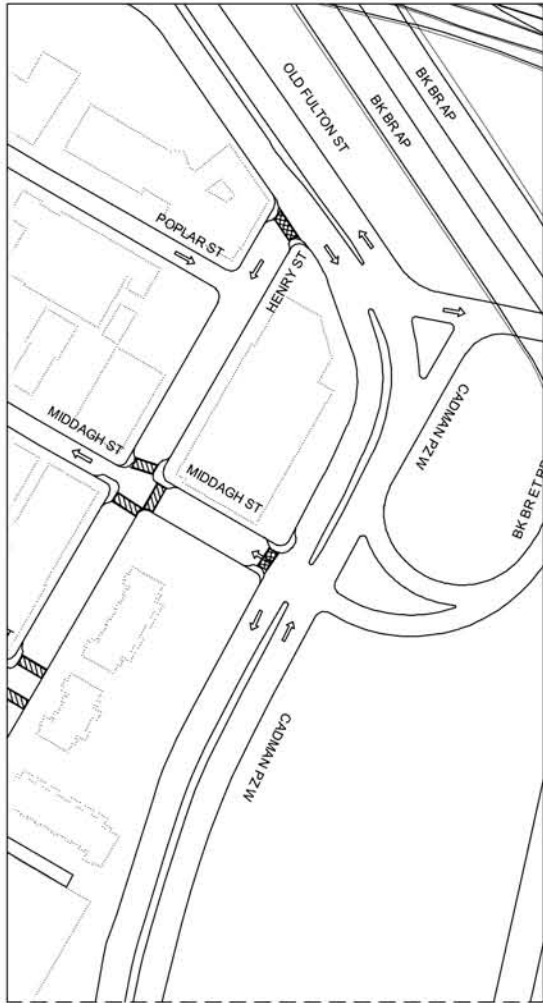
ACTIONS SUPORTING STRATEGY

Overview of Physical Improvements

- With the high number of pedestrians, a primary measure is to install neck downs on side streets where possible to minimize crossing distances, improve pedestrian visibility, and encourage vehicles to turn at slower speeds.
- At the Cadman Plaza West/Clinton Street/Tillary Street intersection, modify the northbound lane configuration to one through and one right turn lane. Create a new island separating northbound right turn and through movements. Widen the median to shorten the eastbound left turn lane. Also, widen the sidewalks and median to remove two westbound Tillary St lanes.
- Add an off-street bike facility on the north side of Tillary Street between Cadman Plaza W. and Adams Street.
- A similar streetscaping program to that of Court Street south of Atlantic Avenue could be used, or perhaps a distinct streetscaping program could be implemented.

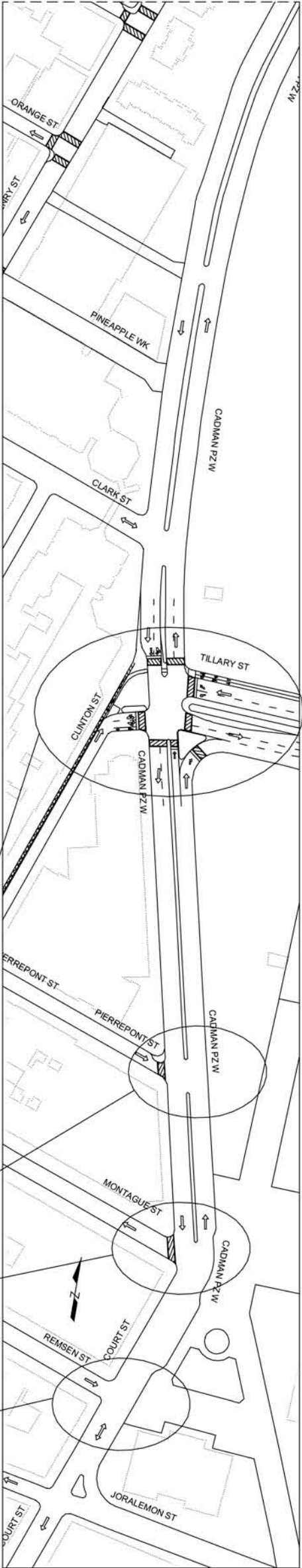
Overview of Operational Improvements

- Modify signal timing and phasing to maximize protected pedestrian phases where possible.
- Specific improvements include an exclusive pedestrian phase with no vehicular conflicts, Leading Pedestrian Intervals (LPI) to give pedestrians a vehicular conflict-free head start, longer crossing times and protected left turn phases to further reduce vehicular conflicts.



CONTINUED ON TOP RIGHT

- Widen medians and sidewalks
- Modify signal timing
- Create new island with controlled right turn
- Modify lane configurations
- Add an off-street bike trail on the north side of Tillary Street
- Maintain access to apartment building on corner
- Add a neckdown
- Texture crosswalk
- Texture Crosswalk
- Add an All Pedestrian Phase (completed as part of the pilot program)



7.2.1.7 Flatbush Avenue

Flatbush Avenue is one of the major traffic arteries in the study area and its efficient operation is an important ingredient in Downtown Brooklyn's management plan. While it currently carries a heavy volume of traffic effectively, Flatbush Avenue is less effective in accommodating pedestrians walking along and across it. It divides Fort Greene from the Central Business District (CBD) and also contains obstacles – curb breaks and alignment discontinuities - for pedestrians walking along it. Flatbush Avenue's lack of consistent and high quality urban design elements and high traffic volumes make for an overall suboptimal pedestrian experience.

The width and alignment of Flatbush Avenue and the high traffic volume it carries makes it difficult for pedestrians to cross. This was addressed by identifying locations for additional mid-block pedestrian crossings in the long sections of Flatbush Avenue that lack signalized crossing opportunities. In field surveys in 1999 and 2000, jaywalking was observed at these long blocks, which exist because of Flatbush Avenue's diagonal orientation with respect to the Downtown Brooklyn street grid. Warrant surveys were conducted at Fleet Street and Tech Place and found that both satisfied the warrant for new signalized pedestrian crossings (refer *Appendix G*). NYCDOT has since installed the signalized crossing at Fleet Street and the proposed design for a pedestrian crossing at Tech Place has been advanced.

Some of the major traffic initiatives investigated to resolve major traffic bottlenecks along this corridor are discussed in *Section 7.5*. In addition, a number of other opportunities to improve the street environment and to return road space to non-motorized use along the length of Flatbush Avenue without adversely affecting traffic operations are identified. This is consistent with the traffic calming objective of improving the operations of streets in the broad sense and to share the dividend between all its users.

Throughout the length of Flatbush Avenue between Tillary Street and Atlantic Avenue, some opportunities exist to widen the median or install new median. Urban design treatments along this median would soften the visual barrier that Flatbush Avenue presents, although the location of subway gratings may limit what can be done here.

Other opportunities exist to reclaim roadway space for pedestrians. At Flatbush Avenue's intersection with Tillary Street, the medians currently stop short of the crosswalks and leave pedestrians exposed during their whole road crossing. Extending the existing medians to encompass the crosswalks would provide greater protection to pedestrians. Widening the medians on the west and south legs of the intersection at Tillary Street and Flatbush Avenue is also recommended. This latter treatment would increase space available for pedestrians and improve lane discipline for motorized traffic. All turns should be protected, which for safety reasons is more appropriate at this intersection (NYCDOT modified the left turn signal phase for both directions from "permitted-protected" to "protected only" in December 2000). The signal timings should also be adjusted, though only to the extent that the intersection operates as well as at present in peak periods. The revised signal timings at Tillary Street mean that the length of the exclusive left turn lane on its southern approach can be reduced and the median widened at Tech Place to provide better protection for pedestrians at the recommended pedestrian crossing described above.

Duffield and Gold Streets currently act as a service road running parallel to and west of Flatbush Avenue in the vicinity of MetroTech. The design of Myrtle Avenue's western approach has reflected this, with its median stopping well short of Flatbush Avenue. This design allows traffic traveling south on Flatbush Avenue to cut through its intersection with Myrtle Avenue to reach Gold Street. Pedestrians on the west side of Flatbush Avenue must execute a dogleg to walk

through this intersection and contend with traffic – and in particular trucks – turning off Flatbush Avenue at high speed. While the needs for a service road are understood, a variety of safety and operational problems are apparent. The reconfiguration of this intersection involves realigning the access to Gold Street to a point south of Myrtle Avenue. This should be designed to allow easy access by the service vehicles that access loading docks on Gold Street south of Myrtle Avenue while preventing the current high-speed maneuver. Moving the access point south of Myrtle Avenue also allows substantial space to be recovered for non-motorized use. This will benefit pedestrians in the area by providing them with a less circuitous path along Flatbush Avenue and an important streetscape opportunity. Design and implementation of the realignment of Gold Street will be subject to NYCDOT Highway Design approval.

Figure 7.2 Pedestrian conditions on Flatbush Avenue south of Myrtle Avenue



At Flatbush Avenue's intersections with both Myrtle Avenue and Willoughby Street the project team initially suggested replacing the current left turn for northbound Flatbush Avenue traffic with "jug handle" diversions to the east of Flatbush Avenue onto Myrtle Avenue and Willoughby Street respectively. By replacing left turns from Flatbush Avenue with crossing traffic from the east, the Flatbush Avenue median could be widened at these locations. However, the plan does have drawbacks in terms of clarity and intuitiveness – clear and prominent signage would be needed to alert left turning drivers to the need to turn right up Prince Street and Fleet Street respectively, since this is the main point of access to MetroTech. In addition, this idea created traffic intrusion into the area to the east of Flatbush Avenue, potentially conflicted with plans for development of the Brooklyn Academy of Music (BAM) Cultural District, and reduced access to the Willoughby Street corridor targeted for redevelopment by the Downtown Brooklyn Council.

Accordingly, Community Board 2 and the project team decided that retention of the current left turn lanes on Flatbush Avenue was a better approach for these intersections.

The intersection of Fulton Street with Flatbush Avenue experiences a heavy concentration of pedestrian activity because of heavy bus traffic on Fulton Street, the presence of subway station entrances and concentration of business and retail uses in the surrounding area. The action plan widens medians and introduces neckdowns to maximize the space available for pedestrians. It also introduces a more direct pedestrian crosswalk on the intersection's southern leg and introduces a leading pedestrian interval and a protected left turn from Fulton Street east to make the task of crossing Flatbush Avenue easier and safer for pedestrians. Some of the operational problems at this intersection result from poor crossing discipline by pedestrians, a problem exacerbated by the pedestrian crossing immediately to its south, which encourages pedestrians to use all road space between Fulton Street and the pedestrian crossing as an active crossing area. Extension of the pedestrian fencing at this location is suggested to encourage pedestrians to cross at appropriate locations. Finally, signal timing changes can be implemented to improve traffic flow through this intersection, as shown in *Table 7.1*. Detailed Synchro analysis of these improvements can be found in *Appendix F*.

Table 7.1 Current and Proposed Traffic Conditions at Flatbush Avenue/Fulton Street Intersection

<i>Approach</i>	<i>Existing (2000)</i>				<i>Proposed Changes</i>			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	<i>LOS</i>	<i>Int. Delay</i>	<i>LOS</i>	<i>Int. Delay</i>	<i>LOS</i>	<i>Int. Delay</i>	<i>LOS</i>	<i>Int. Delay</i>
Fulton Street WB	D	30.5 sec	C	33.5 sec	D	38.2 sec	C	28.7 sec
Fulton Street EB	C	34.2 sec	C	34.1 sec	C	28.1 sec	D	38.2 sec
Flatbush Avenue NB	A	0.2 sec	A	6.4 sec	A	4.8 sec	B	10.8 sec
Flatbush Avenue SB	B	17.7 sec	C	22.5 sec	A		B	10.4 sec

Source: Traffic volumes from 330 Jay Street EIS

Pedestrians crossing at the intersection of Flatbush Avenue and Livingston Street currently must use a traffic island at the intersection's northwest corner. This island exists to facilitate right turns for southbound traffic on Flatbush Avenue to Livingston Street; however, this occurs at the expense of pedestrians who must gather on the exposed traffic island. The action plan for this location reconnects the pedestrian island to the sidewalk, with obvious benefits for pedestrians. The small number of right turning vehicles¹⁰ can turn at Nevins Street to reach Livingston Street with no impact on intersection level of service.

At Flatbush Avenue's intersection with Schermerhorn Street, 3rd Avenue and Lafayette Avenue, BAM's master planners have identified Lafayette and 3rd Avenues as a pedestrian axis linking

¹⁰ Right-turning volumes from southbound Flatbush Avenue to westbound Livingston Street are 19 in the AM peak hour, 14 in the PM peak hour according to the 330 Jay Street Environmental Impact Statement

BAM with Atlantic Avenue. Some modifications to lane marking and signal timing are suggested at this intersection. A median on Schermerhorn Street to improve lane discipline and to make crossing easier for pedestrians is recommended. This intersection also marks the northern end of a median on Flatbush Avenue that could extend south to and beyond 4th Avenue. This median is intended to provide protection for pedestrians crossing Flatbush Avenue as well as a landscaping opportunity. Although not shown on the plan, the traffic island on the southwest corner of the Flatbush Avenue/Schermerhorn Street intersection could be reconnected to the sidewalk and a pedestrian plaza created; the traffic feasibility of this would need to be explored.

At Flatbush Avenue's intersections with 4th Avenue and Atlantic Avenue a number of median islands intended to create pedestrian refuges are suggested; these would improve traffic discipline, improve the street environment, and strengthen the connection to the Long Island Rail Road station. Some limited improvements to traffic operations can be achieved through improved signal coordination in this area. This is discussed further in *Section 7.5*. *Table 7.2* shows the improvements in traffic operations which these signal timing changes yield. Detailed Synchro analysis of these improvements can be found in *Appendix F*. In November 2003, NYCDOT installed Advanced Solid State Traffic Controllers for the signals at this intersection to optimize coordination.

Table 7.2 Current and Proposed Traffic Conditions at Flatbush-Atlantic-Fourth Avenue Intersection

<i>Approach</i>	<i>Existing (2000)</i>				<i>Proposed Changes</i>			
	AM Peak Hour		PM Peak Hour		AM Peak Hour		PM Peak Hour	
	<i>LOS</i>	<i>Int. Delay</i>	<i>LOS</i>	<i>Int. Delay</i>	<i>LOS</i>	<i>Int. Delay</i>	<i>LOS</i>	<i>Int. Delay</i>
Flatbush Ave – Fourth Ave	C	26.3 sec	C	20.0 sec	D	32.5 sec	B	17.0 sec
Flatbush Ave – Atlantic Ave	C	23.4 sec	C	29.2 sec	C	23.4 sec	C	28.9 sec
Atlantic Ave – Fourth Ave	D	49.7 sec	D	43.4 sec	C	27.6 sec	C	22.0 sec

Source: Traffic volumes from 330 Jay Street EIS

As a major Travel Street with considerable commercial and institutional activity, Flatbush Avenue plays a vital role in Downtown Brooklyn. Its traffic carrying role is cited in a number of environmental impact statements (EISs) and the State Implementation Plan (SIP). Any changes on Flatbush Avenue could have areawide as well as localized impacts. In addition, it is the centerpiece of a development proposal being advanced by the Department of City Planning, EDC and the Mayor's Office for Economic Development and Rebuilding. DCP has developed a series of proposals to improve conditions along the corridor. Therefore, the proposals for Flatbush Avenue would need to be evaluated not only for capacity and LOS impacts but for their impacts on the SIP, EISs and Downtown Brooklyn redevelopment.

FLATBUSH AVENUE (TRAVEL STREET)

FROM TILLARY STREET TO DEKALB AVENUE

ACTIONS SUPPORTING STRATEGY

Overview of Physical Improvements

- Widen sidewalks to take advantage of unused roadscape and provide pedestrian refuges that extend into the crosswalk and are wide enough to make pedestrians feel safe.
- Install neckdowns on side streets where possible to minimize crossing distances, improve pedestrian visibility, and encourage vehicles to turn at lower speeds.
- Provide mid block crossings to break up the long blocks and create safer crossing opportunities at popular crossing locations.
- Rationalize lanes at various locations to reduce ambiguous driving conditions that lead to safety problems.

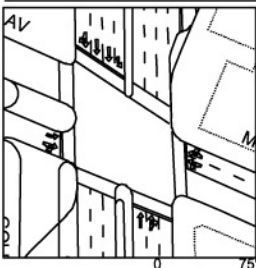
Overview of Operational Improvements

- Modify signal timing and phasing to maximize protected pedestrian phases where possible. Specific improvements include exclusive pedestrian phases with no vehicular conflicts, Leading Pedestrian Intervals (LPI) to give pedestrians a head start free of vehicular conflicts, longer crossing times and protected left turn phases to further reduce vehicular conflicts.
- Improve coordination between signals along this corridor to improve vehicular traffic conditions which will encourage drivers to use Flatbush Avenue as opposed to the neighborhood side streets.

Note: All improvements require NYCDOT review.

- Revise signal timings to make left-turns protected-only
- Widen medians
- Remove one NB through lane
- Add landscaping barriers
- Modify park in NW corner to remove pedestrian shortcut
- Add signalized mid-block crossing
- Shorten storage length of a NB left-turn lane to widen the median

MYRTLE AVE DISCARDED OPTION:

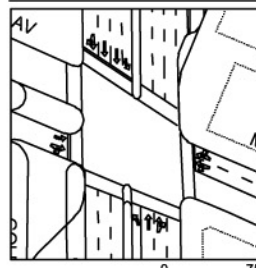


- Pros:**
- Provides a wide safe median into the crosswalk
- Cons:**
- Drivers have to make a jug-handle turn in order to make a left onto Myrtle

- Add Neckdowns
 - Provide an extra pedestrian phase
 - Make SB left-turn lane protected-only
 - Rationalize U-shaped entry/exit
- 1A. Widen existing median
1B. Re-route Flatbush left-turns



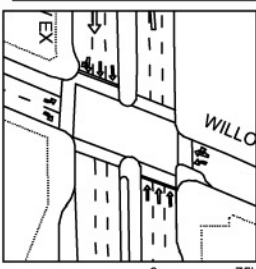
MYRTLE AVE PREFERRED OPTION:



- Pros:**
- Provides a median in the crosswalk for pedestrians
- Cons:**
- Median is not wide enough to handle pedestrian volumes

- Add neckdowns
 - Provide an extra pedestrian phase
 - Make SB left-turn lane protected-only
 - Rationalize U-shaped entry/exit
- 2A. Extend median Into crosswalk

WILLOUGHBY ST DISCARDED OPTION:

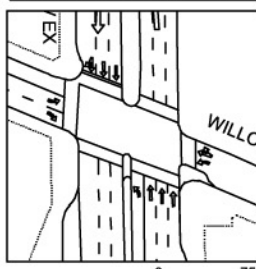


- Pros:**
- Provides a wide safe median into the crosswalk
- Cons:**
- Drivers have to make a jug-handle turn in order to make a left onto Myrtle

- Provide Willoughby phase with more green time
- 1A. Remove Flatbush NB left-turn phase
1B. Re-route NB left-turns
1C. Widen existing median and extend into crosswalk



WILLOUGHBY ST PREFERRED OPTION:



- Pros:**
- Provides a median in the crosswalk for pedestrians
- Cons:**
- Median is not wide enough to handle pedestrian volumes

- Provide Willoughby phase with more green time
- 2A. Extend median Into crosswalk

- Add Signalized mid-block crossing
- Reduce and remove slip roads
- Widen existing medians
- Add neckdowns
- Rationalize lane widths and alignments for WB approach
- Add more time to the existing LPI

CONTINUED ON PAGE 18



FLATBUSH AVENUE (TRAVEL STREET)
FROM FULTON ST TO ATLANTIC AVE

ACTIONS SUPPORTING STRATEGY

Overview of Physical Improvements

- Widen sidewalks to take advantage of unused roadscape and provide pedestrian refuges that extend into the crosswalk and are wide enough to make pedestrians feel safe.
- Install neck downs on side streets where possible to minimize crossing distances, improve pedestrian visibility, and encourage vehicles to turn at lower speeds.
- Remove the right turn movement from Livingston Street to provide more pedestrian facilities.
- Rationalize lanes at various locations to reduce ambiguous driving conditions that lead to safety problems.

Overview of Operational Improvements

- Modify signal timing and phasing to maximize protected pedestrian phases where possible. Specific improvements include exclusive pedestrian phases with no vehicular conflicts, Leading Pedestrian Intervals (LPI) to give pedestrians a vehicular conflict-free head start, longer crossing times and protected left turn phases to further reduce vehicular conflicts.
- Improve co-ordination between signals along this corridor to improve vehicular traffic conditions which will encourage drivers to use Flatbush Avenue as opposed to the neighborhood side streets.

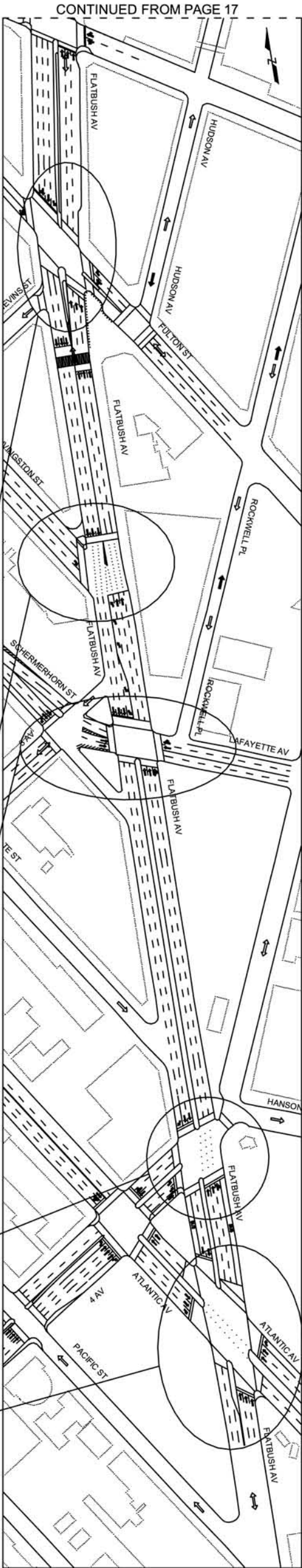
Note: All improvements require NYCDOT review

- Introduce a more direct crossing at the south leg
- Make SB left-turns protected only
- Add neckdowns
- Add a 5 second LPI
- Widen existing median
- Direct pedestrian to appropriate crossing locations with pedestrian fencing

- Remove SB right-turns

- Modify signal timings with 3rd and Schermerhorn
- Make two through lanes for WB approach
- Install median
- Improve signal coordination with 4th Avenue
- Increase all pedestrian phase
- Reconfigure EB approach to two through lanes and one exclusive right-turn lane
- Install medians

- Improve signal coordination with Atlantic Avenue
- Implement LPI
- Install medians



7.2.1.8 Furman Street

Returning Furman Street to its original two-way operation is an important element of the Travel Street strategy for the area. A two-way Furman Street would improve the movement options around the area and, provided the streets are designed and managed appropriately, this improved accessibility could be achieved without significant adverse impact on the surrounding street environment. Indeed, the strategy for Old Fulton Street (described in *Section 7.2.2.10*) has the potential to improve the street environment in this area substantially. The approach at Furman Street reflects the idea that Travel Streets need not carry heavy volumes to fulfill their traffic function. Some Travel Streets, like Furman Street, act as links in the skeletal network that provides direct, though not necessarily high-speed or high-capacity, connections for inter-neighborhood movement. Synchro analysis showing the proposed operations of Furman and Old Fulton Streets can be found in *Appendix F*.

In July 2003, Community Board #2 endorsed the concept of two-way Furman Street, to manage traffic and to provide access to the planned Brooklyn Bridge Park¹¹.

¹¹ An earlier draft (Spring 2003) of this report stated that Community Board #2's Traffic Calming Task Force deferred taking a position on two-way Furman Street until plans for the Brooklyn Bridge Park evolve. Since then, the Community Board has endorsed two-way Furman in response to the earlier draft.

7.2.1.9 Hamilton Avenue

Hamilton Avenue acts as the study area's southern boundary and so this study's investigation is confined to its northern half. While the future reconstruction of the Gowanus Expressway will be an important determinant of the future management of Hamilton Avenue, short term opportunities exist to improve its operations and to limit through traffic intrusion on streets running north from Hamilton Avenue. The intersections of Hamilton Avenue with Clinton, Luquer, Henry and Columbia Streets would all benefit from curb realignment. Such realignment would create a consistent and direct pedestrian path along Hamilton where none exists today, while retrieving substantial unused road space. The designs also require traffic turning from Hamilton Avenue onto these Living Streets to do so at low speeds, with safety benefits for all users in the immediate local area and the potential for improved environment on streets north of Hamilton Avenue.

The project team also considered but then recommended against the idea of closing Clinton Street at Hamilton Avenue. This is described in *Section 7.2.3.5*.

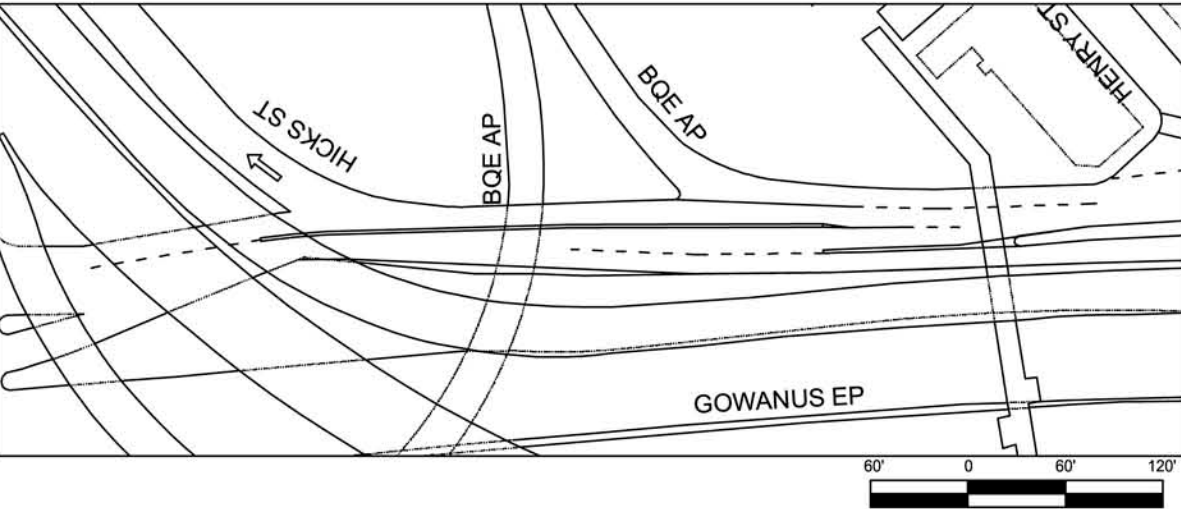
The final element of the strategy for Hamilton Avenue is to address the safety problems caused by traffic weaving from the Gowanus Expressway across Hamilton Avenue traffic to the on-ramp of the BQE (i.e. jumping the line of traffic on the Gowanus/BQE) or to Hicks Street. Two options were explored, one of which would deny access to both the BQE on-ramp and Hicks Street from the Gowanus Expressway by constructing a physical barrier, and the other which would deny access only to the BQE on-ramp. Discussions with the community indicated that the first and more restrictive option was regarded as too extreme and had the potential for an unintended and adverse consequence of forcing traffic traveling from the Gowanus Expressway to the local area north of Hamilton Avenue into Red Hook. The agreed measure addresses the most severe safety concerns at this intersection but does not protect Hicks Street. NYCDOT implemented this measure in 2001.

Figure 7.3. New striping and treatment implemented in 2001 restricts weaving on Hamilton Avenue at the BQE.



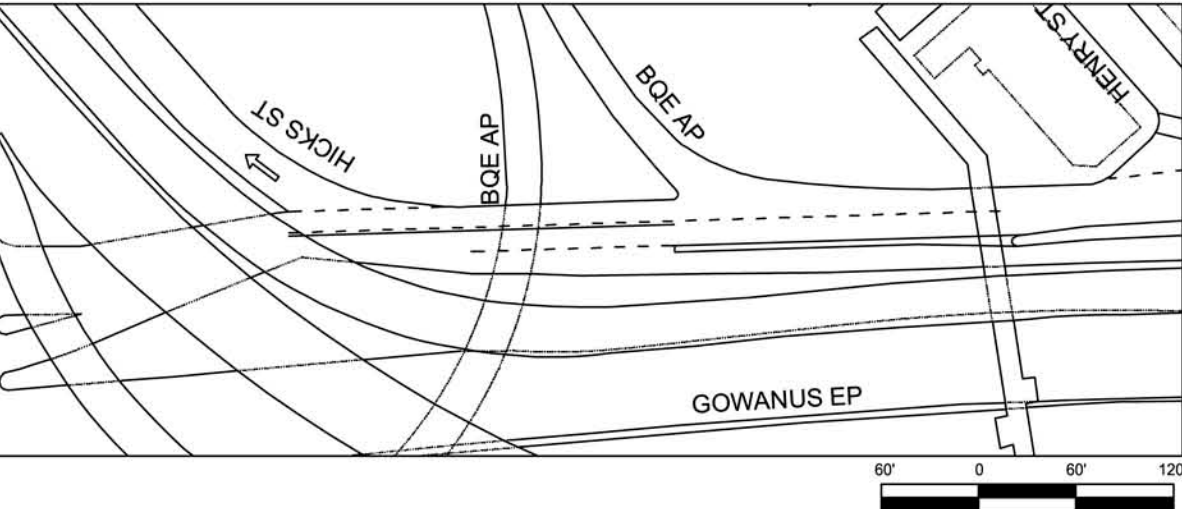
HAMILTON AVENUE (TRAVEL STREET)

HAMILTON AVE DISCARDED OPTION



- 1A. Eliminate re-entry onto the BQE from the Hamilton Ave off-ramp from the Gowanus Expressway.
- 1B. Eliminate access onto Hicks St from the Hamilton Ave off-ramp from the Gowanus Expressway.

HAMILTON AVE PREFERRED OPTION



- 2A. Discourage access onto Hicks St from the Hamilton Ave off-ramp from the Gowanus Expressway.

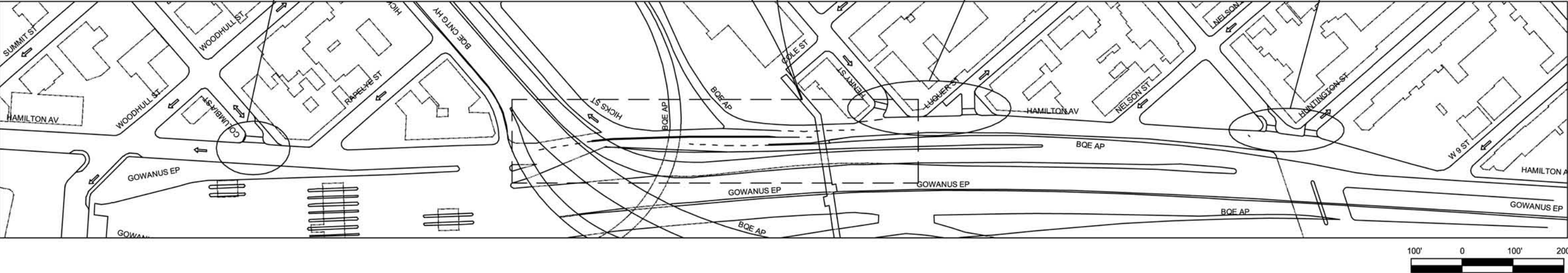
- Pros:**
- Would reduce unsafe weaving on Hamilton Ave
 - Would reduce through-traffic on Hicks St
- Cons:**
- Potential for more traffic on Columbia St

- Pros:**
- Would discourage through-traffic on Hicks St
- Cons:**
- Would not reduce unsafe weaving

- Discourage access onto Columbia St from Hamilton Ave to encourage use of Van Brunt St as a through/truck route.

- Reclaim roadscape
- Slow vehicles turning into Luquer St

- Discourage access from Hamilton Avenue to Clinton St/Huntington St



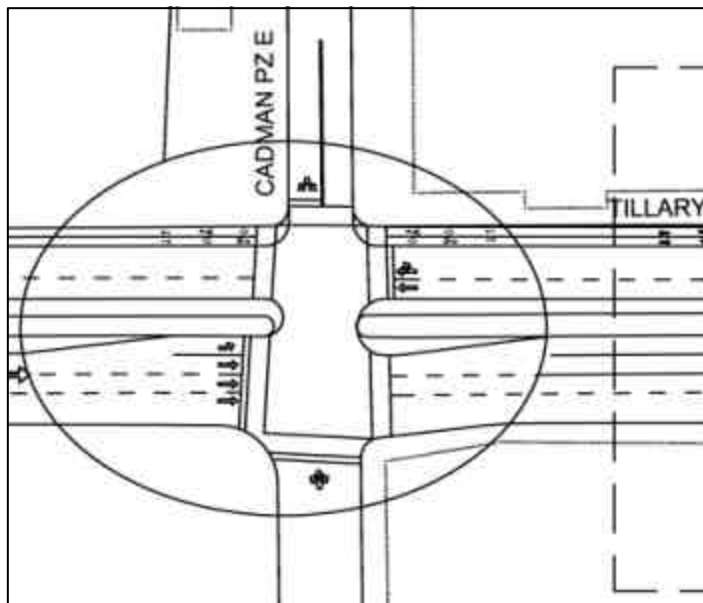
7.2.1.10 Tillary Street

Tillary Street presents a great opportunity to rationalize the overall use of street space to meet broad community needs. Road space adjacent to the current narrow median can be reclaimed over the whole length of the street between Cadman Plaza West and Flatbush Avenue. This can be done either by interrupting the currently continuous left turn lane on the eastbound side of the road or by reclaiming through travel lanes not required for traffic capacity.

An example of the space able to be reclaimed by interrupting the left turn lane was provided by the pilot program treatment at the Tillary Street/Adams Street intersection. This treatment shows that traffic operations can be improved by rationalizing road space. The existing continuous left turn lane sends an inappropriate signal to drivers – in this case that they can use a left turn lane to travel straight through an intersection. Given that drivers know that in practice they cannot do this, there is no traffic capacity cost to reclaiming the left turn lane immediately downstream of each intersection, but there are pedestrian safety and mobility benefits.

The width of Tillary Street west of Adams Street is much wider than is required for traffic – particularly westbound traffic – and New York City Transit bus staging, which occurs on the south side of this section of Tillary Street. Accordingly, the northern curb line can be moved as far as two lanes south without adversely affecting traffic operations. It is proposed that this space be turned over in part to an off street bike lane that links the bike lane on Clinton Street and the bike path to and across the Brooklyn Bridge in the median of Adams Street north of Tillary Street.

Figure 7.4 Plan for the intersection of Tillary Street and Cadman Plaza East, illustrating the use of medians and bike lanes to narrow the roadway



The plans for the part of Tillary Street west of Adams Street are subject to security decisions that impact the road management approach in front of the new courthouse on the northwest corner of Tillary Street and Adams Street. For this and other reasons, the Tillary Street/Adams Street intersection is one that requires further evaluation.

Just west of its intersection with Flatbush Avenue, a number of students cross Tillary Street mid-block while walking between the school on the Flatbush Avenue Extension and the downtown

area. This is an illegal activity that many in the community want to discourage. Short of creating a physical barrier there is only a limited amount that can be done to combat this problem using street design tools. Suggestions include:

- Design of the median to discourage mid-block crossing through dense planting in a raised garden bed. This does, of course, raise the perennial problem of maintenance responsibility.
- Reconfiguration of the pocket park on the north west corner of the Tillary Street/Flatbush Avenue intersection so that pedestrians are not led to the current mid-block crossing point but instead are directed to the signalized crosswalk.

Implementation of the recommended widened medians may be constrained by present requirements from Environmental Impact Statements for surrounding developments (330 Jay Street and others) that stipulate the present lane/median configuration as part of their traffic mitigation plan.

TILLARY STREET (TRAVEL STREET)

ACTIONS SUPPORTING STRATEGY

Overview of Physical Improvements

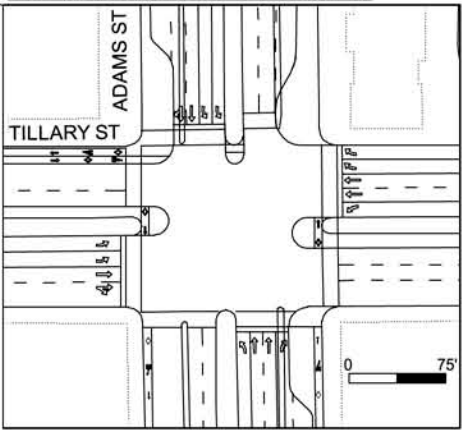
- Remove lanes where possible and reclaim road space for bicycle lanes, pedestrian refuges and wider sidewalks.
- Install neckdowns on side streets where possible to minimize crossing distances, improve pedestrian visibility, and encourage vehicles to turn at slower speeds.
- Add bike lanes to connect existing bike routes, to provide safe bicycling area, and to visually narrow the road.
- A comprehensive streetscaping program could be implemented which could match that of Adams Street or with an identity of its own.

Overview of Operational Improvements

- Modify signal timing and phasing to maximize protected pedestrian phases where possible. Specific improvements include Leading Pedestrian Intervals (LPI) to give pedestrians a vehicular conflict-free head start, longer crossing times and protected left turn phases to further reduce vehicular conflicts.

Implementation of the recommended widened medians may be constrained by present requirements from Environmental Impact Statements for surrounding developments (ex. 330 Jay Street, and others) that stipulate the present lane/median configuration as part of their traffic mitigation plan.

TILLARY/ADAMS OPTION 1:



Pros:

- Greatly reduces pedestrian crossing distance across Adams St and improves pedestrian safety
- Creates area for landscaping and beautification
- Improve traffic and parking discipline
- Provides clear route for cyclists

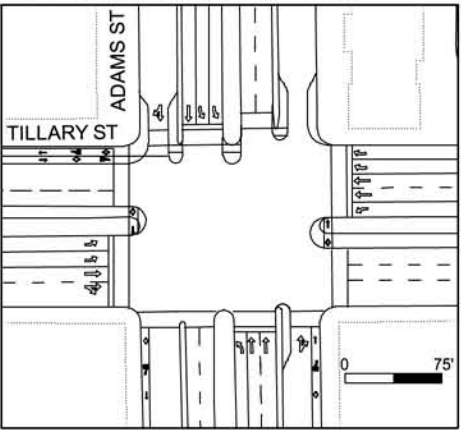
Cons:

- Some loss of parking

- Widen Medians
- Revise signal timing to protect WB left-turns
- Split pedestrian crossing on north leg

1A. Modify service road connections to Adams St to allow narrowing of roadway

TILLARY/ADAMS OPTION 2:



Pros:

- Reduces crossing distance across Adams St

Cons:

- Pedestrians still have to cross four roadways

- Widen medians
- Revise signal timing to protect WB left-turns
- Split pedestrian crossing on north leg

2A. Re-align service roads to allow for better crossing facilities

- Widen sidewalks and median
- Modify lane configuration
- Create new island
- Modify signal timing
- Add an off-street bike facility
- Maintain access to apartment building on corner

- Widen sidewalks and median
- Add an off-street bike facility that could either be on the north side of Tillary St or in the median
- Increase traffic signal cycle length to be consistent with adjacent intersections
- Maintain bus layover lane in the EB direction

- Widen Tillary St medians
- Revise signal timings to make left-turns protected only
- Extend NB right-turn lane

- Widen medians on Tillary St
- Widen medians & islands on Flatbush Ave
- Revise signal timings to make dual left-turns protected only
- Add landscaping and physical barriers to Tillary St median
- Modify park in NW corner of intersection to remove pedestrian cut-through route

