

NoMA

NEIGHBORHOOD ACCESS STUDY AND
TRANSPORTATION MANAGEMENT PLAN

WOWA

NORTH MASSACHUSETTS AVENUE

d.

District Department of Transportation

FINAL - MARCH 31, 2010

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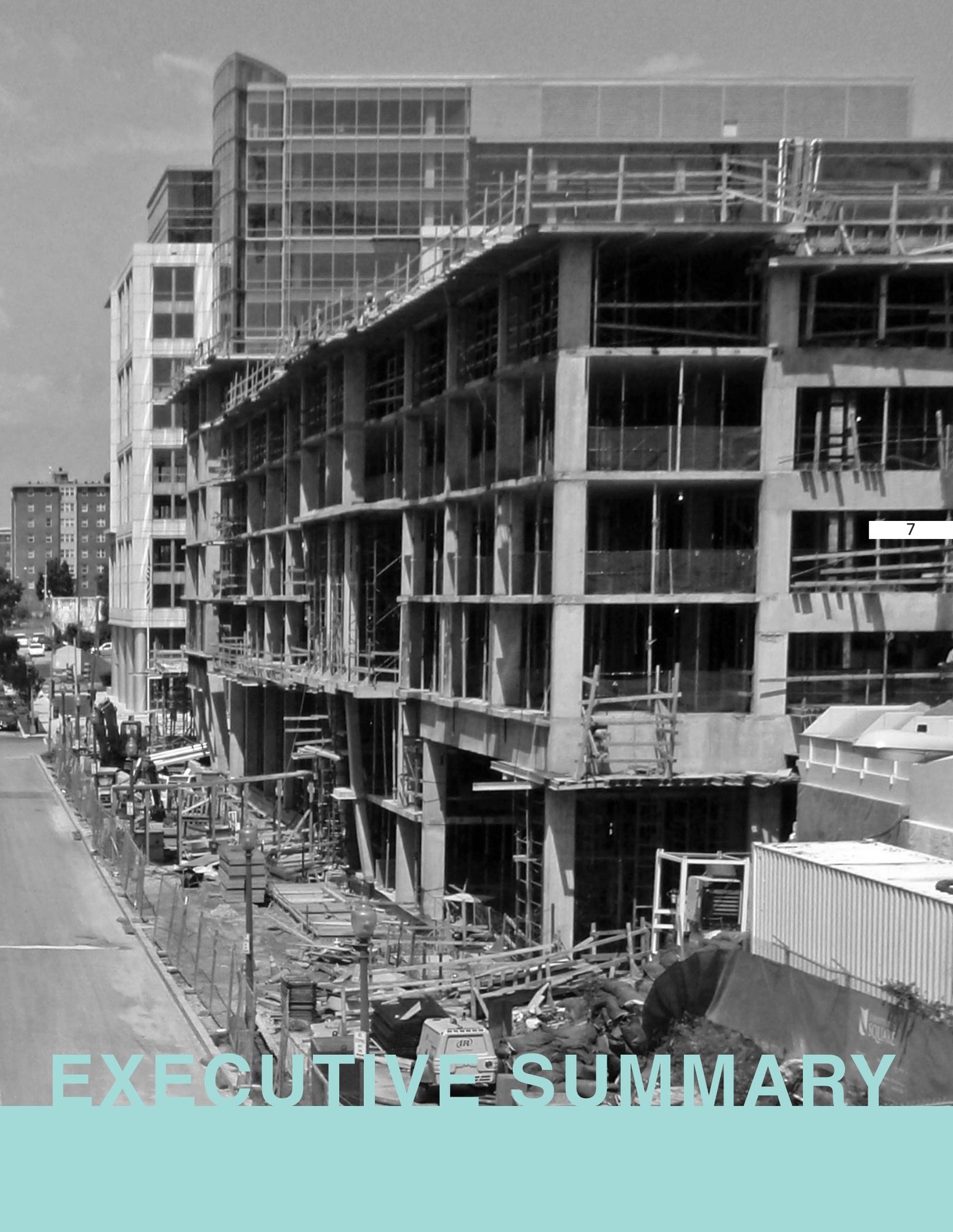
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EXECUTIVE SUMMARY

NoMA is a neighborhood in Washington DC that was named for its location north of Massachusetts Avenue. NoMA is rapidly transforming into one of the District's most exciting mixed use centers. Formerly an industrial area defined by surface parking lots and warehouses, this 35-block neighborhood will soon be home to more than 20 million square feet of high density, mixed use development, including thousands of new residential units interspersed with high rise office buildings and new hotels, restaurants, shops, and cafes. As each new building in NoMA is constructed, the neighborhood's emergence as a vibrant mixed-use center comes closer to reality.

NoMA is well-positioned for this change. It has a high level of access to bus and rail transit and is home to two Metrorail stations, one of which (Union Station) has the highest ridership in WMATA's system. Pedestrian demand is strong and growing, buoyed by surrounding residential neighborhoods and the proximity of destinations such as the U.S. Capital and Gallaudet University. In addition, there are significant new resources for bicyclists in NoMA such as the Metropolitan Branch Trail and the District of Columbia's first *Bike Station*, which will enhance the viability of bicycling in Downtown DC by providing bicycle parking, rentals, repairs and accessories in a centralized "one stop shop" location.

Because of these characteristics, travel within and through the NoMA neighborhood is already highly multi-modal. Approximately half of all peak hour trips in NoMA are completed using something other than a private automobile. Around 30% of all trips originating in NoMA are destined for NoMA or the adjacent downtown, meaning that a high percentage of trips are the ideal length for walking and bicycling.

Nevertheless, there are tremendous constraints on the NoMA neighborhood. The capacity of the existing transportation network is limited. Because of NoMA's location as a gateway to in-bound and out-bound commuter routes, traffic congestion is severe, particularly in the mornings and late afternoons. There is a concern that projected increases in motor vehicle traffic combined with unprecedented growth will result in poor quality of service for all modes of travel. A balance is needed to ensure that people who travel within and through NoMA are able to do so safely and conveniently, regardless of their mode of choice.

PROJECT PURPOSE AND GOALS

The District Department of Transportation (DDOT) initiated the *NoMA Neighborhood Access Study and Transportation Management Plan* to provide a framework for handling expected growth and changing transportation needs in the neighborhood. By providing strategies for managing congestion and mitigating potential conflicts between multi-modal users, the Plan seeks to improve the safety, comfort and efficiency of all transportation modes.

To accomplish this, the following goals were identified:

- *Connectivity*: The NoMA neighborhood is fully connected via a multi-modal transportation system to surrounding neighborhoods, the City, and the region.
- *Multi-modal accessibility*: The transportation network functions for all modes.
- *Sustainability*: Bicycling, walking and transit represent significant proportions of all trips; green features and policies are incorporated.
- *Safety and efficiency*: The transportation network is safe and efficient for all users.
- *Coordination*: Transportation improvements are made in sync with land use changes to ensure continued mobility and accessibility; construction is coordinated so as not to diminish quality of life for residents and visitors.

PLANNING PROCESS

The planning process for the *NoMA Neighborhood Access Study and Transportation Management Plan* included data collection and analysis, review of previous and ongoing plans and road improvement projects, and detailed field work. A traffic model was developed to more fully understand current traffic conditions, and the amount, type, and character of motor vehicle traffic projected in the future. Detailed travel demand and multi-modal Level of Service (LOS) analyses were undertaken. The planning process also involved a great deal of coordination with key stakeholders and agency staff within DDOT as well as other agencies. This included the following:

- *Transportation Steering Committee (TSC)* – The TSC included representatives from various DDOT divisions, as well as DC Office of Planning staff, City Council and Advisory

Neighborhood Commission representatives, the NoMA Business Improvement District (NoMA BID), and local developers. The TSC provided guidance and feedback throughout the development of this Plan.

- *NoMA BID Infrastructure Committee* – This standing committee organized by the NoMA BID included representatives from various developers and other interests in the study area. These individuals participated in a brainstorming workshop, attended TSC meetings, and provided policy guidance and feedback throughout the planning process.
- *Stakeholder Interviews* – Interviews were conducted with key individuals such as DDOT staff responsible for the Metropolitan Branch Trail, DC Office of Zoning staff, and developers with plans to build significant projects in the study area.
- *Other Stakeholder Engagement* – Additional stakeholder input was gathered through meetings and a walking tour with the NoMA BID, and through participation in other ongoing studies including the *WMATA New York Avenue Station Access Study* and the *MWCOG/NoMA BID New York Avenue and Florida Avenue Streetscape Design Study*.

Stakeholder input provided the basis for many of the recommendations in this Plan. Detailed analysis confirmed the need for the mitigating measures that are recommended below.

RECOMMENDATIONS

The recommendations in this Plan will help meet existing and future mobility and access needs in NoMA. They mitigate traffic impacts from proposed developments and expected regional growth by managing and controlling vehicular traffic congestion, while simultaneously encouraging non-motorized modes of travel and enhancing transit operations.

The recommendations reflect a balance between short-term (before 2015) improvements that will require smaller capital expenditures, and medium-term (before 2020), and long-term (before 2030) improvements that, while requiring greater investments and time, will help NoMA to meet projected transportation needs. The recommendations incorporate and build upon many of the recommendations included in the

NoMA Vision Plan and Development Strategy. The recommendations are discussed below.

Short-Term Recommendations

Short-term recommendations include action items that will be fairly easy to accomplish and will not require large capital expenditures, but will nonetheless have an immediate impact on safety and mobility. These action items include policy recommendations, improvements that utilize existing infrastructure, and high-priority, low-capital improvements. Short-term recommendations in this Plan include:

- Filling a gap in the sidewalk network on 3rd Street in between N Street and Florida Avenue.
- Implementing a lane reduction on Florida Avenue to provide space for a wider sidewalk under the CSX tracks.
- Providing Leading Pedestrian Intervals (LPI) at ten intersections.
- Modifying the signal phasing at seven locations to improve the Level of Service (LOS) for all modes.
- Prohibiting left turns (on selected approaches) at the intersection of North Capitol Street and H Street.
- Prohibiting right turns on red at six intersections.
- Providing five pedestrian crossing islands.
- Providing a new SmartBike location at the New York Avenue Metrorail Station.
- Improving bike parking facilities at the New York Avenue Metrorail Station and throughout the study area.
- Forming a Transportation Management Association (TMA) to develop and implement a Transportation Demand Management (TDM) program.
- Improving the bus stop on Massachusetts Avenue near Union Station.
- Improving access to the Metropolitan Branch Trail by extending on-road bicycle routes on R Street and Q Street.
- Implement proposed improvements along First Street as noted in Chapter 3.
- Convert Pierce, Patterson, L, and M Streets to two-way between First Street, NE and North Capitol Street.

A subset of the short-term recommendations were identified as immediate action projects. These immediate action projects are highlighted on page 87.

In many cases, short-term action items provide needed support for longer-term recommendations. For instance, forming the TMA, a non-profit, member-controlled organization often created through a public-private partnership, and tracking performance measures now will allow for implementation of effective parking management strategies in the future.

Medium-Term Recommendations

Medium-term (before 2020) recommendations will be needed to support the NoMA transportation system. Unlike short-term items, these recommendations may require larger capital outlays or additional study before implementation is feasible. While listed as “medium-term,” implementation of these recommendations should occur when funding is available and analysis/design is complete. Implementation of medium-term projects will directly improve transportation conditions in targeted areas. In addition, they will create early successes for decision-makers to highlight, thus building momentum for the longer-term, more challenging recommendations of the Plan. Medium-term recommendations in this Plan include:

- Providing six new traffic signals to improve motor vehicle circulation and LOS throughout the study area.
- Adding exclusive pedestrian phases on Massachusetts Avenue at the intersections with North Capitol Street and 1st Street.
- Providing three new Pedestrian Hybrid Beacon signals.
- Realigning selected intersections to create more compact intersections with right-angle crossings, slow turning motor vehicles and improve visibility.
- Altering lane configurations, for example by adding right-turn only lanes, to maximize the operation and flow of traffic at intersections throughout the study area.
- Implementing an extension to the existing DC Circulator system to better serve NoMA.
- Developing a connected network of bicycle facilities throughout the study area including shared use paths, cycle tracks, bicycle lanes, and shared lane markings.

This Plan recommends a substantial investment in TDM with the purpose of encouraging NoMA’s

residents and visitors to use alternatives to driving whenever possible. As noted, the formation of a TMA is recommended as a short-term action item. In the medium term the TMA should develop and implement an institutional framework for the TDM programs recommended in this Plan, including:

- Funding a NoMA Circulator (open to the general public) to provide neighborhood-wide access to high volume transit routes.
- Providing universal free transit passes to NoMA-based employers and developers or subsidizing (through a cost sharing arrangement) participation in WMATA’s Smart Trip program.
- Conducting annual performance monitoring of commute trends within NoMA to monitor progress and identify additional TDM programs that will have the greatest benefits for the neighborhood.

The TMA will also play a key role in addressing motor vehicle parking in NoMA. There is a significant supply of motor vehicle parking (approximately 7,400 on and off-street spaces) in NoMA today. The number of parking spaces is projected to rise to over 16,500. Most of these additional spaces will be provided in structured garages as part of new development. The supply of motor vehicle parking will impact NoMA’s ability to influence trip choices and meet mode share goals – if parking is plentiful and convenient, people will be encouraged to drive rather than use other modes to access NoMA. In recognition of this fact, this Plan provides specific parking recommendations. These include:

- Managing on-street parking by implementing a “performance-pricing” strategy.
- Limiting increases in new off-street parking where possible.
- Identifying shared parking opportunities.

Long-Term Recommendations

Long-term (before 2030) recommendations are very important to improve NoMA’s transportation system and fully achieve the access and mobility goals set forward by this Plan. However, by their nature most long-term improvements will require several years before implementation is possible due to the need for larger capital expenditures, additional analysis, and the contingency of certain improvements on future

development.

In many cases, future development will create both the need (i.e., travel demand) and potential (e.g., easements, funding, etc.) for construction of long-term improvements. While implementation of most of these recommendations will take 10 to 20 years, opportunities for implementation may occur sooner. DDOT and other stakeholders will take advantage of these opportunities as they arise. Long-term recommendations in this Plan include:

- Implementing a series of improvements along K, L, M, and First Streets in the NoMA neighborhood. Detailed recommendations for these roadways are provided in this Plan. While several options are discussed, a preferred alternative is identified for each of the key corridors, as noted below.
 - K Street and L Street: Implementing a “one-way pair” on K and L Streets should be considered. This would require converting L Street to one way westbound from West Virginia to 1st Street NW and converting K Street to one way eastbound within the same limits. A cycle track on either K or L Street and an extension of L Street over the I-395 interchange via a pedestrian and bicycle bridge could be completed in tandem with this change. In the shorter term, implementing a lane reduction and adding bike lanes on K Street is recommended.
 - M Street: A cycle track is recommended on the south side of M Street. The addition of a Pedestrian Hybrid Beacon at New York Avenue, raised crosswalks, LPI’s, a new Smart Bike location, and covered and secure bike parking at the New York Avenue Metro Station are also recommended. In the shorter term, converting M Street to two-way between New York Avenue and Florida Avenue is recommended.
 - First Street: In the long-term a continuous shared use path on First Street is recommended connecting the Metropolitan Branch Trail and Union Station. In addition to lane configuration, parking, and traffic signal-

related changes, a pedestrian priority curbless street on First Street outside of Union Station is also recommended.

- Implementing grid extensions, alternative access routes, and one-way/ two-way traffic conversions to further improve access and circulation in NoMA. Improvements recommended in this Plan include:
 - Converting one-way streets to two-way operations including New Jersey (from I Street to New York Avenue), 4th Street, NW (between K Street and New York Avenue), M Street (between North Capitol Street/First Street and 4th Street/ Florida Avenue), and Pierce and Paterson Streets (between North Capitol Street and First Street).
 - Designating West Virginia, 4th Street, and 6th Street as alternative access routes into and out of NoMA.
 - Extending L Street (from North Capitol Street to New Jersey, and eventually across I-395 via a proposed pedestrian and bicycle bridge).
- Designating First Street in between Massachusetts Avenue and G Street as a pedestrian priority zone. In addition, this Plan recommends an additional north/south pedestrian priority street in between First Street and North Capitol Street. Note that the proposed pedestrian priority street in between First Street and North Capitol Street would have to be initiated by local developers as DDOT does not have regulatory authority over the required properties.

CONCLUSION

The recommendations in this Plan will improve access, circulation, and mobility for all modes of travel in the NoMA neighborhood. They will improve conditions in NoMA today, while laying the groundwork for a future transportation network that supports projected changes in land uses, densities, and motor vehicle traffic volumes. In doing so, they support NoMA’s transformation into one of the most exciting and vibrant mixed use centers in Washington, DC.





INTRODUCTION

PROJECT BACKGROUND AND CONTEXT

The District Department of Transportation (DDOT) initiated the *NoMA Neighborhood Access Study and Transportation Management Plan* in Spring 2009 to identify strategies for making the most efficient and balanced use of transportation infrastructure in the NoMA (North of Massachusetts Avenue) neighborhood of Washington, DC. The plan identifies strategies to proactively manage congestion and mitigate potential conflicts between multi-modal users. It provides a framework for managing expected growth and changing transportation needs in the area as well as specific, cost-effective strategies for more immediate implementation.

STUDY AREA OVERVIEW

The NoMA neighborhood is located just north of Capitol Hill and Union Station in downtown Washington, DC. The study area for the *NoMA Neighborhood Access Study and Transportation Management Plan* is roughly bounded by R Street NW to the north, Massachusetts Avenue NW to the south, the I-395 interchange to the west, and 6th Street NE to the east. The boundary line of the NoMA neighborhood is shown in Figure 1. The study area for this plan includes the NoMA area and also an area roughly 2-3 blocks outside of it in each direction. A slightly larger study area was selected in order to capture and account for a broader range of traffic patterns and transportation-related dynamics.

PROJECT PURPOSE AND GOALS

The *NoMA Neighborhood Access Study and Transportation Management Plan* seeks to proactively and strategically prepare for changes that are already underway in the NoMA neighborhood, thereby improving the safety, comfort and efficiency of all transportation modes. The Plan includes recommendations for transportation infrastructure improvements, as well as operational and regulatory modifications. It also examines critical issues such as the need to improve access and connectivity.

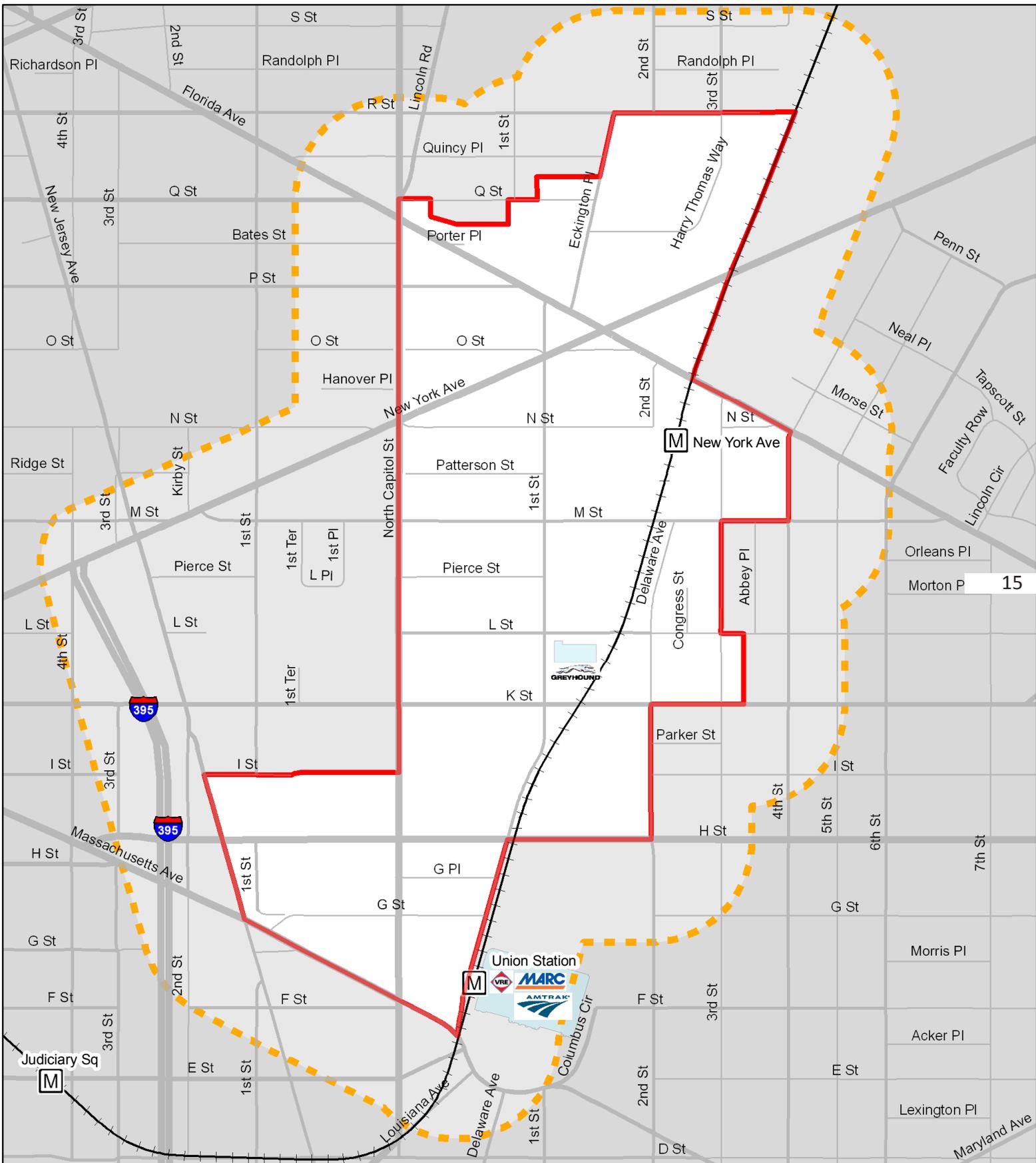
The Plan establishes a vision for the future of the transportation network in the NoMA neighborhood. It builds upon ongoing multi-modal initiatives in NoMA and surrounding areas. While it focuses on actions

that DDOT will take, it also acknowledges the roles that other key partners such as the NoMA Business Improvement District (NoMA BID) will play to achieve the vision.

The *NoMA Neighborhood Access Study and Transportation Management Plan* specifically addresses the following issues:

- It provides recommendations to improve transportation conditions for all travel modes including pedestrian, bicycle, transit, and motor vehicle.
- It highlights low-cost immediate action items such as signal timing adjustments to improve conditions in the near term.
- It identifies short-term improvements such as new traffic signals, pedestrian crossing islands, lane configuration changes, and other spot improvements to improve multi-modal operations and level of service throughout the study area.
- It highlights medium to long-term opportunities along primary corridors in the study area to help the neighborhood meet the projected future traffic demand. Many of these opportunities will require additional study and public input as discussed below.
- It recommends detailed Transportation Demand Management (TDM) strategies, including the formation of a local Transportation Management Association (TMA) to serve as an implementing body. The TMA will assist in managing traffic and parking in the area, promoting alternatives to automobile travel and monitoring progress toward the achievement of a truly multi-modal neighborhood.

The *NoMA Neighborhood Access Study and Transportation Management Plan* presents a proactive vision that builds upon previous planning efforts, including the *NoMA Vision Plan and Development Strategy* and other initiatives such as the District of Columbia's first *Bike Station* at Union Station, both of which support a multi-modal transportation system. In fact, the *NoMA Neighborhood Access Study and Transportation Management Plan* is an implementation project recommended in the *NoMA Vision Plan*, which was completed in 2006 and approved as a Small Area



<p>Legend</p> <ul style="list-style-type: none"> M Metrorail Station Metrorail Red Line Study Area NoMa BID Boundary 	<p>Study Area Map</p> <p>Figure 1</p>	<p>0 490 980 Feet</p> <p><small>Tools: DesignGroup K. TELSON & ASSOCIATES, INC. AECOM</small></p> <p><small>Base Data Source: DC GIS No warranties of any sort, including accuracy, fitness or merchantability, accompany this product.</small></p>
<p>NoMa Neighborhood Access Study and Transportation Management Plan</p>		<p>January 2010</p>

Plan by the DC Council in June 2009. Goals of the *NoMA Neighborhood Access Study and Transportation Management Plan* include the following:

Transportation Goals for the NoMA Neighborhood

- *Connectivity*—The NoMA neighborhood is fully connected via a multi-modal transportation system to surrounding neighborhoods, the City, and the region.
- *Multi-Modal Accessibility* – The transportation network functions for all modes; modal priorities are established along all streets; aggressive targets are set for alternative modes.
- *Sustainability* – Bicycling, walking and transit represent significant proportions of all trips; green features and policies are incorporated at all stages of planning, design, and development.
- *Safety and Efficiency* – The transportation network is safe and efficient for all users.
- *Coordination* – Transportation improvements are made in sync with land use changes to ensure continued mobility and accessibility; construction is coordinated so as not to diminish quality of life for residents and visitors.

HOW THIS PLAN WAS DEVELOPED

The planning process for the *NoMA Neighborhood Access Study and Transportation Management Plan* included data collection and analysis, review of previous and ongoing plans and road improvement projects, and detailed field work. A traffic model was developed to more fully understand current traffic conditions. The model also enabled the project team to evaluate the amount, type, and character of motor vehicle traffic projected in the future. The traffic model is described in detail in Appendix D. Development of the Plan also involved a great deal of coordination with key stakeholders and agency staff within DDOT as well as other agencies. Key coordination activities are described below.

Transportation Steering Committee (TSC) – The TSC provided guidance throughout the development of

this Plan. The Committee included representatives from DDOT divisions such as the Transportation Policy and Planning Administration (TPPA), Infrastructure Project Management Administration, and the Mass Transit Administration. In addition, the Committee included DC Office of Planning staff, City Council and Advisory Neighborhood Commission representatives, the NoMA Business Improvement District, and local developers. The TSC met at key points in the study process to discuss the following:

- Existing conditions and key issues, needs, and opportunities, September 2009
- Multi-modal alternatives analysis, November 2009
- Final recommendations and draft plan review, (anticipated) February 2010

NoMA BID Infrastructure Committee – This standing committee organized by the NoMA BID includes representatives from various developers and other interests in the study area. These individuals participated in a brainstorming workshop, attended TSC meetings, and provided policy guidance and feedback throughout the planning process.



NoMA BID Infrastructure Committee Meeting, June 25, 2009

Stakeholder Interviews – Interviews were conducted with key individuals such as TPPA staff responsible for the Metropolitan Branch Trail, DC Office of Zoning staff, and developers with plans to build significant projects in the study area.

Other Stakeholder Engagement – Additional stakeholder input was gathered through meetings and a walking tour with the NoMA BID, and through participation in other ongoing studies including the WMATA New York Avenue Station Access Study and the MWCOG/NoMA BID New York Avenue and Florida Avenue Streetscape Design Study.

FUTURE AREAS OF STUDY

The project team developed the recommendations in this Plan with the intent of improving access and connectivity in the NoMA neighborhood. The Plan’s recommendations are meant to improve transportation conditions for all modes within NoMA and also into and out of the neighborhood. Because of its central location and the presence of regionally significant corridors such as New York Avenue and North Capitol Street, and important cross town routes such as M Street and H Street, changes in NoMA will necessarily have broader impacts outside of the study area. These impacts should be taken into account in future studies of adjacent areas, as well as during implementation. Future studies should include full community outreach. The implementation of the resulting recommendations will be subject to funding availability.

REPORT CONTENTS

The *NoMA Neighborhood Access Study and Transportation Management Plan* is organized into the following sections:

- Chapter 2 discusses the context for this planning effort, briefly describing existing and future conditions, and highlighting key issues, challenges, and needs.
- Chapter 3 recommends specific improvements in the study area for all transportation modes, as well as supportive policy and programmatic actions that will be needed to improve access and mobility.

- Chapter 4 provides detailed information on recommended Transportation Demand Management (TDM) strategies.
- Chapter 5 provides a guide for plan implementation.
- Chapter 6 summarizes the information provided and highlights the next steps.

CONCLUSION

The planning process and outreach described above generated a great deal of valuable information, and formed the basis of the recommendations contained within this Plan. The *NoMA Neighborhood Access Study and Transportation Management Plan* identifies actions needed to improve transportation conditions for all modes in the near term, while also presenting longer term improvement strategies to accommodate projected changes in land use, population density, and transportation conditions in the NoMA neighborhood. The following chapter provides context for this planning effort and for the recommendations to follow.





PLANNING CONTEXT

INTRODUCTION

This chapter provides a broad overview of previous plans, studies, and guidelines relevant to the *NoMA Neighborhood Access Study and Transportation Management Plan*. It highlights existing and future conditions for all transportation modes in the study area. It also outlines key issues and challenges in NoMA, which were identified in the planning process. This information provides background and context for the recommendations in the following chapter. For additional information and a more detailed discussion of the items below, see the Existing Conditions maps in Appendix G and the Existing Conditions Report.

PREVIOUS PLANS AND STUDIES

The *NoMA Neighborhood Access Study and Transportation Management Plan* builds on existing citywide plans, neighborhood plans, and transportation studies. Numerous plans and studies were reviewed and are discussed in detail in the Existing Conditions Report. However, the following plans and studies provide information most relevant to this Plan.

Key Citywide Plans

- Comprehensive Plan for the National Capital, DC Office of Planning, 2006
- District of Columbia Pedestrian Master Plan, DDOT, 2008
- District of Columbia Bicycle Master Plan, DDOT, 2005
- Metropolitan Branch Trail Master Plan, DDOT, 2005

Key Neighborhood Plans and Studies

- Union Station Intermodal Transit Center Feasibility Study, DDOT-Mass Transit Administration, 2009
- New York Avenue Station Access Study, WMATA, 2009
- NoMA Vision Plan and Development Strategy, Office of Planning, 2006

- New York Avenue Corridor Study, DDOT, 2006
- K, L, M Small Area Transportation Study, DDOT, 2006
- North Capitol Street Transportation Study, DDOT, 2005
- Florida Avenue Market Study, Office of Planning, 2007
- Mount Vernon Triangle Transportation and Public Realm Design Project, DDOT 2006

Key Guidelines and Regulations

- District of Columbia Zoning Regulations
- DDOT Design and Engineering Manual
- District's Standard Drawings for Highways and Structures
- DDOT Public Realm Design Handbook

EXISTING CONDITIONS OVERVIEW

This section provides a brief overview of existing conditions in the study area. It highlights ongoing and planned transportation projects and existing land use and zoning conditions. It provides a summary discussion of existing conditions for pedestrians, bicyclists, transit users, and motor vehicles. A more detailed discussion of the items below is provided in the Existing Conditions Report.

Ongoing and Planned Transportation Projects

A variety of ongoing and planned projects will have an impact on the study area and were reviewed as part of this study. A few of the projects most relevant to this plan are shown in Figure 2 and noted below. Key destinations in the study area are also shown in Figure 2.

- Planned implementation of a “virtual circle” at the intersection of Florida Avenue and New York Avenue
- Rehabilitation of the CSX Bridge on New York Avenue

Figure 2: Ongoing and Planned Transportation Projects

Florida Avenue Market site



Rehabilitation of CSX bridge on New York Avenue



Planned "virtual circle"



New York Ave/Florida Ave/Gallaudet U Metrorail Station



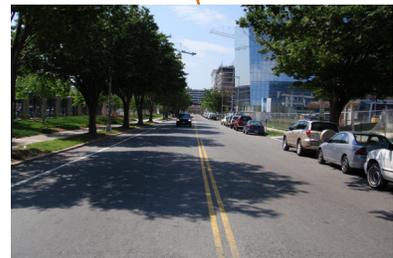
Metropolitan Branch Trail



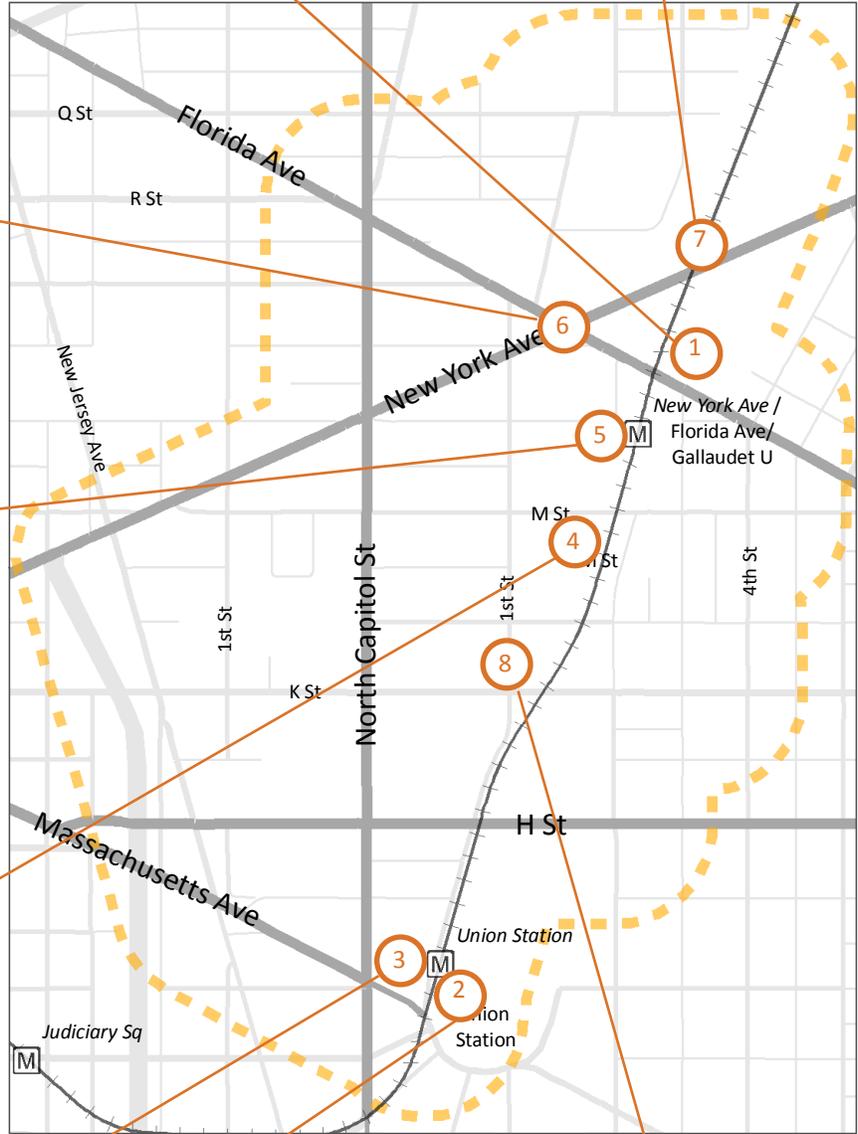
Bike Station
Source: Metropolitismag.com



Union Station



Reconstruction of First Street



- Reconstruction of 1st Street, NE
- Development of a *Bike Station* at Union Station (Opened October 2009)
- Ongoing development of the Metropolitan Branch Trail
- Planned installation of bike lanes on K Street from Mount Vernon Square to New Jersey Avenue.

Land Use and Zoning Conditions

The NoMA neighborhood is in the midst of a significant transformation. What was once a largely industrial area defined by surface parking lots, warehouses, and railroad tracks is becoming a vibrant mixed-use neighborhood. The Comprehensive Plan for the National Capital and the District of Columbia Zoning Regulations, discussed briefly below, provide the foundation for land use and zoning in the study area.

Comprehensive Plan for the National Capital, DC Office of Planning, 2006

The Comprehensive Plan is the guide for all planning efforts in the District of Columbia. One of the guiding principles in the plan is connecting the city. As part of this objective, the plan states that “mobility can no longer be achieved simply by building more roads. “It calls for investments in multi-modal transportation.

Critical transportation-related goals noted in the Comprehensive Plan include:

- Expand the city’s transit system to provide alternatives to the use of single-occupant autos.
- Enhance the city’s corridors for all modes of transportation.
- Increase bicycle and pedestrian connections, routes and facilities.
- Improve the efficiency of the existing transportation system.
- Promote transportation demand management.

In the Comprehensive Plan, the NoMA neighborhood is designated as a Central Employment Area (CEA). These areas “shall include the greatest concentration

of the city’s private office development, and higher density mixed land uses, including commercial/retail, hotel, residential, and entertainment uses.” The CEA is a particularly important designation because it is part of the “point system” used by the General Services Administration (GSA) to establish Federal leases. This means that Federal agencies are encouraged to locate in the NoMA area, likely contributing to greater occupancy rates and investment as compared to other areas in the District and region.

The Comprehensive Plan also includes a Future Land Use Map. Much of the NoMA neighborhood is designated as a “High Density Commercial” area on the Future Land Use map.

District of Columbia Zoning Regulations

The District of Columbia Zoning Regulations control land use, density, height, and bulk characteristics of property in the city. The District of Columbia Zoning Atlas consists of a series of sub-maps identifying the designated zoning for all parcels of land in the city. All construction or rehabilitation on private land must conform to the requirements imposed by the Zoning Regulations and Zoning Map adopted by the DC Zoning Commission, or an exemption must be obtained.

The predominant zoning category in the study area is C-3-C, which allows matter-of-right development for major business and employment centers of medium to high density development, including office, retail, housing, and mixed uses. There are also other commercial zoning categories (including C-2-A, C-M-2, C-M-1, C-M-3, and C-2-B) represented in NoMA and numerous Planned Unit Developments. The NoMA neighborhood is also designated as a “density receiving area,” which further increases allowable densities. There are residential neighborhoods to the east, north, and northwest of the study area, many of which are zoned residential R-4. In addition, there are overlay districts on H Street and Mt. Vernon Triangle.

Transportation Conditions

Private developers have recently invested \$1.5 billion on more than 4 million square feet of office, residential, hotel, and retail space in the study area. In total, more than twenty million square feet of mixed-use development is either under development or will soon be built in NoMA. There are currently approximately 7,400 on and off-street parking spaces

in NoMA today and that number is projected to rise to over 16,500 as part of planned development.

These changes will have significant impacts on access and mobility in NoMA. Projected increases in regional population and employment, as highlighted in a report entitled *Growth Trends to 2030: Cooperative Forecasting in the Washington Region* published by the Metropolitan Washington Council of Governments, will also impact NoMA, especially given the presence of major commuter routes such as New York Avenue. Existing conditions for the primary transportation modes are discussed briefly below.

Motor Vehicles

The study area includes a range of different road types, including interstates, principal arterials, minor arterials, collectors and local roads. It includes the I-395 terminus interchange at New York Avenue, and regionally significant principal arterial routes such as New York Avenue (US Route 50), Florida Avenue, and North Capitol Street. Existing motor vehicle traffic conditions were assessed as part of this study. The analysis included an inventory of existing roadway geometry, the compilation of existing traffic volumes, review of existing signal timing data (including cycle lengths, splits, offsets and phasing), and field observations of traffic operations. This information was used in the development of a traffic model consistent with Highway Capacity Manual (HCM) methodologies to assess existing and future traffic conditions.

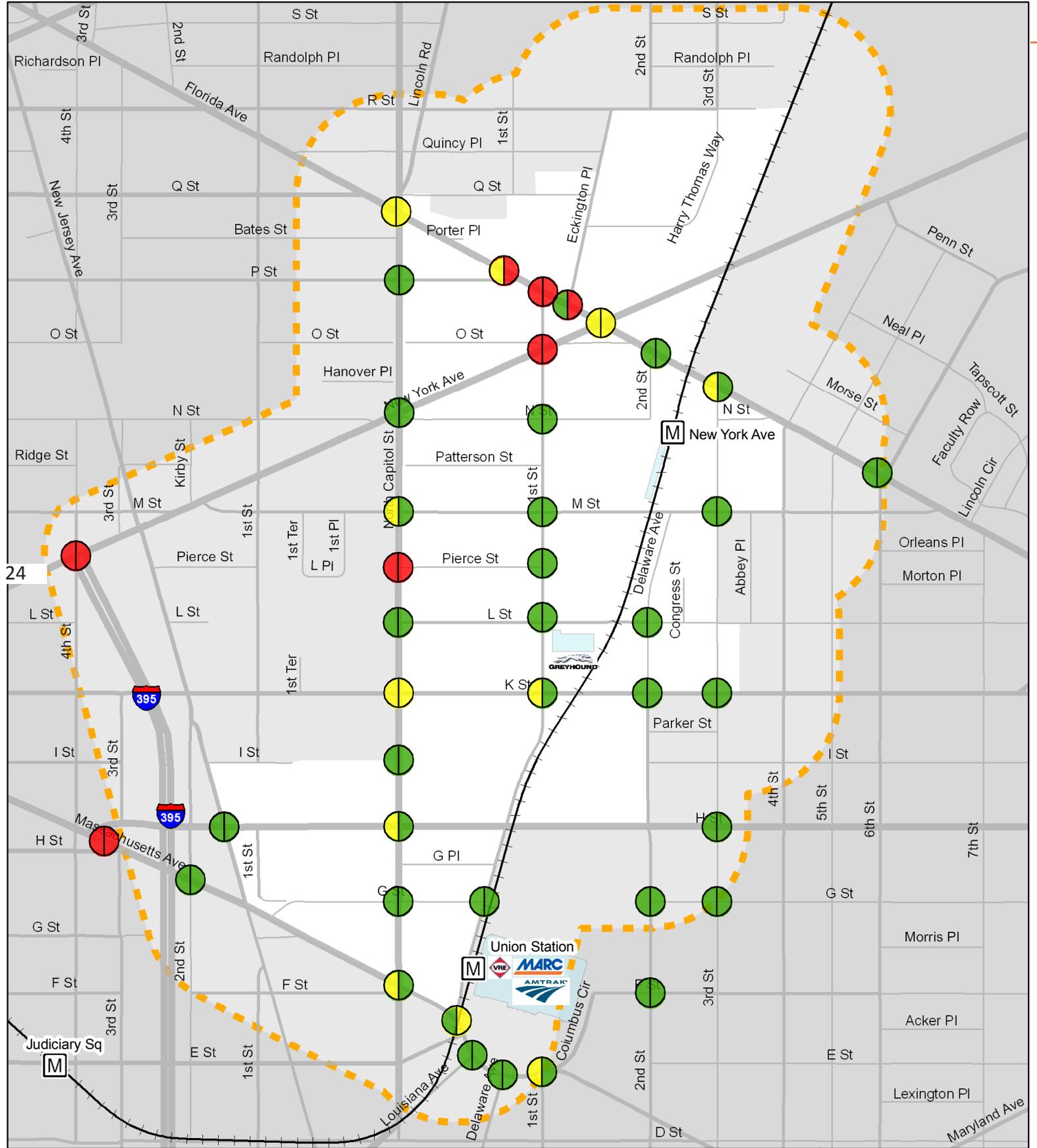
Key findings from this analysis include:

- *Major roadways in the study area carry significant traffic volumes.* Average Daily Traffic (ADT) volumes were assessed along the major roadways bisecting the NoMA study area. New York Avenue, North Capitol Street, H Street, Massachusetts Avenue, Florida Avenue and K Street all carry over 10,000 vehicles per day.
- *Several intersections in the study area experience significant delays and failing Levels of Service (LOS).* The LOS and volume-to-capacity ratios for motor vehicles at intersections and along corridors in the study area were evaluated using the methodology of the HCM to evaluate delay and capacity during the AM and PM peak hours. As shown in Figure 3, the results indicate that while most of the intersections in the study

area operate acceptably at LOS “D” or better, several signalized intersections in the study area currently perform at a failing LOS during peak hours, including Florida Avenue at P Street, Florida Avenue at Eckington Place, New York Avenue at I-395, New York Avenue at 1st Street, and Massachusetts Avenue at H Street.

In addition, several minor street stop-controlled movements entering a major roadway experience excessive delays and LOS “E” and “F” conditions during both peak hours, including Pierce Street turning onto North Capitol Street and 1st Street NW turning onto Florida Avenue. In total, seven intersections were determined to have a failing LOS (E or F) at either the AM or PM peak period at this time. Figure 3 shows the existing LOS.

- *New York Avenue, Florida Avenue, K Street and Massachusetts Avenue all experience failing operations within the study area.* The analysis also evaluated arterial LOS within the study area. Arterial LOS defines the aggregate performance of a connected system of intersections along a roadway, and is based on roadway classification (e.g. arterial or collector) and average travel speed. According to the results of the arterial analysis, New York Avenue, Florida Avenue, K Street and Massachusetts Avenue all experience failing operations within the study area during at least one peak and one direction. In other words, segments of these roadways in one or both directions experience very low speeds and excessive queuing.
- *NoMA is a crossroads.* Through a cordon line and select link analysis, the existing distribution of trips by mode was evaluated. This analysis identified 13,000 daily commuter transit trips into and out of NoMA and around 31,000 daily commuter vehicle trips. Roadways such as New York Avenue carry a significant amount of traffic that has origins and destinations outside of NoMA. Based on the results of an origin destination analysis, through traffic accounted for more than 14% of local traffic on sections of roads such as North Capitol Street and K Street.
- *NoMA already has a strong multi-modal culture.* In both the AM inbound and PM outbound, almost 50% of the people in NoMA



Existing AM and PM Level of Service **Figure 3**

Legend

- M Metrorail Station
- +— Metrorail Red Line
- +— Study Area
- | | | |
|------------------|------------------|------------------|
| AM | ○ | PM |
| Level of Service | Level of Service | Level of Service |
- Level of Service A-C
- Level of Service D
- Level of Service E-F

0 500 1,000 Feet

d.
District Department of Transportation

Toole Design Group K. TELSON & ASSOCIATES, INC.

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traveled by something other than a single occupancy vehicle. The existing share of non-auto travel in NoMA is considerably higher than that for most employment centers, and is a result of NoMA's unique proximity to regional transit connections. A key challenge moving forward will be to ensure that the existing mode share is (at the very least) maintained as the area develops.

- *There is already a significant supply of motor vehicle parking in NoMA.* There are currently approximately 7,400 on and off-street parking spaces in NoMA today.

Future traffic conditions were also assessed as part of this study. Highlights from the analysis of *future traffic* conditions include:

- *A significant amount of additional motor vehicle traffic in NoMA is projected.* Over 11,750 new peak hour vehicle trips are estimated to be generated by NoMA and adjacent background development projects by 2030.
- *The number of intersections that are projected to fail in the future assuming that no improvements are made is likely to increase significantly.* In fact, 21 of 41 intersections – a threefold increase – are projected to fail in the future, assuming no improvements are made, as shown in Figure 4.
- *Queues will be extensive along the major arterials such as New York Avenue (from I-395 to West Virginia Avenue).* This is likely to have significant impacts on the study area, for example by making egress from parking garages difficult.
- *The average delay at traffic signals is likely to increase significantly.* The average delay at traffic signals may be between 5 to 10 minutes compared with 1-3 minutes today.
- *The motor vehicle parking supply is going to increase significantly.* The number of parking spaces is projected to rise to over 16,500. The supply of motor vehicle parking is likely to impact NoMA's ability to influence trip choices and meet mode share goals, as discussed later in this Plan.

The results of this analysis are discussed further in the context of plan recommendations in Chapter 3. For full information on the methodology and results of the traffic model, see Appendix D.

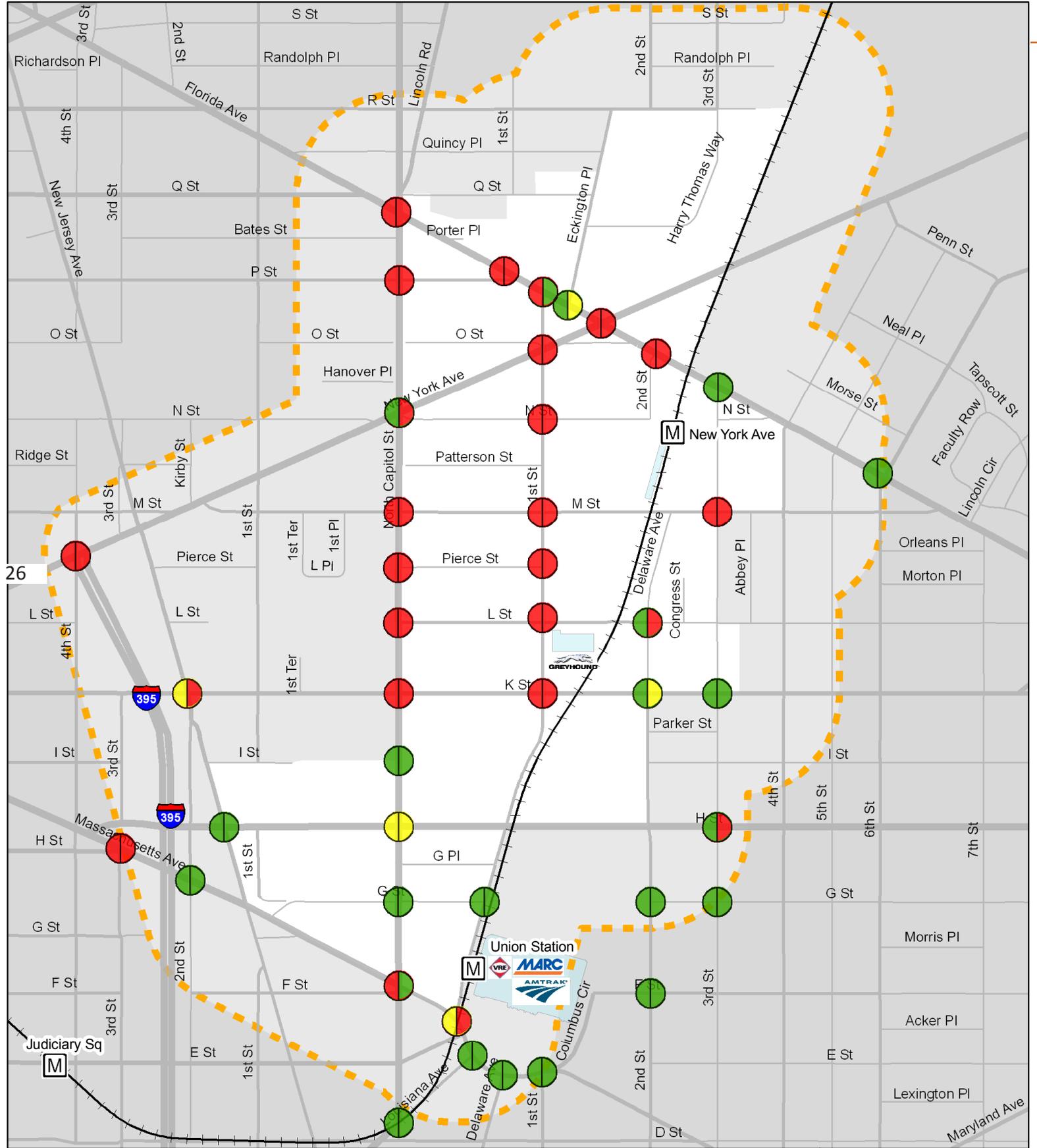
Bicycles

Bicycling conditions in NoMA vary greatly depending on location. Bicycling on certain streets such as 2nd Street and P Street is comfortable because there are low traffic volumes and the narrower width of the road and presence of on-street parking slows vehicle speeds. These conditions allow most bicyclists to comfortably ride on the street without the presence of dedicated bicycle facilities. On wider and busier streets such as Florida Avenue and New York Avenue, the roadway width, heavy traffic volumes and high speeds make riding on the street a harrowing experience for all but the most seasoned bicyclists. Barriers such as difficult intersections and traffic signals that are not timed to allow bicyclists to clear intersections during a yellow phase further complicate bicycle trips in the study area.

There are a number of streets with on-road bike lanes in the study area, including Eckington Place, E Street, southbound 4th Street, northbound 6th Street, eastbound Q Street, and westbound R Street. Bike lanes are provided on First Street northbound from G Street to around N Street and southbound from K Street to G Street.

Signed bike routes are located on First Street from Massachusetts Avenue to Florida Avenue, on Eckington Place north of Florida Avenue, on 2nd and 3rd Street north of R Street, and on Louisiana Street south of Massachusetts Avenue. In addition, the Metropolitan Branch Trail extends through the middle of the NoMA neighborhood, roughly paralleling the Red Line.

Bike racks and bike lockers are located at the New York Avenue and Union Station Metrorail Stations. A *Bike Station* at Union Station opened in October 2009. The station includes around 150 spaces for bike parking. In addition to standard two-wheel bikes, it accommodates recumbent bikes and tandems and offers rentals, repairs and accessories. Additionally, there is a Smart Bike location for short-term bicycle rentals near the Judiciary Square Metro Station (outside of the study area).



Future AM and PM Level of Service (Without Improvements) Figure 4

Legend

- Metrorail Station
- Metrorail Red Line
- Study Area
- AM Level of Service / PM Level of Service
- Level of Service A-C
- Level of Service D
- Level of Service E-F

0 500 1,000 Feet

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Highlights from the analysis of *bicycle conditions* include:

- Busy arterial roadways with high-speed traffic are difficult to travel along and to cross.
- There is inadequate space for bicycling on many streets.
- There are no visible bike facilities on most roadways.
- There are limited east/west bike connections.
- Complex intersections with many turning vehicles create potential conflicts with bicyclists.
- Freeway ramp crossings, small gaps in the bicycle network, and curbside management issues present barriers to bicycle travel.
- Bicycle and bus conflicts exist in the study area.
- There is not enough covered and secure bike parking.
- Additional extensions of and connections to the Metropolitan Branch Trail are needed.

Pedestrians

Walking conditions in NoMA also vary depending upon location. Most of the roads in the study area have sidewalks in various conditions and level of repair. Newly installed infrastructure includes sidewalks, crosswalks, curb ramps, and pedestrian countdown signals. Landscaping, and other streetscape improvements have recently been completed in the study area, for example along M Street in between the Metro and 3rd Street, NE. The new development that is underway and planned is required to adhere to streetscape and other pedestrian-related design standards and as such will contribute to better walking conditions.

Intersections such as New York Avenue and Florida Avenue are difficult to navigate on foot. The “virtual circle” project will improve pedestrian access and safety, but there will still be room for improvements.

In addition to sidewalks, many of the intersections in the study area have crosswalks, curb ramps, and planted buffer strips in between the sidewalk and the road. There are pedestrian countdown signals at most signalized intersections in the study area, and

a pedestrian actuated traffic signal at the M Street entrance/exit to the New York Avenue Metro Station.

However, many intersections in the study area do not include pedestrian refuge islands even though they are wide and the volume and speed of traffic is high. There are new sidewalks in the vicinity of the New York Avenue Metro Station, but existing sidewalks outside of Union Station are narrow and loading bays and parking garage entrances/exits interrupt the pedestrian line of travel. Sidewalk gaps exist, for example on 3rd Street in between N Street and Florida Avenue. In addition, pedestrian underpasses on K, L, and M Streets include sidewalks, but issues such as lighting and maintenance exist.

Highlights from the analysis of *pedestrian conditions* include:

- Traffic volume and speed contribute to difficult crossing conditions.
- Wide roads and intersections are difficult to cross on foot.
- Loading docks create permanent barriers to walking.
- Construction zones create temporary barriers to walking.
- Pedestrian crowding occurs in specific locations.
- Missing sidewalks were observed, as were narrow and inadequate sidewalks and inadequate sidewalks that do not meet ADA guidelines (as discussed below).
- Driver behavior negatively impacts pedestrian safety and comfort.
- Turning vehicles create potential conflicts with pedestrians.
- There are general pedestrian connectivity issues.
- Improvements to underpasses in the study area are needed.

A note about the Americans with Disabilities Act (ADA)

Accessibility is a critical issue throughout the District, including in the NoMA neighborhood. The City is committed to providing universal access within the public right-of-way for people with disabilities. This is a challenge in the District where many sidewalks and crossings were built well before the Americans with Disabilities Act Accessibility Guidelines (ADAAG) were introduced. While there are mechanisms in place to ensure new construction meets the latest accessibility guidelines for the public right-of-way, there are many locations throughout the City that are not accessible due to narrow sidewalk widths (i.e. pinch points at obstructions), lack of curb ramps, and inaccessible pedestrian signals, among other deficiencies.

ADA-related issues were observed in the study area, including the following:

- Obstacles in and damage to sidewalks.
- Lack of maintenance.
- Inadequate required minimum clear zones for accessible travel on walkways and sidewalks.
- Utility poles, mailboxes, newspaper boxes, railings and other permanent objects obstructing the clear path.
- Driveways that cross sidewalks.
- Intersections without curb ramps or curb ramps that do not meet ADA guidelines.

Transit

NoMA is a transit rich neighborhood and is already a multi-modal community. The data indicate that for commuter trips, transit share is currently 50% and is projected to rise to 65% by 2030. For the total of all combined trips, transit share is currently 27%, and is projected to rise to 38% by 2030. The primary transit facility in the study area is Union Station, a major regional and local transit hub for Washington DC, serving over 32 million people each year with transit services and other amenities. It is the most highly used Metrorail station in WMATA's system, while also serving nine Metrobus and two DC Circulator routes. It is also the primary hub for the MARC and VRE commuter rail systems and is the last stop on AMTRAK's Northeast Corridor.

Union Station is a major shopping and restaurant hub, and due to its historical significance, attracts a large number of tourists. In part because of this, it is a major source of pedestrian activity. As noted, it is also the location of a new bicycle station.

Fixed route transit service is provided in the NoMA study area primarily by the Washington Metropolitan Area Transit Authority (WMATA), the Maryland Transit Administration (MTA), and the Virginia Railway

Express (VRE). WMATA currently operates two different types of transit service within NoMA (Metrorail and Metrobus), and is also a partner of the D.C. Circulator. MTA operates commuter bus routes connecting NoMA to suburban Maryland locations, and also operates Maryland Area Regional Commuter (MARC) trains that serve Union Station. The VRE operates two commuter rail lines serving Union Station. Additional information about each type of transit service is noted briefly below.

- *Metrorail:* Two metro stations serve the NoMA neighborhood. The New York Avenue-Florida Ave-Gallaudet University Metro stop, which opened in November 2004, is located near the N Street/2nd Street intersection. This above ground station has a single island platform between tracks, two elevators, and bicycle parking. It has an average of 4,680 daily passenger boardings. The Union Station Metro stop, located in the study area boundary, provides Metrorail connections to several bus lines and commuter rail services. The underground station has the highest ridership of any Metrorail station with approximately 33,900 daily passenger boardings.
- *Metrobus:* There are 17 bus routes operating on 10 lines with stops in NoMA. These 17 routes carry a total of 51,000 daily passengers. The Metrobus stops within the study area have an average of 24,500 daily boardings and alightings.
- *D.C. Circulator:* The D.C. Circulator is operated by a public/private partnership comprised of DDOT, WMATA, and D.C. Surface Transit, Inc. It has five routes (two of which directly serve NoMA) linking cultural, entertainment and business destinations within central D.C. The Union Station to Georgetown route serves the NoMA neighborhood along Massachusetts

Avenue and is the most heavily used Circulator route. It carries approximately 75 percent of the total daily Circulator riders and has an average daily ridership of 6,200. The Union Station to Navy Yard via Capitol Hill route serves NoMA along Louisiana Avenue before heading south to the Library of Congress and the Washington Navy Yard.

- *Commuter Buses:* MTA provides three Commuter bus routes that serve NoMA: Routes 903, 922, and 950. Route 903 originates in Charlotte Hall, Maryland and provides service to Downtown D.C. Routes 922 and 950 originate in Annapolis, Maryland and provide service to Downtown D.C. While all of these routes have one or two stops in the NoMA neighborhood, the routes generally have higher stop activity closer to downtown DC to the west and south of NoMA.
- *Commuter Rail:* Two commuter rail services, with a total of five lines, serve NoMA via Union Station. MTA operates three MARC train lines that serve Union Station and extend to stations in Maryland and West Virginia, providing a total of 42 round-trips per day. From Union Station, the Penn Line stops at the Baltimore-Washington International Airport and Baltimore Penn Station before ending at stations in either Aberdeen or Perryville and has 19,000 daily passenger trips. The Camden Line terminates at Camden Yards in Baltimore and has 4,500 daily passenger trips, and the New Brunswick Line ends in Martinsburg, West Virginia and has 7,000 daily passenger trips. VRE operates two lines servicing Union Station, Alexandria, and other stops in the Washington metro area, providing a total of 14 round trips per day. The two lines continue to Manassas and Fredericksburg and have a combined average of 3,000 daily passenger trips.
- *Greyhound Bus:* The Greyhound and Peter Pan bus depot is located at the 1st Street NE/L Street intersection. According to the *Union Station Intermodal Transportation Center: Baseline Study Report* the daily Greyhound bus ridership at the Washington depot is around 3,500 passengers. Buses arrive 24 hours a day, with headways of approximately 30 minutes. Though service is less frequent during nighttime hours, the depot handles over 60 buses per day.

Crashes

Crash history in the study area was evaluated using recent crash data. Crash data for 50 intersections within the study area for the years 2005 through 2007 was used in this analysis. There were a total of nearly 1,100 motor vehicle crashes recorded at the 50 study intersections in 2005-2007, of which over 500 resulted in injury. Eleven intersections in the study area were identified as exhibiting a combination of high crash rates and crash frequency. These eleven intersections, listed below, account for over 70 percent of the recorded crashes in the area and have an average crash rate over twice that of the typical intersection within the study area.

- Florida Avenue/New York Avenue NE
- North Capitol Street/H Street
- New York Avenue/First St NE
- North Capitol Street/Florida Avenue
- North Capitol Street/M Street
- First Street/Massachusetts Avenue NE
- North Capitol Street/Massachusetts Avenue
- Florida Avenue/Third Street NE
- North Capitol Street/P Street
- Florida Avenue/P Street
- First Street/L Street

Rear-end collisions are the most prominent type of motor vehicle collision in the study area, especially along the principal and minor arterials. Rear-end collisions are often high in congested areas, where vehicles are required to come to an abrupt stop. Turning/sideswipe collisions are the second most prominent, and are especially high along Massachusetts Avenue. In this case, the street intersects with several north-south roadways on the grid, creating skewed intersections. This may contribute to the high number of turning/sideswipe collisions.

Pedestrian crash histories were also studied in detail to evaluate potential safety issues for those on foot. DDOT recently completed two studies detailing the crash histories of pedestrians and bicycles in the District. Both studies are based on the most recent crash data available at the time and used three

years of data. Based on the 1997 – 1999 crash data contained in the pedestrian report, two intersections in the study area were identified as high accident locations for pedestrians: North Capitol Street/New York Avenue and North Capitol Street/Florida Avenue.

In addition, the DC Pedestrian Master Plan highlighted locations of pedestrian crashes throughout the District. Intersections in the study area that were identified as having a higher number of pedestrian crashes include North Capitol Street where it intersects with K Street and Florida Avenue. Pedestrian fatalities were also noted in many locations in the study area, including the intersections of K Street/First Street and Florida Avenue/First Street.

CONCLUSION

Key issues and challenges were identified through the evaluation of previous plans and studies, analysis of existing conditions for all transportation modes, and stakeholder feedback. These include the following:

- Motor vehicle traffic congestion in NoMA is a significant concern in many locations today, and it will likely be an even bigger concern in the future given local development plans, projected regional growth, and the presence of regionally significant routes.
- The crash analysis shows that there are potential safety issues for both motorists and pedestrians at numerous intersections in the study area.
- The demand for pedestrian accommodations in NoMA is significant in part because the neighborhood is home to two Metrorail stations (one of which has the highest ridership in the entire system), walkable existing land uses and densities, surrounding residential neighborhoods, and the proximity of destinations such as Gallaudet University. This demand will increase as the neighborhood transforms into a mixed-use urban center.
- There are opportunities to convert short trips in the study area to bicycling, especially given important bicycle-related resources such as the Metropolitan Branch Trail, which goes through the heart of the neighborhood, and

the District of Columbia's first *Bike Station* at Union Station.

- While major corridors are well served by transit, there are still transit-related needs and opportunities such as improvements to existing bus stops, potential shuttle consolidations, and connections to future transit routes such as the K Street Transitway and proposed North Capitol Street Rapid Bus Line.

New development will bring mixed land uses and urban densities that support walking, bicycling, and transit, while also increasing the need for education and encouragement programs to manage traffic demand and influence trip choices. The supply of motor vehicle parking will likely impact NoMA's ability to influence trip choice and meet mode share goals.

Recommendations for addressing these issues and meeting the goals identified in this Plan are included in the following chapter.







RECOMMENDATIONS

RECOMMENDATIONS

This chapter provides recommendations that will improve the safety, comfort and efficiency of all transportation modes in the NoMA neighborhood. They include recommendations for infrastructure improvements, as well as operational and regulatory modifications. The recommendations are consistent with goals and policies outlined in the *Comprehensive Plan of the National Capitol* and they incorporate recommendations from previous plans and studies such as the *NoMA Vision Plan and Development Strategy*.

The recommendations provide a framework to accommodate expected growth and evolving multi-modal transportation needs in the NoMA neighborhood. Recommendations are not presented in order of priority in this chapter. A detailed implementation strategy is provided in Chapter 5.

Intended outcomes include:

- Encourage non-motorized modes of travel, specifically by improving pedestrian and bicycle access and safety, and supporting a better balance between all modes of transportation.
- Manage and control vehicular traffic congestion.
- Meet mobility and access needs.
- Support planned development densities and land use changes.
- Mitigate the traffic impacts from proposed developments in NoMA and larger regional growth.
- Improve street connectivity and linkages within the study area and to areas adjacent to the study area.
- Enhance transit operations and facilitate proposed transit improvements.

The recommendations in this chapter were developed through a collaboration between various DDOT departments including the Transportation Policy and Planning Administration (TPPA), Infrastructure Project Management Administration (IPMA), and the Mass Transit Administration (MTA). They incorporate comments and feedback from other DC agencies such as the Office of Planning, as well as a Transportation Steering Committee formed to oversee the development of this Plan, the NoMA BID Infrastructure Committee, and other stakeholders.

ASSUMPTIONS

The recommendations in this chapter are based on a comprehensive existing conditions analysis, modeling of existing and projected traffic operations and conditions, and stakeholder feedback. The year 2030 was selected as the “long term” vision year by the project team. The timeframe for the shorter term recommendations is roughly 5-10 years from plan adoption (or around 2015-2020). They assume that the District of Columbia will have limited capital budgets in the near to medium-term.

A traffic model was developed as part of the planning process, which is based in large part on the Metropolitan Washington Council of Governments’ regional growth projections. The analysis of trip generation for NoMA included potential mode shifts as discussed below; however, it should be noted that regional mode shares are fairly static due to regional model limitations. A conservative approach was taken when estimating potential mode shifts as a result of improved access to transit and improvements to pedestrian and bicycle infrastructure. Larger mode shifts are entirely possible.

The trip generation and traffic potential of new development is estimated based on information currently available for existing and potential development plans. Actual development programs are likely to change as each individual project develops final site plans, financing, tenant selection, and other considerations. This study in no way replaces the need to perform a transportation impact analysis (addressing all modes) for each site. This plan recommends that specific mitigation needs for individual projects and detailed site access issues be addressed through transportation impact studies as projects move through formal development review.

Further Study Required

There are a number of roadways in the study area that have a poor Level of Service (LOS) for motor vehicles, pedestrians, bicyclists, and/or transit users, but opportunities for significant transformation are limited. Roadways such as New York Avenue are already operating at maximum capacity and traffic volumes are projected to continue to grow in the future. While these roadways have been assessed in relation to their impact on NoMA and surrounding neighborhoods as part of this Plan, additional corridor analysis that focuses on the

broader transportation impacts of proposed changes will be needed. Further public involvement and feedback is recommended as the recommendations in this Plan are implemented. Additional items in need of future study are noted in Chapter 5.

Streetcar considerations

DDOT is developing a streetcar network to complement existing transit options and connect neighborhoods in DC. Construction has begun on a new streetcar line in Anacostia and tracks are being laid on H Street and Benning Road. The H Street/Benning Road line, to the east of NoMA, is scheduled to be completed in 2010. A proposal to extend this line through NoMA is being considered. The extension would use the Hopscotch Bridge to K Street via New Jersey Avenue. Also under consideration is a street car line on K Street (west of the study area) that would terminate on 1st Street NE next to WMATA's Union Station pedestrian entrance. These potential alignments are shown in Figure 5 below.



Figure 5: Potential Street Car Alignments

The recommendations in this Plan do not preclude a streetcar, rather a streetcar could complement recommendations discussed in this chapter. However, follow-up studies will be needed as the plans for a streetcar become clearer to assess the impact and implications of various streetcar alignments on the recommendations in this plan.

Mode Share Goal

A traffic model was developed to assess existing and future traffic conditions in the study area. Mode share goals are imbedded in the future traffic forecasts. The model assumes a 20% reduction in vehicle trips. This reduction includes shifts in mode as a result of improvements to pedestrian, bicycle, and transit facilities and encouragement programs as discussed in this chapter. It also captures shifts in time of travel outside of the peak hour, shifts to routes outside of NoMA, or trips not made. These shifts are expected in NoMA as a result of the fact that demand is projected to exceed capacity on the major arterials, causing some drivers to choose to enter the roadway network at a time outside of peak hour, to choose a route outside of NoMA, to choose another mode of travel, or to not make the trip at all due to extreme congestion. This assumption is well documented in travel demand modeling research. This Plan recommends the formation of a Transportation Management Association (TMA). One of the first tasks of the TMA should be to establish more detailed mode share goals, developed and agreed upon by all members, for the NoMA neighborhood.

PHYSICAL RECOMMENDATIONS

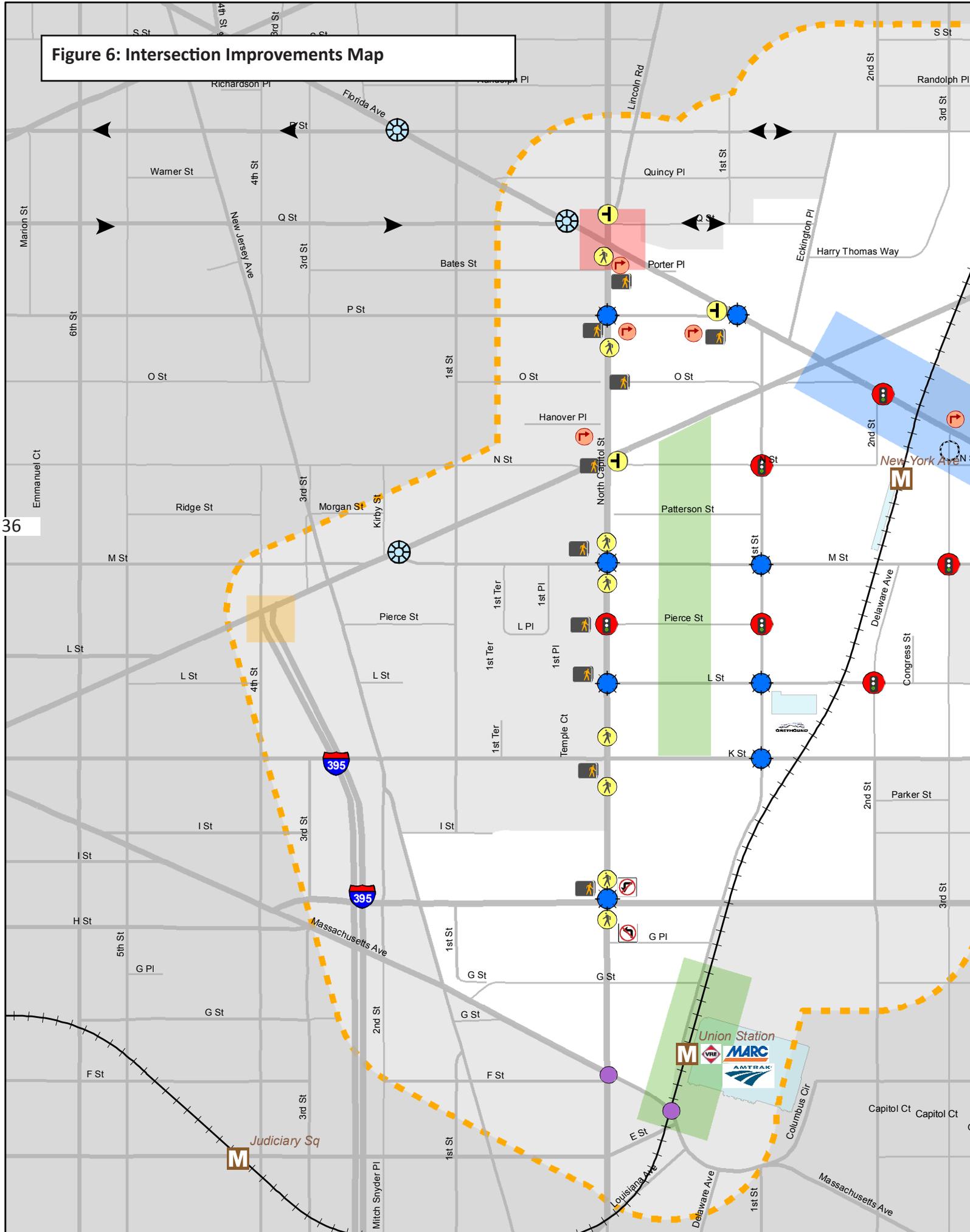
Recommendations for physical improvements in the NoMA neighborhood focus on achieving a balance between modes, while proactively managing congestion and mitigating potential conflicts between multi-modal users. The intent of these recommendations is to improve the level of service in the study area for all modes. The future multi-modal level of service (with and without improvements) is discussed following the recommendations.

RECOMMENDATION 1

Implement physical improvements to intersections throughout NoMA to ensure safety and access for all modes.

An interconnected network of roads, sidewalks, bikeways, and trails is needed in NoMA to provide people with convenient and comfortable transportation options. Intersections are a critical element of this network. The design and operation of intersections impacts the efficiency of motor vehicle travel, as well as the comfort and safety of pedestrian and bicycle travel. Figure 6 identifies recommended

Figure 6: Intersection Improvements Map



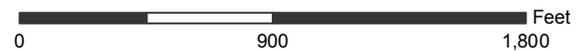
Intersection Recommendations

NoMa Neighborhood Access Study and Transportation Management Plan

-  Realign Intersection
-  Provide Pedestrian Crossing Island
-  Proposed New Signal
-  Pedestrian Hybrid Beacon
-  Upgrade Existing Signal
-  Proposed Leading Pedestrian Interval
-  Add Exclusive Pedestrian Phase
-  Prohibit Right Turn on Red
-  Prohibit Left Turns Full Time
-  Fill in Sidewalk Gap

-  Study Area
-  Proposed Pedestrian Priority Zone
-  Proposed Florida Ave. Road Diet and Sidewalk Widening (Shown as Figure 9)
-  Intersection Realignment (Shown as Figure 7)
-  4th St/I-395 Access (Shown as Figure 10)

Note: Proposed traffic signals may not meet warrants under current conditions. However, these recommended signal improvements are anticipated to meet warrants as development occurs and vehicle and traffic volumes increase. "Upgrade Existing Signal" may include adding a new signal phase (e.g. left-turn) and associated signal heads or it may include signaling new movements added by the two-way conversion.



Base Data Source: DC GIS

January 2010

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intersection improvements in the study area. They include traffic signal timing and operational changes, the addition of new sidewalks, and pedestrian crossing islands. Implementing the following actions will improve transportation conditions in the study area:

- *Action 1A: Provide pedestrian crossing islands at intersections to reduce pedestrian crossing distances and contribute to traffic calming. In locations with longer crossing distances (i.e., more than two lanes) and/or higher vehicle speeds, pedestrian crossing islands significantly improve pedestrian comfort and safety. In particular, pedestrian crossing islands have been shown to increase safety for pedestrians crossing multi-lane roadways at un-signalized crossings (Zegeer et al., February 2002).*

Several roads in the study area would benefit from pedestrian crossing islands. However, rights-of-way are limited and intersection space is at a premium. At a minimum, pedestrian crossing islands are recommended at the following locations:

- North Capitol Street at Florida Avenue
- North Capitol Street at P Street
- North Capitol Street at M Street
- North Capitol Street at K Street
- North Capitol Street at H Street

- *Action 1B: Create more compact intersections with right-angle crossings. This design minimizes pedestrian crossing distance and exposure to potential conflicts with vehicular traffic. It also improves driver safety by slowing turning vehicles and improving sight distances.*

Geometric improvements to create more compact intersections are recommended at the following locations:

- Florida Avenue/Lincoln Road/ Q Street/ North Capitol Street (shown as Figure 7)
- Florida Avenue/P Street
- North Capitol Street/New York Avenue
- Florida Avenue/N Street
- Florida Avenue/L Street
- K Street/ West Virginia Avenue

Figure 7 shows a proposed realignment of the intersection of Florida Avenue/North Capitol

Street/Q Street/Lincoln Place. The proposed improvement includes curb extensions to reduce crossing distances and slow turning vehicles, the expansion of existing medians to provide a greater refuge for pedestrians, and a realignment of Lincoln Avenue to route motor vehicle traffic onto North Capitol Street away from the intersection of North Capitol Street and Florida Avenue. This reduces potential conflicts between all modes.

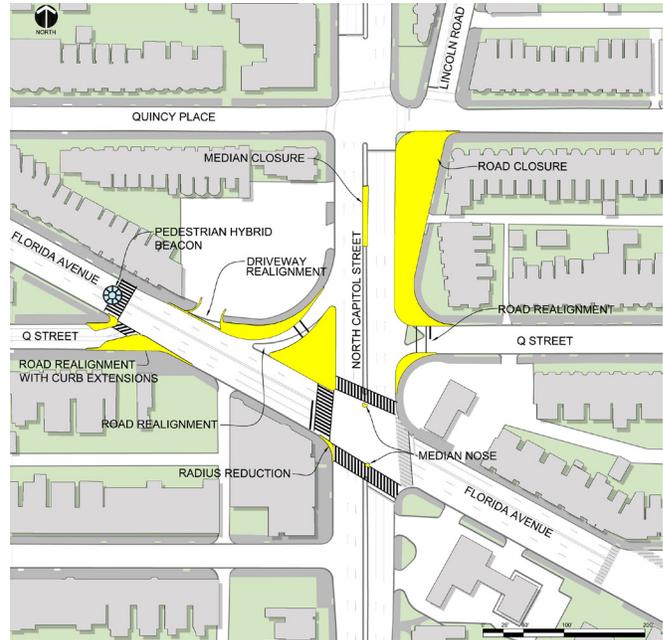


Figure 7: Sample Intersection Realignment

- *Action 1C: Prohibit left turns (full time) to reduce potential conflict points between oncoming motor vehicles and also between motor vehicles and pedestrians crossing in the crosswalk. Prohibiting left turns is recommended at the following location:*
 - North Capitol Street at H Street (NB, WB)
- *Action 1D: Alter lane configurations to maximize the operation and flow of motor vehicle traffic at intersections throughout the study area. Recommended lane configuration changes include creating additional through or turn lanes based on peak hour or full-time parking. The proposed changes reflect an approach known as Transportation System Management (TSM). TSM strategies seek to improve operations through more efficient use of the existing roadway network rather*

than providing additional physical capacity (e.g., additional width). Appendix C shows the existing lane configurations and proposed changes at specific intersections throughout the study area. Note that changes to lane configurations at intersections will require a reduction in on-street parking spaces. Lane configuration changes and other specific improvements along K, L, M, and First Streets are discussed in detail later in this chapter.

RECOMMENDATION 2

Provide improved facilities to allow pedestrians and bicyclists to travel along and cross roadways in NoMA comfortably and safely.

- *Action 2A: Develop a connected network of bicycle facilities* including cycle tracks, shared-use paths, bicycle lanes, and shared lane markings. On-road bicycle facilities serve several purposes, including designating roadway space for bicyclists, channelizing motor vehicles and bicyclists, indicating the proper direction for bicyclists to travel on the roadway, and indicating the correct position of riders at intersections. Shared use paths and cycle tracks, provide a space for bicyclists to be physically separated from roadway traffic.

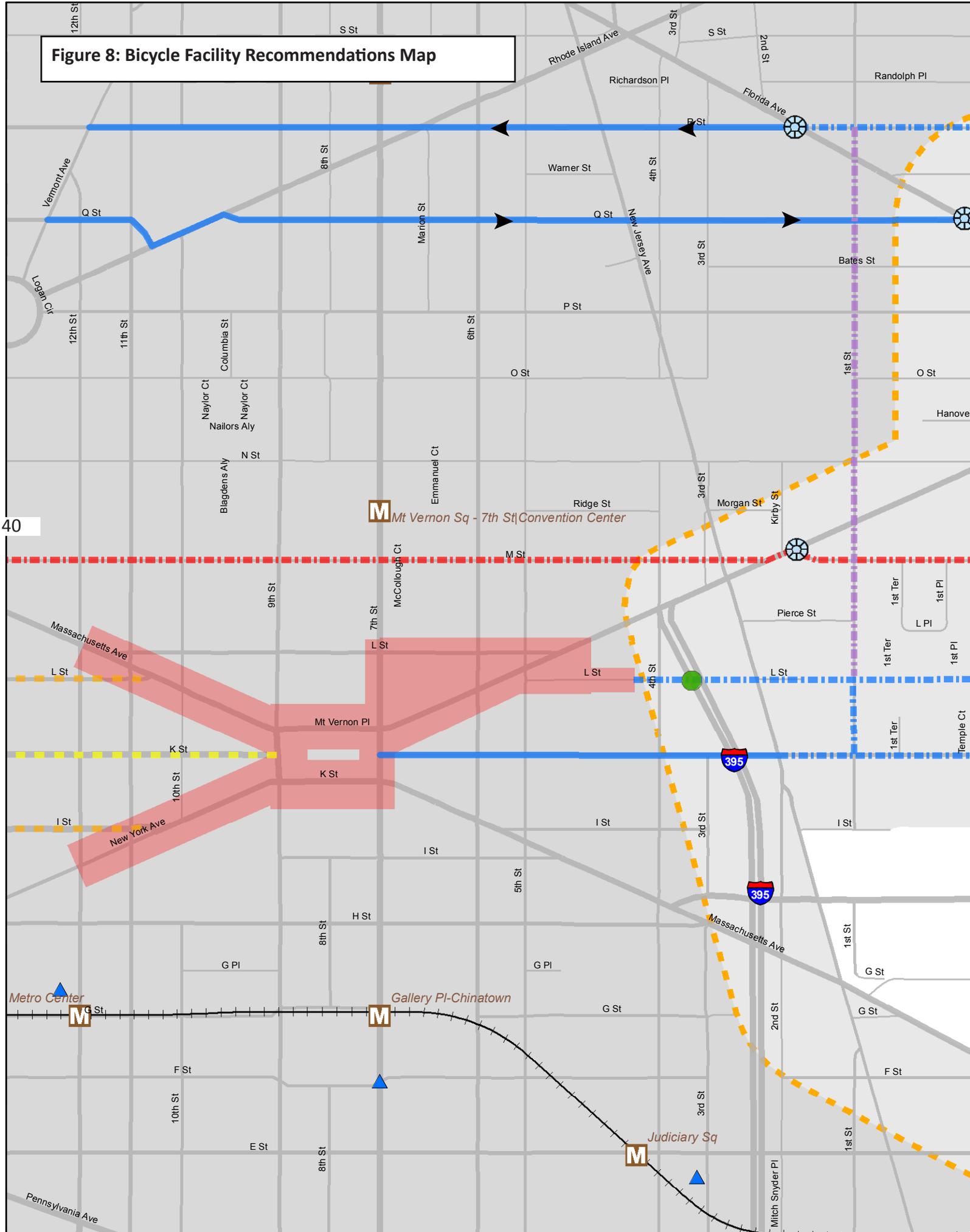
The specific type of facility recommended on each segment of the network depends on a wide range of factors, including surrounding land uses and connectivity to destinations, existing right-of-way space, the number of travel lanes, travel lane width, traffic volume and speed, traffic composition, and the presence of on-street parking.

Recommended bicycle facility types are described below. Figure 8 shows the recommended location for each facility type.

- Cycle tracks are one-way bikeways placed on each side of a roadway, physically separated from motor vehicle travel lanes by a barrier, on-street parking, or a combination of the two. Cycle tracks combine elements of bike lanes (one-way operation in the same direction as adjacent traffic), and paths (separation from traffic). They should be designated for exclusive bicycle use and should not be designed for shared use with pedestrians.

- Shared use paths provide a high-quality walking and bicycling experience in an environment that is separated from traffic. Shared-use paths should be a minimum of ten-feet wide and should be paved. These types of paths can be constructed within a roadway corridor, in their own corridor (such as a greenway trail or rail-trail), or be a combination of both.
- A bicycle lane is a portion of the roadway designated by striping and/or pavement markings for the use of bicyclists. The minimum width for a bicycle lane next to parked cars is five feet. Bicycle lanes include a bicycle pavement marking with an arrow to indicate that bicyclists should ride in the same direction as adjacent motor vehicle traffic.
- Shared lane markings (i.e., “sharrows”) are bicycle symbols that are placed within a vehicular travel lane of the roadway. Unlike bicycle lanes, they do not designate a particular part of the roadway for the exclusive use of bicyclists, but do indicate a preferred riding path for bicyclists and increase motorist awareness. The bicycle symbols used in shared lane markings include chevrons pointing in the direction of motor vehicle traffic to indicate that bicyclists should also ride in this direction. The recently released version of the Manual on Uniform Traffic Control Devices (MUTCD) includes shared lane markings as an approved treatment
- *Action 2B: Improve bike parking facilities* so that bicyclists have secure places to park their bicycles in NoMA. Bike parking should be improved at the New York Avenue Metrorail Station, and should be provided in parking garages and other locations throughout the study area, as discussed below.
 - Additional covered bicycle parking at the New York Avenue Metrorail station will encourage bicycling as a transportation mode in the study area. Covered bicycle parking, placed in locations that can be monitored by the station manager, is especially important at this location, as people need to be able to park their

Figure 8: Bicycle Facility Recommendations Map



Bicycle Facility Recommendations

NoMa Neighborhood Access Study and Transportation Management Plan

-  Existing Bike Racks and Lockers (Does not include racks on private facilities)
-  Existing Bike Station
-  Future Bike Station
-  Existing Smart Bike Location
-  Proposed Smart Bike Location
-  Planned MBT Ramp to L Street
-  Pedestrian Hybrid Beacon
-  Proposed Bike/Ped Bridge
-  Proposed Covered Bicycle Parking

-  Existing Bicycle Lane
-  Existing Shared Use Path
-  Planned Cycle Track
-  Planned Transit Way
-  Proposed Bicycle Lane or Cycle Track
-  Proposed Sidepath
-  Proposed Shared Lane Markings
-  Key Connection for Bicycle Continuity
-  Study Area

January 2010



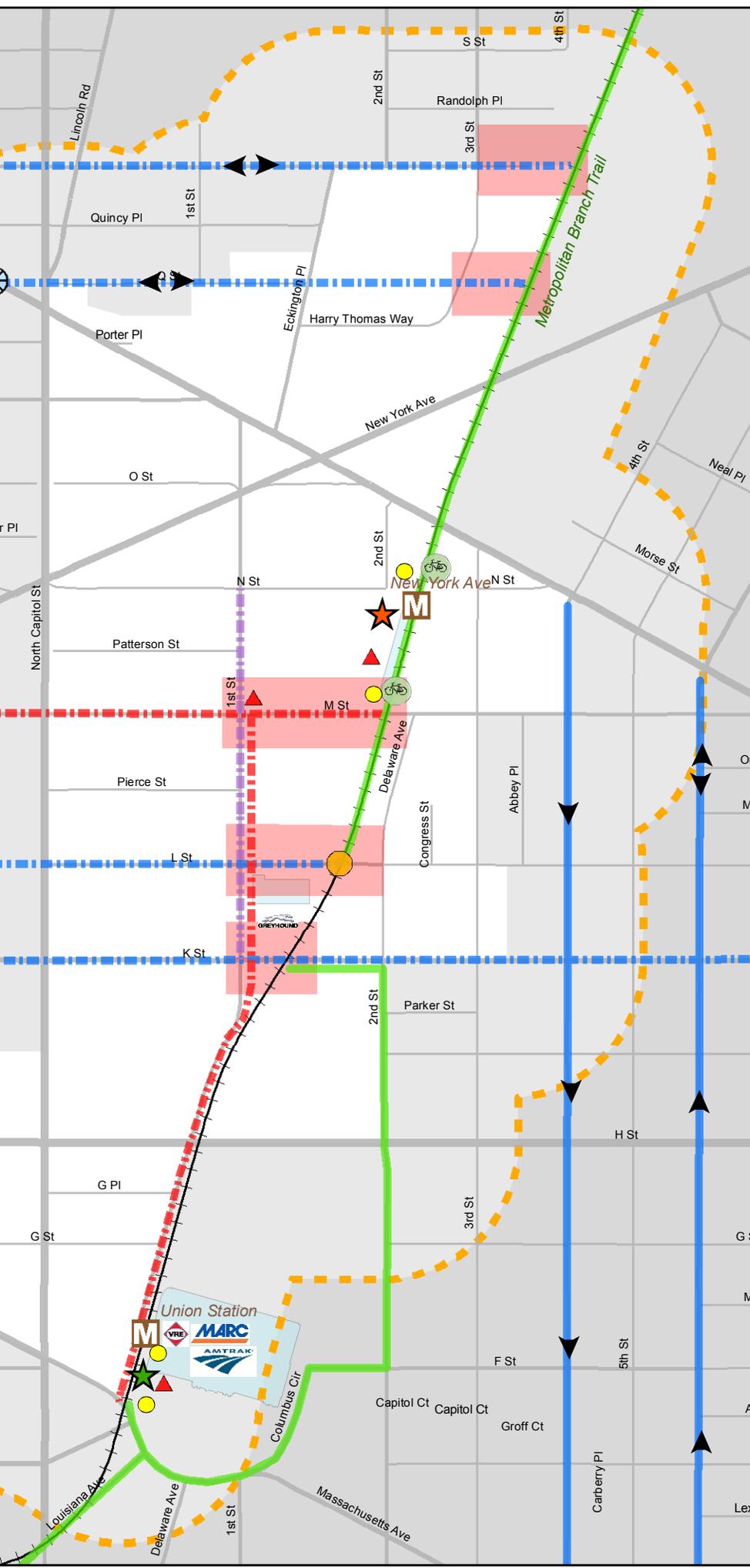
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bicycles for extended periods of time. The number of spaces to be provided will depend on a variety of factors, including the demand for covered parking and site-specific space limitations. Additional long-term storage such as bike lockers or bike cages with a reservation and payment system would be helpful as well, as they provide a higher level of security.

- Bike parking facilities in all existing and new parking garages will be an important source of bicycle parking facilities in the study area. Benefits of providing parking facilities in existing and planned garages include scattering parking throughout the study area, increasing its proximity to people's homes and offices. Additionally, it will provide a source for expanding parking supply, as new buildings are developed over time. A map should be produced (potentially by the TMA or the NoMA BID) highlighting the locations of all publicly accessible bike parking located in parking garages in NoMA.
- *Action 2C: Provide a new SmartBike location at the New York Avenue Metrorail Station.* The SmartBike program is a self-service public bike rental program. Each bike station consists of a rental kiosk and docking points for secure parking of bikes. The kiosk processes the rental of bikes and provides information for users. It also transmits the operational status of a specific location to an operations center and sends diagnostic information and alerts to the central server. A SmartBike location at the New York Avenue Station will provide residents and visitors with an additional way to travel around NoMA and to make connections between NoMA, Downtown, and other destinations. An additional SmartBike facility can be provided near the intersection of First Street, NE and M Street. Space for a SmartBike facility has been reserved and allocated at this location as part of the development process.
- *Action 2D: Fill gaps in the sidewalk network to ensure connected pedestrian travelways throughout the study area.* Most of the roads in the study area have sidewalks. Current and planned development is required to adhere

to streetscape and other pedestrian-related design standards. As a result, the pedestrian network will continue to improve as development occurs. The existing conditions analysis identified one roadway segment in need of sidewalk in-fill. A sidewalk gap should be filled at the following location:

- 3rd Street in between N Street and Florida Avenue
- *Action 2E: Designate selected streets in the study area as pedestrian priority zones (or woonerfs), as pedestrians are the majority of users in these locations.* Removing traditional traffic demarcations such as the separation between the street and the sidewalk (i.e., "curbless" streets) should be considered. Vehicle movement can be slowed on these streets by using unique pavements that make the street look more like a pedestrian plaza. Bollards, chicanes, and alternating parking bays can also help slow drivers. Trees, benches, and street furniture can be used to further enhance the street as a pedestrian zone shared with slow-moving cars. Streets that should be considered for a pedestrian priority designation include the following:
 - First Street in between Massachusetts Avenue and G Street. This section of First Street serves as a major outlet for pedestrians exiting Union Station and for many serves as the gateway to the NoMA neighborhood. This location may also serve as the terminus of a future streetcar line. A pedestrian priority design could support and reinforce the streetcar stop as a major pedestrian destination.



Pedestrian oriented street. Cambridge, Massachusetts.

- A midblock north/south pedestrian priority street could be created as part of planned development between First Street and North Capitol Street. This street could contribute to reconnecting the street grid, while providing more direct pedestrian connections. It could also provide neighborhood open space in an area where public open space is very limited. This pedestrian priority street was proposed in the *NoMA Vision Plan and Development Strategy*. Note that a pedestrian priority street would have to be created through final site designs as private sector development occurs. DDOT will likely have little regulatory control over the implementation of this recommendation and so it would have to be a developer led initiative.

The location of the recommended “pedestrian priority streets” are shown in Figure 6. The *NoMA Vision Plan and Development Strategy* identifies additional streets that should also be considered. Pedestrian priority streets are known by a variety of names, including curbless streets, shared streets, home zones, woonerfs (Dutch for living street), and Spielenstrasse (German for play-street). Pedestrian priority streets are used to severely discourage automobile traffic, but still allow for access to local land uses via car.

Regardless of the name, pedestrian priority streets share several characteristics:

- Shared space – pedestrian and automobile space is not separated on pedestrian priority streets. Rather, pedestrians are allowed use of the entire streets, and have priority over automobiles in all cases.
- Unique design treatments – because the operation of pedestrian priority streets is atypical, unique designs are used to highlight to both drivers and pedestrians that pedestrians have right-of-way. Designs include narrow travel-ways, textured pavement, and signs.
- Low speeds – speed limits on pedestrian priority streets may be as low as 5mph. Note that street-design typically controls travel speeds rather than rely on enforcement (i.e., it does not feel comfortable to drive faster than 5mph on pedestrian priority streets).

- Pedestrian amenities – pedestrian priority streets include amenities to make walking along and stopping in the street a pleasant pedestrian experience. Amenities may include trees, flowers, benches, tables, and/or children play areas.

Oftentimes, pedestrian priority streets include both pedestrian-only space along the sides of the street as well as shared-space in the center. There are typically no curbs to delineate these zones, however. Instead, pedestrian priority streets rely on bollards and/or pavement changes (e.g., texture, color, etc.) to identify different zones.

There are many successful examples of pedestrian priority streets throughout the United States and Europe.

- *Action 2F: Implement a lane reduction on Florida Avenue* to provide additional space for widening the sidewalk on the south side of Florida Avenue under the CSX tracks. The lane reduction and sidewalk widening on Florida Avenue is recommended from 2nd Street, NE to 6th Street, NE. This is shown in Figure 9 on the following page. This section of Florida Avenue is near Oyster Elementary School and is along the pedestrian travelway between Gallaudet University and the New York Avenue Metrorail Station. The lane reduction project supports recommendations included in the Oyster Elementary School Safe Routes to School plan.

RECOMMENDATION 3

Implement traffic signal-related changes to improve conditions for all modes at intersections throughout the study area.

A series of signal improvements were identified to improve conditions at intersections throughout the study area. These recommendations are highlighted in Figure 6 and discussed in more detail below:

- *Action 3A: Provide new traffic signals* to manage the flow of traffic and allow pedestrians to cross streets without having to dash through a gap in moving traffic. It is important to reduce conflicts between pedestrians and bicyclists and turning vehicles where possible. New traffic signals

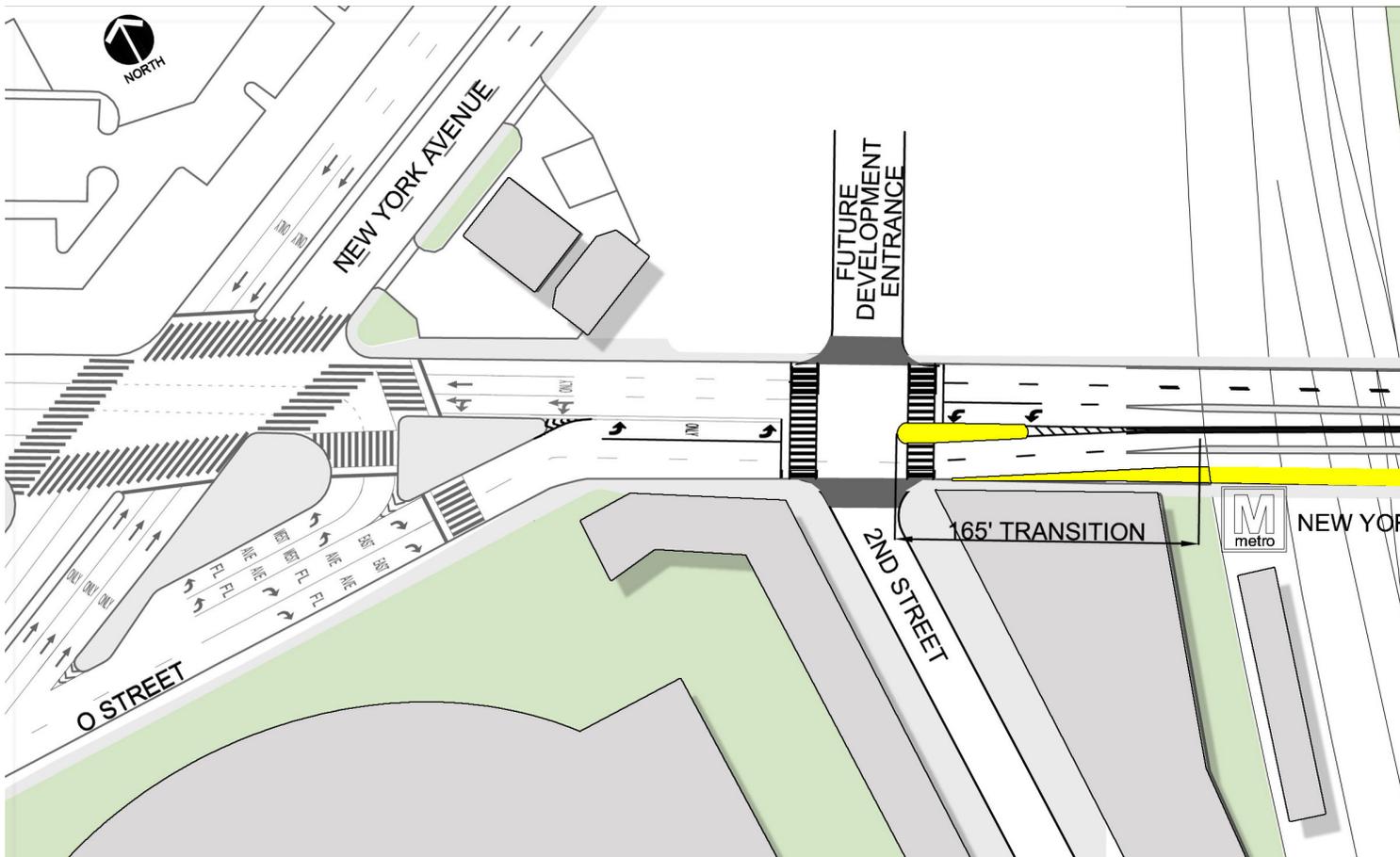
are recommended at the following locations:

- 1st Street NE and N Street NE (including east, west and southbound left-turn phasing)
- 1st Street at Pierce Street, NE (including northbound left-turn phasing)
- 3rd Street at M Street NE (including eastbound left-turn phasing)
- North Capitol Street and Pierce Street
- Florida Avenue and 2nd Street
- L Street and 2nd Street

It is anticipated that these locations will meet the warrants in the MUTCD, however a signal warrant analysis will be needed.

- **Action 3B: Upgrade Existing Signal** to improve the efficiency of existing signal operations and reduce vehicle and pedestrian delay. Revised signal phasing (in the manner noted below) is recommended at the following locations:
 - 1st at L Street, NE – implement east and westbound left-turn phasing
 - 1st and K Street NE – implement east and westbound left-turn phasing

- Florida Avenue at P Street – implement westbound left-turn phasing
- North Capitol at P Street – double cycle (lead and lag) the existing southbound left-turn phase
- North Capitol Street/ M Street - install signal heads to accommodate two-way traffic on M Street between North Capitol Street and 1st Street
- 1st Street/ M Street - install signal heads to accommodate two way traffic on M Street between North Capitol Street and 1st Street
- North Capitol Street/ H Street -in the PM and off peak, change the SB North Capitol Street approach lane configuration to a through/ right, through and left turn only lane. During the AM peak hour a right turn lane and two through lanes remain; SB left turns remain prohibited. This would require variable lane control signage and modification to the traffic signal to accommodate a protected SB left turn phase.



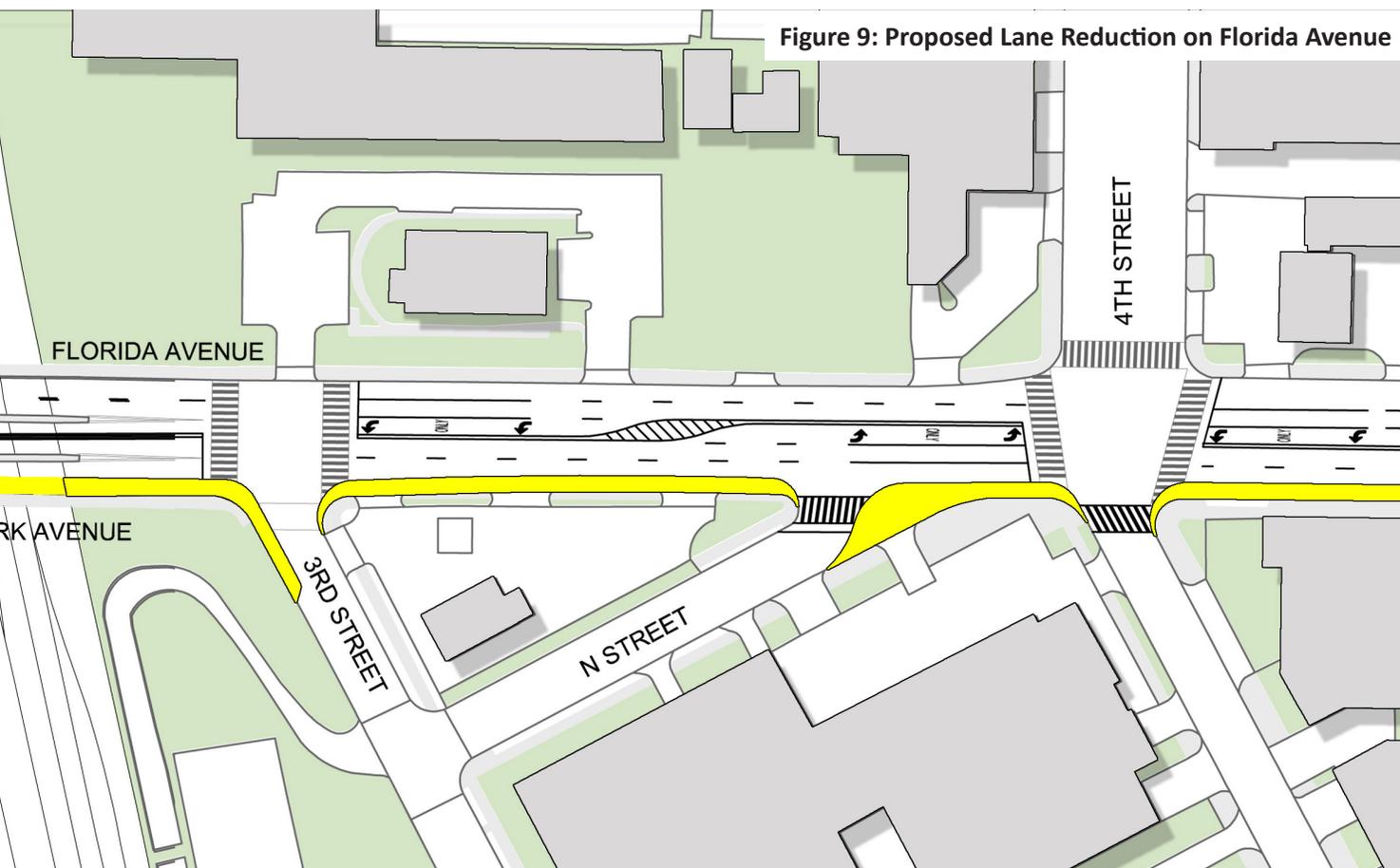
- *Action 3C: Prohibit right turns on red (RTOR)* to reduce instances where motorists roll through the stop (especially at intersections with wide turning radii) and focus only on the traffic approaching from their left rather than pedestrians who may be preparing to cross. In addition, drivers often pull into the crosswalk to wait for a gap in traffic, blocking the path of pedestrians and putting them at risk of being struck by the vehicle. RTOR restrictions should be used in locations with high pedestrian volumes. It may be desirable to test right turn restrictions for 3 to 6 months and evaluate its impacts on all travel modes. It may also be possible to apply the restriction only during certain times of day with more pedestrian activity, such as 7 a.m. to 7 p.m.

RTOR restrictions are proposed at the following intersections:

- 3rd Street at N Street
- North Capitol Street at New York Avenue
- North Capitol Street at P Street
- Florida Avenue at P Street
- North Capitol Street at Florida Avenue
- Florida Avenue at 3rd Street NE (northbound approach only, due to poor sight distance through CSX underpass)

- *Action 3D: Provide Leading Pedestrian Intervals (LPI)* to give pedestrians a head start at intersections with a turning movement that conflicts with the pedestrian phase. This low-cost treatment gives pedestrians enough time to move into the curbside travel lane before automobiles are provided with a green signal indication. LPIs increase the visibility of pedestrians to drivers prior to the green signal phase, increasing the likelihood that right and left-turning drivers will yield to pedestrians when they receive a green signal indication. Because the LPI is implemented through the traffic signal controller, it is also possible to use the LPI only during certain times of the day, such as between 7 a.m. and 7 p.m., or whenever the highest numbers of pedestrians or turning vehicles are typically present.

A study of a three-second leading pedestrian intervals (LPI) found that the LPI decreased conflicts between turning motor vehicles and increased the percentage of motorists that yielded to pedestrians in the crosswalk.



Leading Pedestrian Intervals should be studied further for implementation at the following locations:

- North Capitol at Florida Avenue
 - North Capitol at P Street
 - North Capitol at H Street
 - Florida Avenue at P Street
 - New York at North Capitol Street
 - North Capitol Street/ O Street
 - North Capitol Street/ M Street
 - North Capitol Street/ Pierce Street
 - North Capitol Street/ L Street
 - North Capitol Street/ K Street
- *Action 3E: Add an exclusive pedestrian phase (scramble phase) at selected intersections where pedestrian activity is heavy. An exclusive phase will allow pedestrians to cross the intersection either diagonally or conventionally. Allowing diagonal pedestrian crossings reduces the overall wait time for multi-stage conventional crossings at a single intersection. Exclusive pedestrian phases can also improve automobile operations at locations with high right-turning vehicle volumes by eliminating pedestrian-induced delay for right-turning vehicles.*

Research suggests that at intersections with greater than 1,200 pedestrians per day, exclusive pedestrian phases can help improve pedestrian safety. In the NoMA neighborhood, exclusive pedestrian phases should be considered at two intersections:

- Massachusetts Avenue at North Capitol Street
- Massachusetts Avenue at 1st Street NE

These two locations have some of the highest pedestrian volumes in the study area and include multi-stage crossings that may benefit from an exclusive pedestrian phase. For example, in order to walk to and from Union Station on Massachusetts Avenue, pedestrians can cross 1st Street NE only on the north side of the street. Similarly, no crosswalk is provided across Massachusetts Avenue on the east side of 1st Street NE. Currently, pedestrians headed south or east must cross multiple legs of the same intersection to reach their destination. Providing an exclusive pedestrian

phase at this intersection would significantly reduce pedestrian delay. Additional analysis and evaluation of delay, impact on LOS for all modes, and impact on operations with the new Columbus Circle traffic plans will be needed prior to implementation. The intersections noted above could be considered as pilot locations (with detailed before and after studies) for the implementation of the scramble phase.

- *Action 3F: Provide Pedestrian Hybrid Beacon signals at selected locations to improve crossing opportunities along major east/west routes in the study area. Pedestrian Hybrid Beacon signals provide a dark (i.e., unlit) traffic signal for traffic on the major street until activated by a pedestrian or bicyclist. When the push-button is activated, the signal turns to yellow, followed by a solid red phase, similar to a standard traffic signal. When traffic on the major street receives the red signal, the pedestrian signal provides a WALK indication for pedestrians. After the pedestrian begins to cross and the FLASH DON'T WALK indication starts, drivers are given a flashing red signal that allows the drivers to proceed (after stopping) as soon as the pedestrian clears the crosswalk and conditions are safe. The MUTCD includes Pedestrian Hybrid Beacon signals as an approved treatment.*

Pedestrian Hybrid Beacon signals should be considered at the following locations:

- Intersection of Florida Avenue and R Street to improve east/west connections while enhancing access to and from the Metropolitan Branch Trail.
- Intersection of Florida Avenue and Q Street to improve east/west connections while enhancing access to and from the Metropolitan Branch Trail.
- Intersection of M Street and New York Avenue to address a significant potential barrier to a proposed side path that would connect the Metropolitan Branch Trail to Georgetown.

RECOMMENDATION 4

Enhance the street grid, provide alternative access routes, and implement one-way/two-way traffic conversions.

Enhancements to the street grid, alternative access routes, and one-way/two-way traffic conversions are recommended with the goal of distributing traffic over NoMA's roadway network more evenly. This will improve pedestrian and bicycle mobility as well. Implementing the following actions can improve transportation conditions in the study area:

- *Action 4A: Enhance the street grid, provide alternative access routes, and implement one-way/ two-way traffic conversions* to improve access and circulation throughout the study area. These improvements are noted below and shown in Figure 11.
 - Convert New Jersey Avenue to 2-way from I Street to New York Avenue in coordination with the Return to L'Enfant development: The advantages of this conversion would be to provide a new connection southbound from New York Avenue to Massachusetts Avenue. This option would reduce the traffic load on several adjacent streets including New York Avenue, K Street and North Capitol Street, which would reduce travel times and delays on those streets. In addition, this also provides an option to extend L Street west to New Jersey Avenue and further strengthen the grid network.
 - Convert 4th Street NW between K Street and New York Avenue to 2-way traffic operations, to allow motorists to access I-395 SB without using New York Avenue: The advantage of this conversion is to allow traffic from NoMA to head to points south in Northern Virginia and Southern Maryland via I-395 without using New York Avenue, thus reducing the impact of future development projects and generated traffic within NoMA on New York Avenue.



Figure 10: Proposed access to I-395 via 4th Street

- Convert M Street to two-way traffic operations between North Capitol Street and First Street, NE and between 4th Street, NE and Florida Avenue: The advantage of this conversion is to allow for a more even distribution of traffic entering and exiting future developments and future parking garages in NoMA, reducing the volume of turning movements at intersections along M, 1st, North Capitol, Pierce and L Streets.
- Convert O Street west of New York Avenue to one-way westbound to reduce the number of signal phases required at New York Avenue and 1st Street NE. Alternative access for O Street EB may be achieved via P Street: The traffic volumes exiting O Street are relatively minor compared to those on New York Avenue or 1st Street, and preliminary assessment indicates other routing may be possible for reassigning the EB O Street movement, however the impact of the additional phase of the signal cycle including clearance time, start-up delay and loss of time for other vehicle and pedestrian phases along 1st and New York Avenue is significant when compounded throughout a peak hour. This traffic flow change would simplify the traffic signal phasing at a critical intersection along New York Avenue, and a key access point for NoMA, reducing conflicts for vehicles and pedestrians, and reducing delay and travel times.
- Extend L Street from North Capitol Street to New Jersey Avenue in coordination

with the Northwest One redevelopment project, and ultimately across I-395 via a pedestrian and bicycle bridge in coordination with the Return to L'Enfant development. A pedestrian and bike bridge, as shown below, could provide a connection over I-395 and serve as a gateway to NoMA from downtown Washington, DC. The extension of L Street for vehicles west to New Jersey Avenue, and for pedestrians and bicyclists west of I-395 provides a major strengthening of the grid network and enhances neighborhood connectivity between Northwest One, NoMA, and Near Northeast.



Pedestrian and bicycle bridge. Victoria, British Columbia

One major advantage of this roadway extension is to allow for L Street to become part of a one-way couplet with K Street. A one-way couplet system from Florida Avenue to New Jersey Avenue would provide additional capacity for vehicles and parking, reduce conflicts and crossing distances at intersections for pedestrians and bicyclists, while providing maximum flexibility to develop a streetscape and roadway section that is complete, multi-modal and green.

- In the immediate term, L Street should be converted to two way in between North Capitol Street and First Street, NE to increase access and connectivity to and from NoMA.
- Extend 2nd Street from Florida Avenue to New York Avenue, with a right-in/right-out only condition at New York Avenue, in coordination with the Washington Gateway project: The advantage of this route designation is to allow future traffic to and from NoMA to head to points

east without using portions of New York Avenue and Florida Avenue, thus reducing the impact of future development projects and generated traffic within NoMA on New York Avenue.

- Convert Pierce and Patterson Streets to two way in between North Capitol Street and First Street, NE to increase access to and from NoMA.

RECOMMENDATION 5

Improve transit operations in the study area.

Existing transit routes extend along arterials in NoMA, including North Capitol Street, H Street, and Florida Avenue. Transit service on these routes is frequent, contributing to more than 24,500 daily boardings and alightings at bus stops in NoMA every day. However, large areas of NoMA are not directly served by transit service. For example, First Street does not currently have transit service, despite being planned as NoMA's "Main Street".

Implementing the following actions will improve transit conditions in the study area:

- *Action 5A: Implement an extension to the existing DC Circulator system to include NoMA:* While NoMA is adjacent to Union Station and served by several WMATA bus routes, these services are not oriented toward local access within NoMA. Transit service with a focus on serving NoMA and providing convenient access to rail service are necessary to meet the significant demand that will be generated by new development in NoMA. In particular, transit service on First Street, NE in NoMA will support retail and commercial destinations along this corridor.

In addition, a circulator route through NoMA, particularly one that provides access to Union Station, has the potential to provide cost savings to private businesses currently running employee shuttles (NoMA One and Sirius XM) by replacing the existing private shuttle routes. Towards this end, current shuttle operators should be approached and public private partnerships should be considered. This could be accomplished by shifting funding currently dedicated to private

shuttles to a publicly available shuttle system in NoMA.

The DC Circulator system should be extended to serve NoMA, either through an extension of the existing DC Circulator Navy Route or a new Circulator route. As shown in Figure 12, the route will be oriented to provide north-south service through the neighborhood from Union Station to the north side of the Florida Avenue/New York Avenue intersection. Major stops will include Union Station and the New York Avenue Metro Station, with additional stops spaced roughly every 2 to 3 blocks. A possible future extension of this line could serve Gallaudet University. A seamless connection to bus and street car routes on H Street should also be provided.

- *Action 5B: Relocate the existing bus stop near the intersection of Massachusetts Avenue and North Capitol Street:* The existing near-side bus stop on westbound Massachusetts Avenue at North Capitol Street has experienced safety issues due to the mix of pedestrians, transit, and motor vehicles. Currently, buses stop in the westbound curbside lane, at the stop bar, to drop off and pick up passengers. Westbound right-turning vehicles often attempt to turn in front of stopped buses to avoid waiting until the bus has cleared the intersection to turn. This creates potential conflicts between turning vehicles and departing buses. Additionally, stopped buses limit the sight distance for right-turning drivers, making it difficult for them to see pedestrians crossing North Capitol Street.

To address these issues, consideration should be given to relocating the bus stop to the far side of the Massachusetts Avenue/1st Street NE intersection. This may impact some of the existing curbside parking on the north side of Massachusetts Avenue, but would provide safety benefits over the existing stop location.

RECOMMENDATION 6

Improve connections to the Metropolitan Branch Trail.

Existing and planned sections of the Metropolitan Branch Trail extend through the heart of the NoMA neighborhood, roughly paralleling the WMATA Red

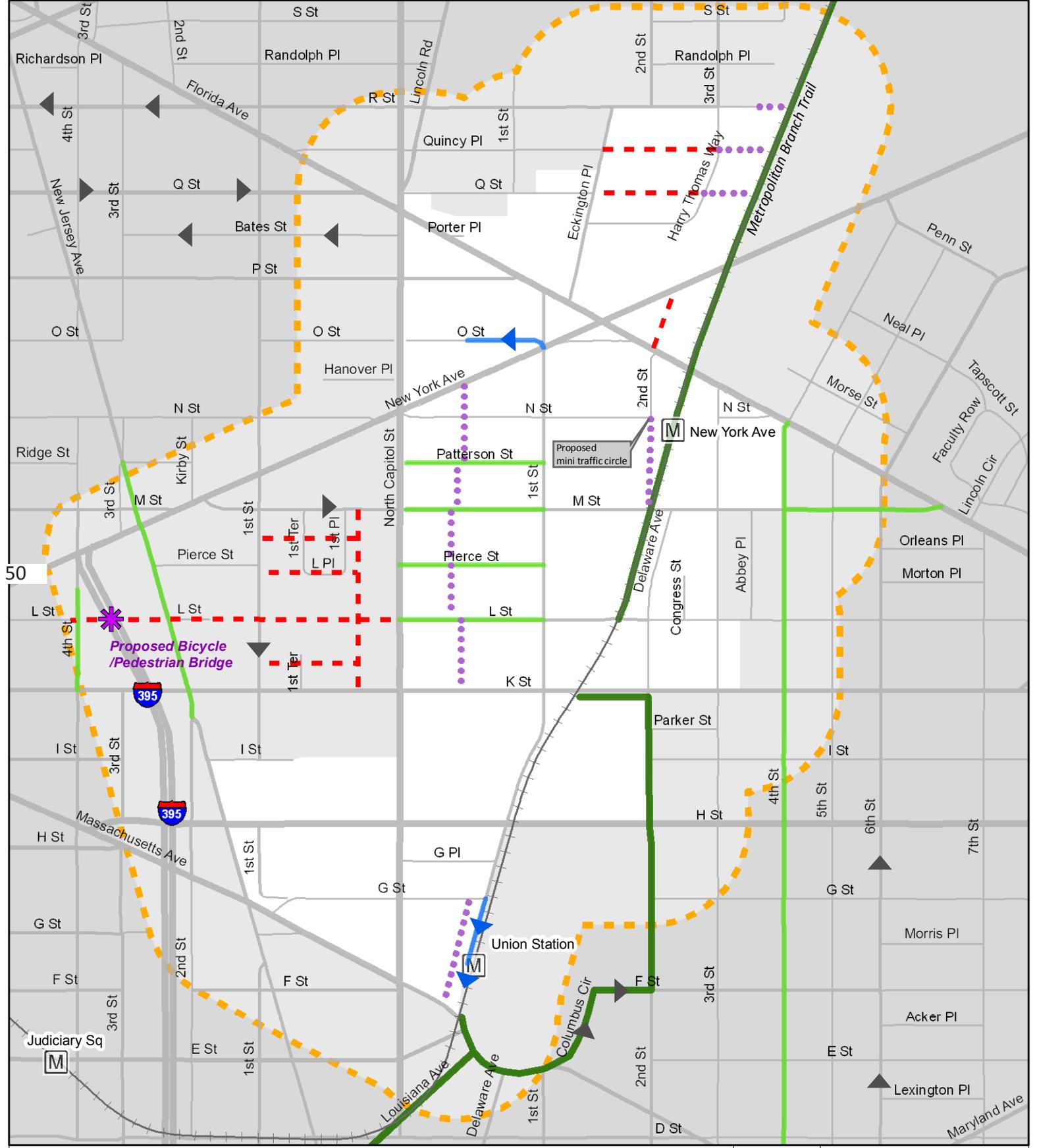
Line. Many of the recommendations discussed above will improve connections to the Metropolitan Branch Trail. For example, providing Pedestrian Hybrid Beacon signals at the intersections of Florida Avenue and Q and R Street and providing improved bike parking at the New York Avenue Station will improve conditions for existing users of the trail and encourage new users.

Additional recommendations specific to the Metropolitan Branch Trail include the following:

- *Action 6A: Extend on-road bicycle routes on R Street and Q Street to meet the Metropolitan Branch Trail.* Q Street currently terminates at Eckington Place and R Street terminates at 3rd Street, NE. As part of new development in the vicinity (roughly between Eckington Place and the railroad tracks), bicycle access should be provided to enable bicyclists coming to and from the trail to directly access bike lanes on Q Street, R Street, and Eckington Place. These trail access connections are shown in Figure 8.
- *Action 6B: Plan and design the segment of L Street in between First Street and the railroad tracks* to link the Metropolitan Branch Trail to a future shared use path on First Street, providing a connection to the Union Station Bike Station. Future plans call for the Metropolitan Branch Trail to ramp down to street level just north of L Street. When this occurs, the section of L Street between the tracks and First Street will become especially important as the primary link between the trail and the Bike Station. Private development in the vicinity should be encouraged to contribute to this connection, for example through streetscape and frontage design, or by preserving space for a dedicated shared use path.



Shared use path in an urban setting. Montreal, Canada



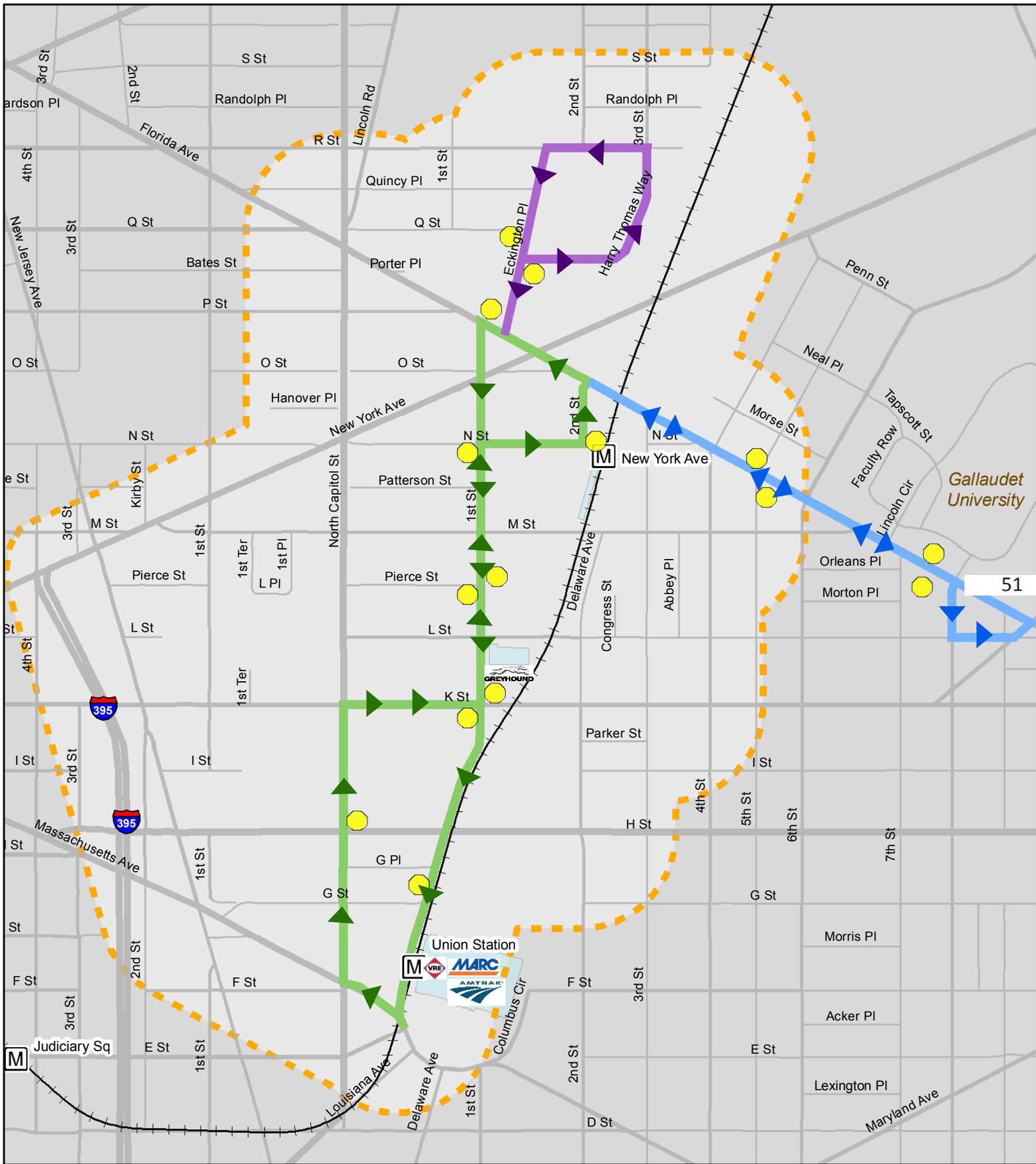
Travel Direction Changes, Roadway Extensions and Other Improvements **Figure 11**

Legend		Recommendations	
Metrorail Station	Two Way to One Way	New Pedestrian Priority Street	
Metrorail Red Line	One Way to Two Way	New Road	
Study Area	Existing One Way Travel Direction		
Existing Shared Use Path			

0 500 1,000 Feet

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Proposed NoMa Circulator Routes Figure 12



Legend	
	Metrorail Station
	Metrorail Red Line
	Study Area
	Circulator Stops
	NoMa Circulator East Loop
	NoMa Circulator North Loop
	NoMa Circulator Main Loop

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RECOMMENDATION 7

Pursue key corridor recommendations.

M, K, L, and First Streets form the core of the NoMA roadway network and primarily serve NoMA traffic. The recommendations for these roadways are meant to improve mobility, livability, and multi-modal goals discussed in this Plan. The recommended alternative for each priority corridor is discussed briefly below. A more detailed discussion of each of the corridors and extensive design recommendations are provided in Appendix B.

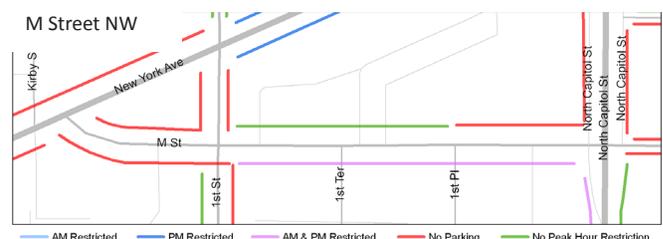
M Street: A cycle track is recommended on the south side of M Street in the long term. In the near term, converting M Street to two-way between North Capitol Street and M Street, NE and between 4th Street, NE and Florida Avenue is recommended. The addition of a Pedestrian Hybrid Beacon at New York Avenue, raised crosswalks, LPI's, a new Smart Bike location, and covered and secure bike parking at the New York Avenue Metro Station are also recommended. The proposed cross sections for M Street are shown on Page 54.

K Street and L Street: Implementing a “one-way pair” on K and L Streets should be considered. This would require converting L Street to one way westbound from West Virginia to 1st Street NW and converting K Street to one way eastbound within the same limits. A cycle track on either K or L Street and an extension of L Street over the I-395 interchange could be completed in tandem with this change. The proposed cross sections for K Street and L Street are shown beginning on Page 55. In the near-term, a lane reduction and bike lanes are recommended on K Street to extend a similar improvement to the west of the study area.

First Street: In the long-term a continuous shared use path on First Street is recommended connecting the Metropolitan Branch Trail and Union Station. In addition to lane configuration, parking, and traffic signal-related changes, a pedestrian priority curbless street on First Street outside of Union Station is also recommended.

The recommendations noted above are discussed in detail on the following pages.

RECOMMENDED ON-STREET PARKING



M STREET

UNDERLYING GOALS

Provide a continuous and direct off-road bicycle facility linking the Metropolitan Branch Trail to Georgetown.

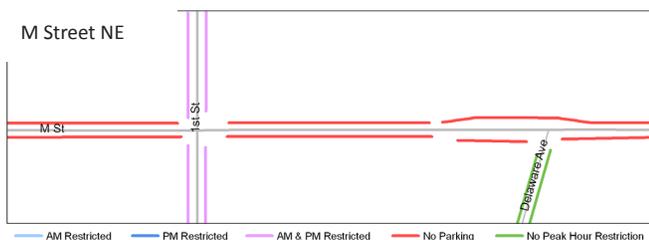
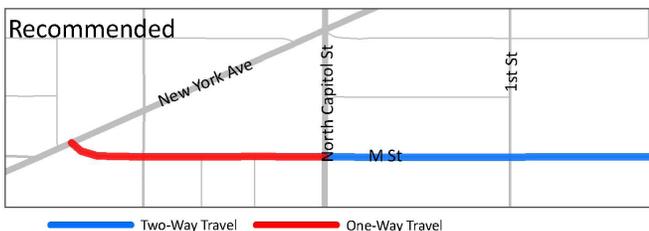
Increase access and circulation in NoMA by changing the segment of M Street between North Capitol Street and First Street and between 4th Street and Florida Avenue from one-way to two-way operations.

Retain sufficient on-street parking where possible to support neighborhood residential uses.

Provide a range of other improvements to enhance multimodal conditions along the M Street corridor.

SHORT-TERM ONE-WAY TO TWO-WAY CONVERSIONS

The graphic below shows the recommended change of M Street in between North Capitol Street and First Street from one-way travel to two-way travel. The section between 4th Street, NE and Florida Avenue should also be converted to two-way operations.



LONG-TERM FACILITY RECOMMENDATION

Key corridor: M Street

Extent: From the New York Avenue Metrorail Station to the westernmost edge of the study area (and continuing west).

Facility: Cycle track.

Implementation: In the long-term, add a cycle track on the south side of M Street from the New York Avenue Metrorail Station to the westernmost edge of the study area (and eventually continuing to Georgetown); Eliminate on-street parking on one side of the street and implement other on-street parking restrictions to accommodate the proposed cycle track.

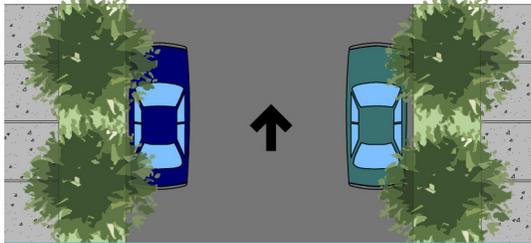
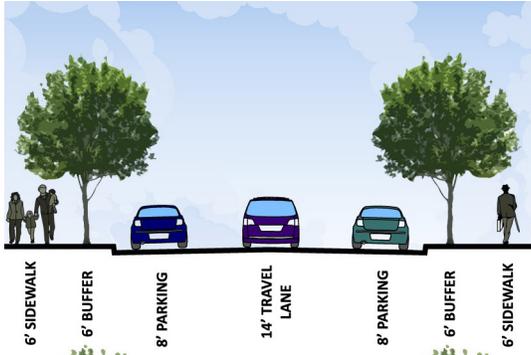
Note that this alternative would further degrade traffic operations at the intersection of North Capitol Street and M Street (projected to be a LOS "F" in both peaks). However, the impact to traffic operations would be more bearable if the M Street bicycle enhancements were implemented along with the two-way conversion of New Jersey Avenue and the K and L Street one-way couplet, as these improvements would give motorists from New York Avenue and I-395 more options to reach NB North Capitol Street.

ADDITIONAL RECOMMENDATIONS

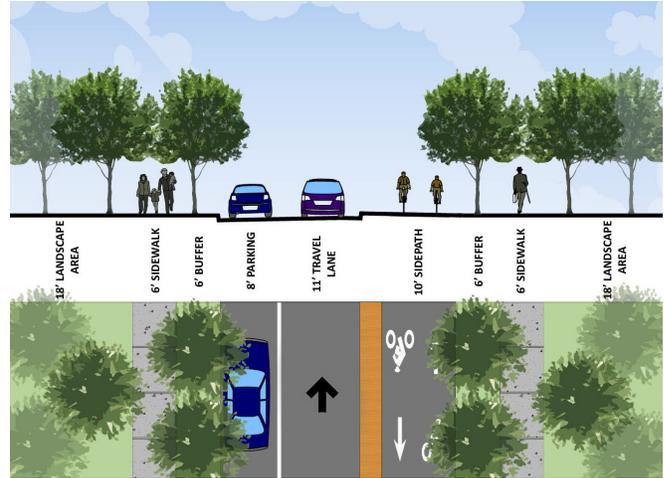
1. Identify locations for potential raised crosswalks on the corridor.
2. Add a Smart Bike location at the New York Avenue Metrorail Station and near the intersection of First Street, NE and M Street.
3. Add Leading Pedestrian Intervals throughout the corridor.
4. Add a cycle track on the south side of M Street.
5. Add a pedestrian beacon signal at the intersection of M Street and New York Avenue.



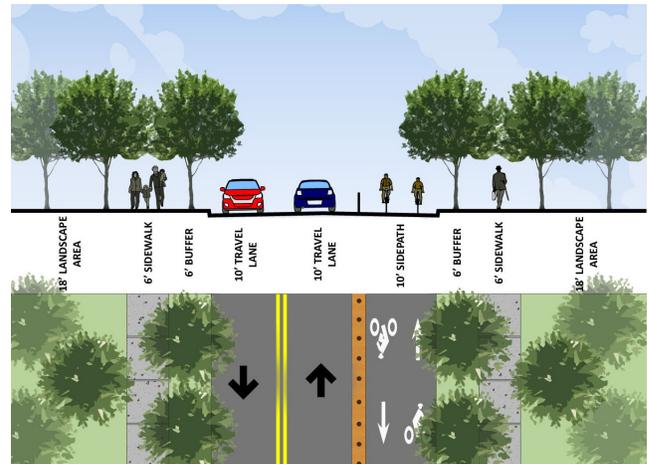
Figure 13: M Street Recommendations



M STREET EXISTING CROSS SECTION



M STREET PROPOSED CROSS SECTION: ONE-WAY SECTION



M STREET PROPOSED CROSS SECTION: TWO-WAY SECTION

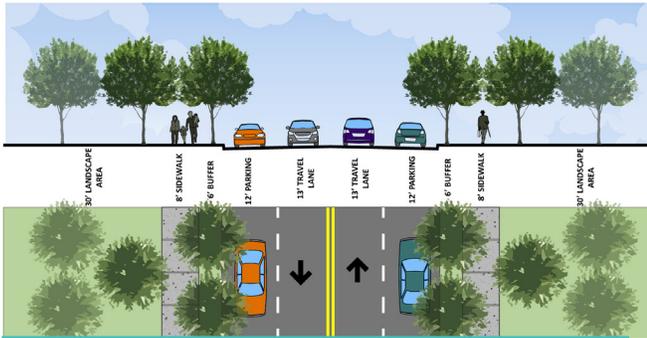


Photo: James Mackey



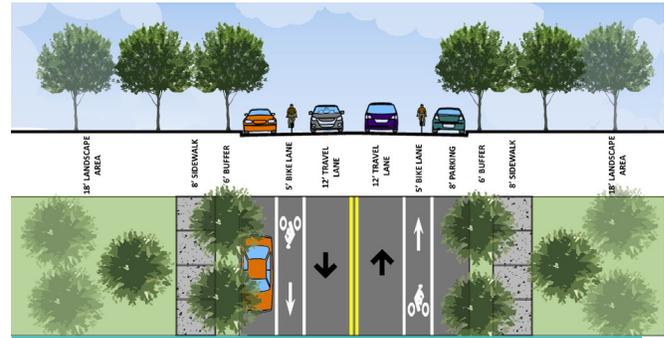
K STREET

Figure 14: K Street Recommendations



K STREET EXISTING CROSS SECTION

K Street is an important east/west route providing access to and from NoMA. Near the study area, K Street has one travel lane in each direction and on-street parking is provided on both sides of the street. There are sidewalks on both sides of the street.

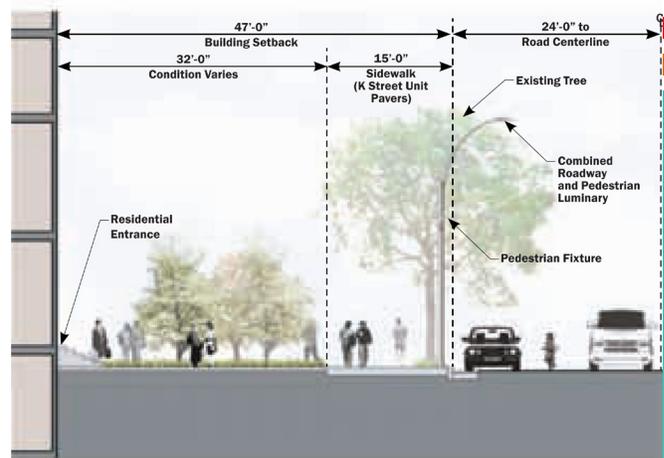


PROPOSED K STREET ROAD DIET

K STREET ROAD DIET

A lane reduction, or “road diet,” should be considered on K Street to improve conditions in the near to medium term. DDOT is currently implementing a road diet and installing bike lanes on K Street west of the study area in the Mount Vernon Triangle area. The 2006 Mount Vernon Triangle “Transportation and Public Realm Design Project” proposes a road diet on K Street starting at 7th Street, NW heading east. In addition to travelway modifications, the plan includes several design elements that should be continued all the way to First Street, NE in the near term.

By narrowing the motor vehicle travel lanes, roadway space would be reallocated to provide bicycle lanes in both directions. The existing rush hour parking restrictions would be lifted to allow full-time parking on both sides of the road. In addition, left turn lanes will be added at each intersection using space created by restricting parking on the approach to the intersection on the curb adjacent to the left turn lane. Alternatively, roadway operations could be improved and parking spaces preserved by adding a continuous center turn lane along the corridor. However, this modification would require a 6-foot road widening.



Section through K Street from Mount Vernon Triangle “Transportation and Public Realm Design Project” (DDOT, 2006). Full cross-section would mirror the illustration.

ROAD DIET CONSIDERATIONS

Implementing a road diet on K Street would provide an east/west bicycle connection to and from NoMA in the short term, which was identified as a critical need in this study. This would also provide other benefits such as making the existing on-street parking permanent, rather than rush hour restricted. However, if motor vehicle traffic increases as projected, the lane reduction will become untenable at some point in the future. Additional study will be needed to determine the timing and ultimate vehicle LOS of the narrowed roadway.

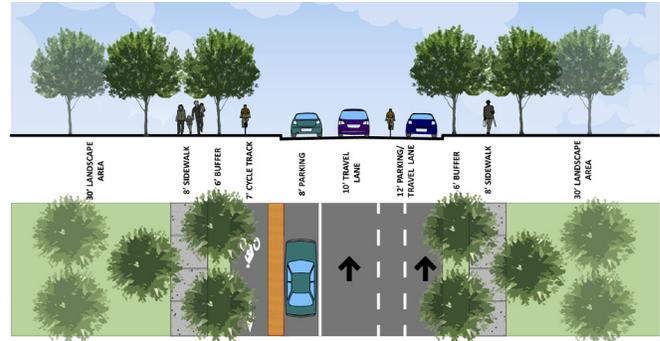
ONE-WAY PAIR

When traffic conditions worsen, and more significant road improvement becomes necessary, a “one-way pair” on K and L Streets should be considered. As Figure 15 on page 57 illustrates, this would entail converting L Street to one way westbound from West Virginia to 1st Street, NW and converting K Street to one way eastbound within the same limits. A cycle track on either K or L Street and an extension of L Street over the I-395 interchange could be completed in tandem with this change. This reconfiguration could not occur until L Street is extended, and would require more detailed analysis and an extensive public outreach component.

The east-west, one-way couplet system was developed as an alternative for K Street and L Street in an effort to provide on-street parking, turn lanes, and bicycle lanes, while improving vehicular mobility. As noted, under this scenario, L Street would be converted to one-way westbound operation and K Street would be converted to one-way eastbound operation. On K Street, two travel lanes in each direction would be provided during the peak hours, allowing excess roadway width to be allocated to parking, bicycle facilities or other uses.

The one-way pair system would significantly improve traffic operations in the heart of NoMA, resulting in a LOS “C” or better in all peak hours. The recommendation to create a one-way couplet is not intended to penalize access to any one property, but strives to balance the transportation needs and efficiency throughout the neighborhood. During peak hours of traffic, two travel lanes will be required. During non peak hours one travel lane will

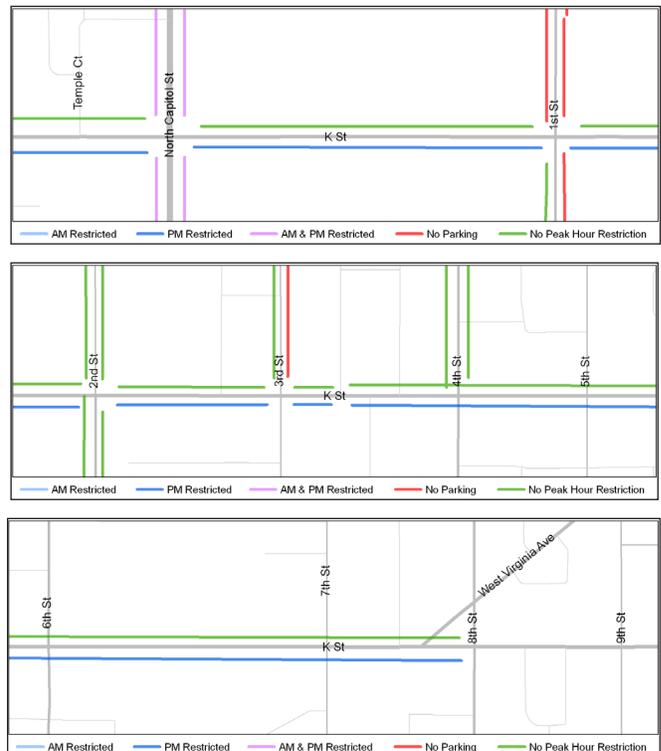
be sufficient providing a natural traffic calming effect throughout the roadway. This will shorten pedestrian crossing distances dramatically outside of rush hour-reducing delays at intersections while improving pedestrian safety. Within the mixed use area, it will be possible to provide cycle tracks on both sides of the roadway, facilitating two-way bicycle access along K Street, separated from vehicular traffic. Full time parking can be provided on the north or south side of the roadway along with curb extensions at intersections to further shorten pedestrian crossings.

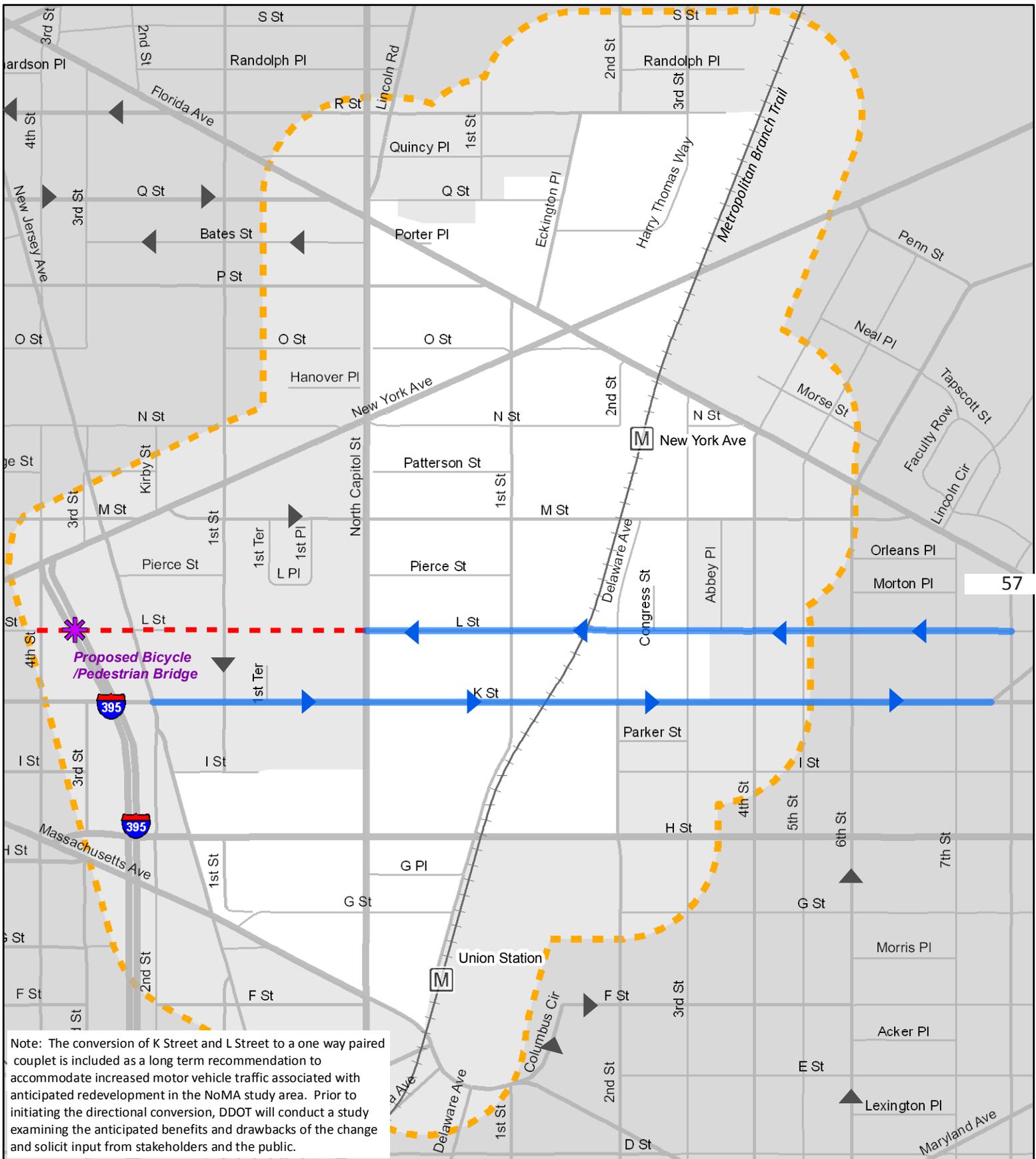


K STREET PROPOSED CROSS SECTION

The proposed one-way couplet would impact on-street parking, as shown below.

RECOMMENDED ON-STREET PARKING K STREET (ONE-WAY PAIR)





Note: The conversion of K Street and L Street to a one way paired couplet is included as a long term recommendation to accommodate increased motor vehicle traffic associated with anticipated redevelopment in the NoMa study area. Prior to initiating the directional conversion, DDOT will conduct a study examining the anticipated benefits and drawbacks of the change and solicit input from stakeholders and the public.

Long Term Concept K Street & L Street One-Way Pair Figure 15

Legend	
Metrorail Station	
Metrorail Red Line	
Study Area	
Existing Shared Use Path	
Two Way to One Way	New Road
Recommended One Way Travel Direction	Existing One Way Travel Direction

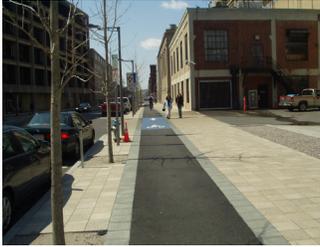
0 500 1,000 Feet

Tools: DesignGroup K... & Associates, P.C.

Base Data Source: DC GIS
No warranties of any sort, including accuracy, fitness or merchantability, accompany this product.

ONE-WAY PAIR, CONT.

A one-way couplet would improve traffic operations throughout NoMA, while also providing space for features such as a cycle track. Additional design considerations relating to the one-way couplet are shown below.



Add a cycle track.



Photo: James Mackey

Ensure safe crossing conditions.



Add a floating bike lane.



Provide a curb walk.

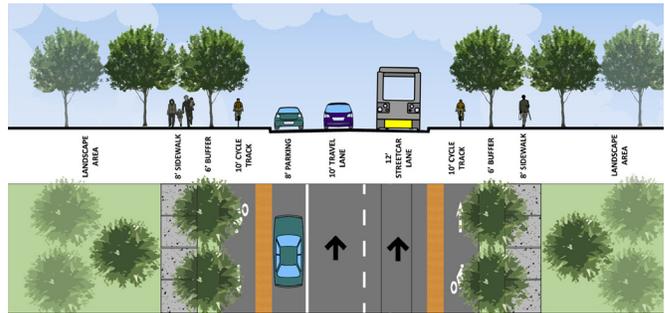
TRANSIT CONSIDERATIONS

DDOT is developing a street car network to complement existing transit options. Construction has begun on a new streetcar line in Anacostia and tracks are being laid on H Street and Benning Road. The H Street/Benning Road line is scheduled to be completed in 2010. A proposal to extend this line through NoMA is being considered. The extension would use the Hopscotch Bridge to K Street via New Jersey Avenue. Also under consideration is a street car line on K Street that would terminate on 1st Street, NE next to WMATA's Union Station pedestrian entrance.

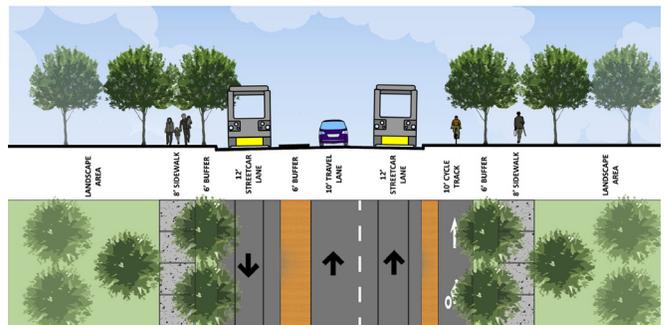
Each option developed for K and L Streets will not preclude future streetcar operation on either corridor. Assuming the streetcar operates in mixed traffic conditions, the primary evaluation criteria will be vehicular mobility as a surrogate for streetcar mobility. The one-way operation of K and L Streets would require either a similar one-way system for the streetcar or preservation of space for a contra-flow westbound streetcar line along portions of K Street converted to one-way vehicular operation. The recommendations

in this Plan do not preclude a streetcar alignment; rather a streetcar could complement these recommendations. However, follow-up studies will be needed as the plans for a streetcar become clearer. A detailed planning study of the street car system in DC is planned in the near future.

K STREET ONE-WAY STREETCAR

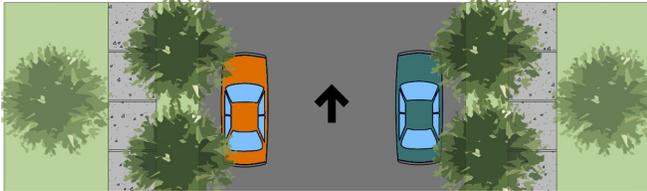
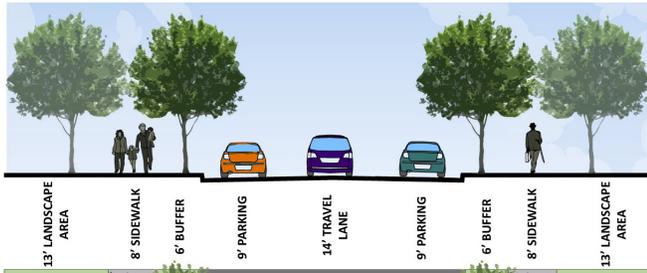


K STREET TWO-WAY STREETCAR

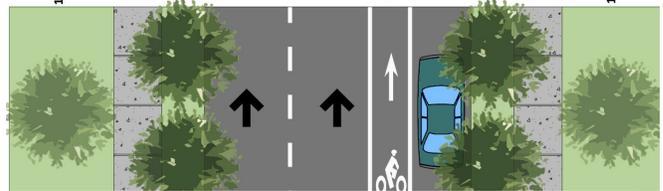
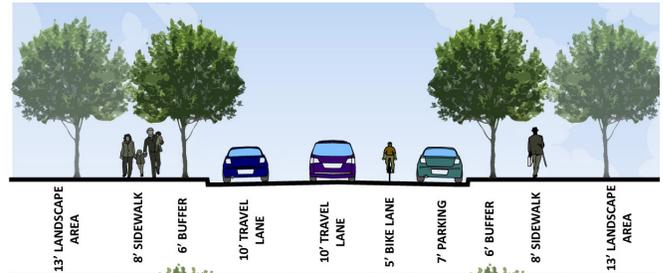


L STREET

Figure 16: L Street Recommendations



L STREET EXISTING CROSS SECTION



L STREET PROPOSED CROSS SECTION

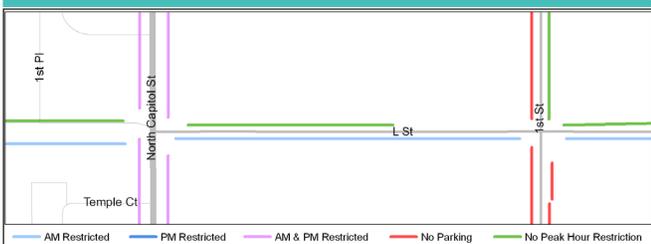
OVERVIEW

As noted, the east-west, one-way couplet system was developed as a long term alternative for K Street and L Street in an effort to provide on-street parking, turn lanes, and bicycle lanes, while improving vehicular mobility. Under this scenario, L Street would be converted to one-way westbound operation between West Virginia Avenue, NE to 1st Street, NW. Each street would provide two westbound travel lanes in each direction during the peak hours, allowing excess roadway width to be allocated to parking, bicycle facilities or other uses. The one-way system would significantly improve traffic operations in the heart of NoMA, resulting in a LOS "C" or better in all peak hours. A cycle track on either K or L Street and an extension of L Street over the I-395 interchange could be completed in tandem with this change.

STREETCAR CONSIDERATIONS

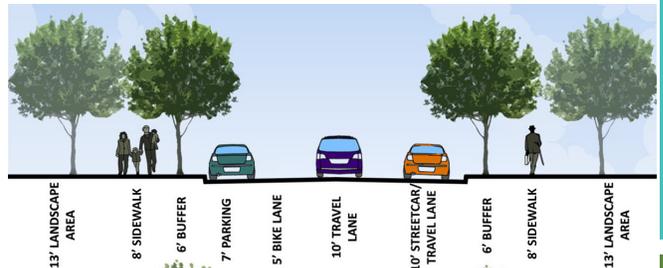
As the District develops a streetcar system, it is important to consider the potential of a streetcar on corridors such as L Street. Assuming the streetcar operates in mixed traffic conditions, the primary evaluation criteria will be vehicular mobility as a surrogate for streetcar mobility since the pace of traffic will dictate the pace of the streetcar. The one-way operation of L Streets would require either a similar one-way system for the streetcar or preservation of space for a contra-flow westbound streetcar line.

RECOMMENDED ON-STREET PARKING L STREET



L Street NW

L Street NE



L STREET ONE-WAY STREETCAR



TABLE 1: OPTIONS FOR K AND L STREET

Option	Pros	Cons
A – No build: modify existing by extending hours and locations of parking restrictions, adding turn restrictions	<ul style="list-style-type: none"> Minimal cost Modest improvement to vehicle circulation 	<ul style="list-style-type: none"> No bicycle improvement Minimal pedestrian improvement Degraded vehicle LOS Degraded transit performance
B – Road diet: reducing roadway to 2 through lanes, adding turn lanes and bike lanes, providing full time parking	<ul style="list-style-type: none"> Minimal cost Provides bike lanes Improves motorists comfort by providing turn lanes and phasing Maximizes multi-modal balance Provides full time parking 	<ul style="list-style-type: none"> Degraded vehicle LOS Potential difficulty entering K and L from garage access points due to congestion Potential increase to pedestrian conflicts with turning traffic Potential transit performance degradation
C – One-way pair system on K and L Streets between West Virginia Avenue, NE and 1st Street, NW with cycle track and full time parking	<ul style="list-style-type: none"> Provides separated bike facility Maintains parking full time on one side Improves pedestrian crossings Improves vehicular LOS Reduces conflicts Potential for LID treatments Improved transit performance 	<ul style="list-style-type: none"> High cost for elevated separated bike facility and roadway reconstruction Includes options for streetcar integration Reduces vehicle circulation Increases peak hour traffic on L Street, NE Requires parking restriction on L Street, NE

TABLE 2: ADVANTAGES AND DISADVANTAGES OF ONE WAY COUPLETS

Advantages	Disadvantages
Optimal Traffic Flow	Cost of signing/signal/pavement marking changes
Reduce pedestrian, vehicle and bicycle conflicts	New traffic signal needed at 2nd/K Street and 3rd/L Street
Simplified signal phasing	Impact to cross-section in residential neighborhoods will introduce new parking restrictions during peak hours
Less crossing distances for pedestrians	Potential for increased vehicular speeds
More on-street parking capacity	Potential impact to bus routes and bus stops
Does not increase overall system traffic volumes	Additional travel time and distance (e.g. driving around the block, to access parking garages)
Allows right-of-way for a potential linear park (see the linear park design guidelines from the NoMA Vision Plan and Development Strategy for additional information).	
Strengthens connections between NoMA and adjacent neighborhoods	
Extra capacity may improve other two-way conversions (e.g. M Street)	

FIRST STREET, NE

As development occurs along First Street, NE, a dedicated pedestrian realm and a separate dedicated bicycle realm must be created and/or maintained. This dedicated bicycle facility must be designed to accommodate the volumes of bicycle traffic anticipated given the proximity to the Metropolitan Branch Trail. Conceptual approaches to providing this bicycle facility are illustrated on the following pages. At minimum, a ten-foot facility separated from traffic by bollards should be provided. However, other alternatives that locate the bicycle facility closer to the front of the buildings and away from motor vehicles are preferred and should be pursued as the area redevelops.

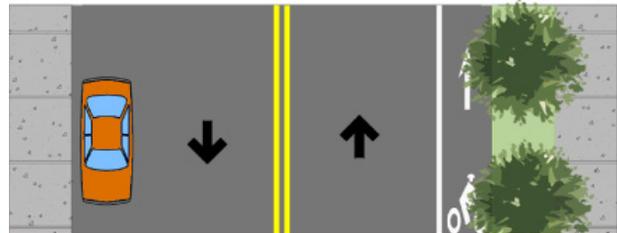
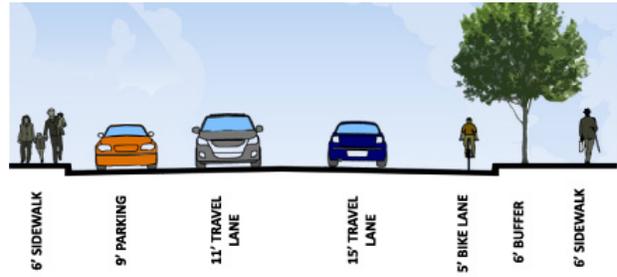
UNDERLYING GOALS

Provide curbside parking where possible to support a pedestrian and business friendly Main Street.

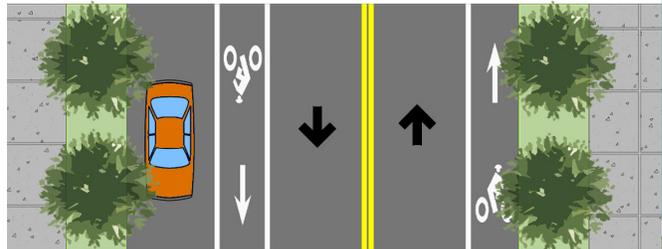
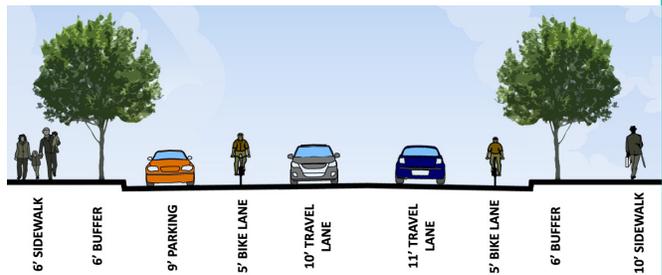
Maximize existing roadway space to provide capacity for future traffic growth.

Minimize curb changes to preserve pedestrian space.

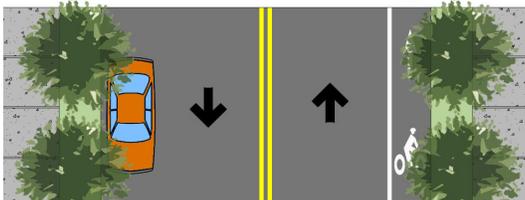
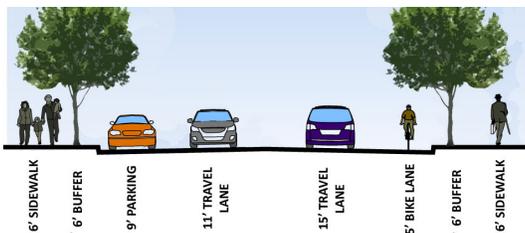
Enhance the Metropolitan Branch Trail connection between M Street ramp and G Street.



FIRST STREET B/W K ST & L ST: EXISTING



FIRST STREET B/W G ST & K ST: EXISTING



FIRST STREET B/W L ST & NEW YORK AVENUE: EXISTING

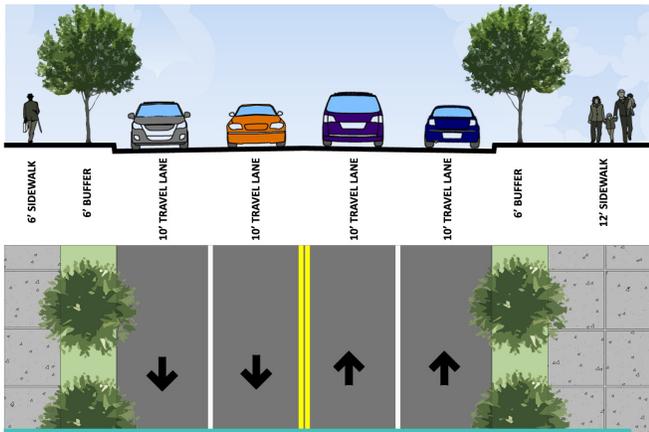
LONG-TERM FACILITY RECOMMENDATION

Key corridor: First Street, NE

Extent: First Street, NE from New York Avenue to L Street.
Improvement: 4 peak travel lanes, wide sidewalk (east side).

Facility: Shared use path.

Implementation: Eliminate bike lane and on-street parking (west side); widen existing 6 foot sidewalk on east side of First Street to function as a 12 foot shared use path; with redevelopment of adjacent property construct separate pedestrian walkway system buffered from path.

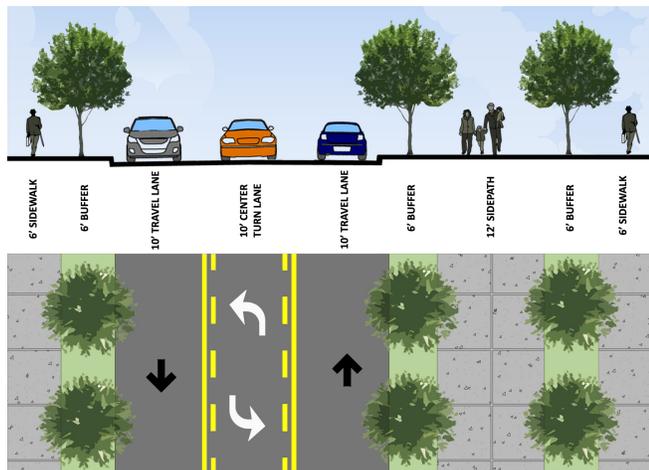


FIRST STREET B/W NEW YORK AVENUE & L STREET: PROPOSED

Extent: First Street from K Street to L Street.

Facility: 2 travel lanes with continuous left turn lanes, shared use path.

Implementation: Eliminate parking and bike lane, create center turn lane; add separated shared use trail



FIRST STREET B/W K ST & L ST: PROPOSED (LONG TERM)

on east side by narrowing roadway from 40 feet to 30 feet with east side reconstruction; with redevelopment of adjacent property construct separate pedestrian walkway system buffered from path.

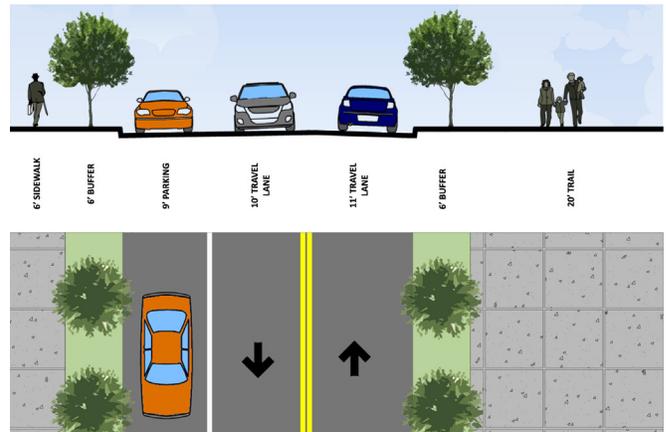
Extent: First Street from K Street to G Street.

Facility: Shared use path.

Long Term Option A

Facility: Two travel lanes with 20-foot wide trail (east side)

Implementation: Remove bike lanes, add separated shared use trail on east side with curb movement (narrow roadway from 40 feet to 28 feet with east side reconstruction).

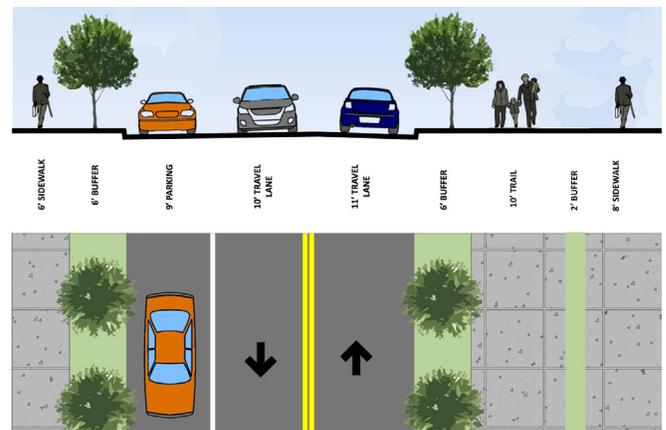


FIRST STREET B/W G ST & K ST: PROPOSED (LONG-TERM OPTION A)

Long Term Option B

Facility: Two travel lanes with shared use trail (east side)

Implementation: Remove bike lanes, add a separated shared use path trail (10-foot min.) on east side by narrowing roadway from 40 feet to 30 feet with east



FIRST STREET B/W G ST & K ST: PROPOSED (LONG-TERM OPTION B)

side reconstruction, construct separate pedestrian walkway system buffered from path.

Extent: First Street from G Street to Massachusetts Avenue.

Facility: Pedestrian priority street.

Implementation: Reconstruct roadway as a curbless pedestrian priority street; restrict traffic to emergency vehicles and delivery vehicles.

To maximize capacity given the projected traffic growth, it will be required to restrict parking at the following locations to provide LOS “E” or better operation (except at New York Ave):

- At all times between N Street and New York Avenue to provide 4 moving travel lanes – 2 northbound and 2 southbound.
- AM and PM peak periods on the west and east curbs from N to L Streets to provide 4 moving travel lanes – 2 northbound and 2 southbound.

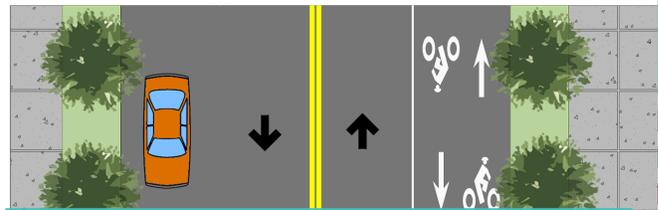
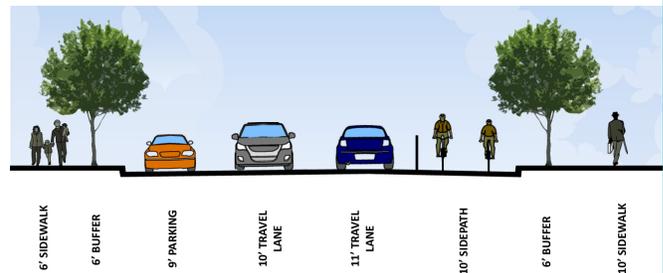
Parking should be restricted at all times on the eastbound and/ or westbound approaches to 1st Street from N Street, Patterson Street, M Street, Pierce Street and L Street to provide a separate left-turn lane and shared right and through lane.

Modify signal phasing to improve the efficiency of the existing signal operations, increase pedestrian safety and reduce vehicle delay at the following locations:

- 1st and L Street, NE (implement east and westbound left-turn phasing)
- 1st and K Street NE (implement east and westbound left-turn phasing)
- Massachusetts Avenue at 1st Street NE (exclusive pedestrian phases)

SHORT-TERM FACILITY RECOMMENDATION

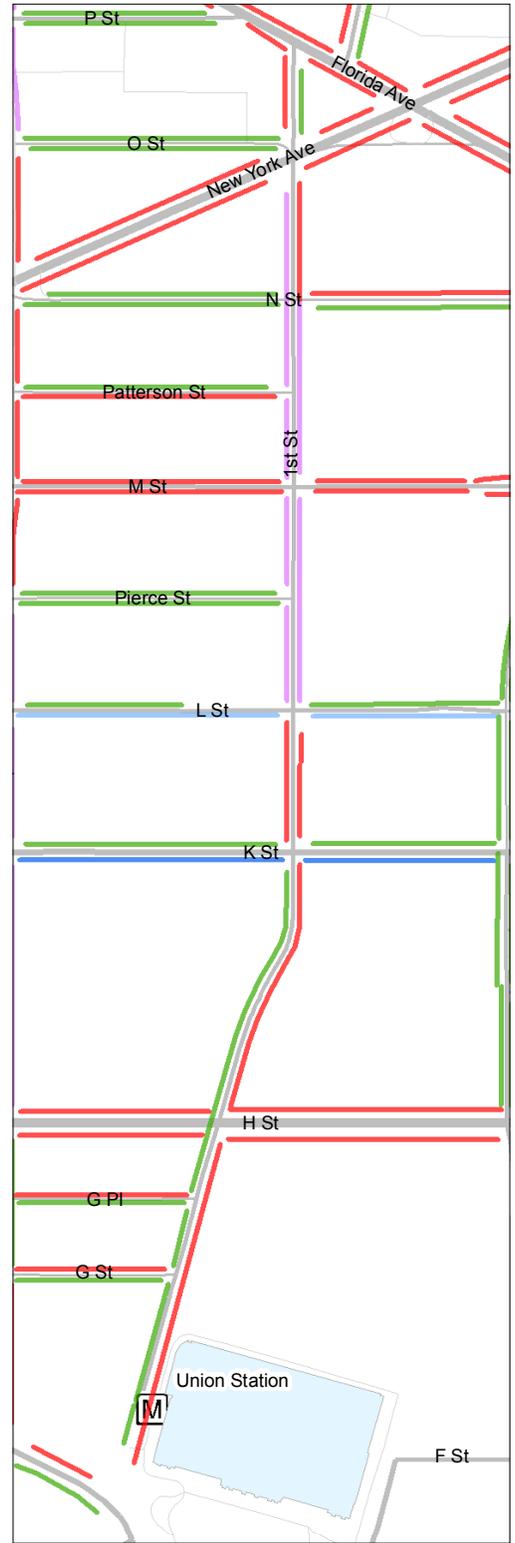
- Restripe and reconstruct roadway between New York Avenue and N Street to provide 4 travel lanes. Eliminate existing bike lane; restripe roadway to provide restricted parking lane southbound and two travel lanes northbound. Widen roadway towards the east to accommodate 6-foot planted median to create gateway and to provide access management.
- Restripe roadway between N Street and L Street to provide on-street parking on both sides with 2 travel lanes. Eliminate existing bike lane; restripe roadway to provide two 8-foot parking lanes and two 12-foot travel lanes.
- Create a separated shared use path between M Street and L Street. Eliminate existing bike lane; widen existing 6-foot sidewalk to create a 12-foot shared use path on the east side of First Street.
- Create a separated street level shared use path between L Street and K Street. Eliminate existing bike lane; restripe roadway and add bollards to create a 10-foot shared use path on the east side of First Street (this option only applies if 1st Street is not reconstructed in the short term at this location).



FIRST STREET B/W K ST & L ST:
PROPOSED (SHORT TERM)



- Planned Ramp
- Existing Ramp
- Existing Trail
- Proposed Trail



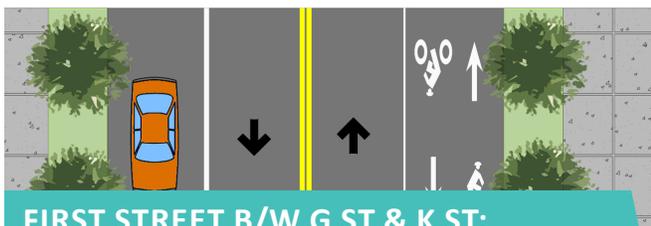
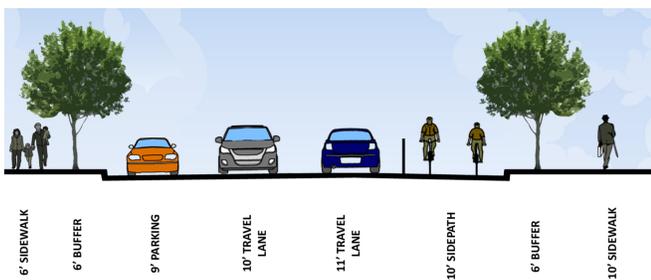
- AM Restricted
- PM Restricted
- AM & PM Restricted
- No Parking
- No Peak Hour Restriction



- Create a separated street level shared use path between K Street and G Street. Eliminate existing bike lanes; restripe roadway and add bollards to create a 10-foot shared use path on the east side of First Street.
- Install traffic signals at the following locations:
 1. 1st Street, NE and N Street, NE (including east, west and southbound left-turn phasing)
 2. 1st Street at Pierce Street, NE (including northbound left-turn phasing)
- Restrict parking within 75 feet approaching the intersections of First Street and K, L, M, and N Streets and shift through traffic to provide a short striped left turn lane.

ADDITIONAL RECOMMENDATIONS

- The connection to the Metropolitan Branch Trail will be made for the foreseeable future at the existing M Street ramp. Ultimately it will be desirable to replace the existing stair access at L Street with a ramp.
- To provide the connection to the Metropolitan Branch Trail, it is recommended a shared use path be constructed on the south side of the roadway in place of the existing parking.
- The NoMA plan is calling for the creation of a pedestrian priority curbsless street on First Street between G Street and Massachusetts Avenue.
- Signal timing plans for the intersections of K and L Street should attempt to minimize potential conflicts between turning vehicles and Metropolitan Branch Trail users.
- A proposed median on First Street between New York Avenue and N Street would not impact traffic operations; installation would be dependent upon funding.
- Additional signage and striping may be needed in order to accommodate approved and permitted “lay-by” space along First Street, NE, given the recommended on-street parking restrictions in this plan. In addition, the lay-by space may need to be restricted during rush hour to minimize impact on traffic operations.



**FIRST STREET B/W G ST & K ST:
PROPOSED (SHORT-TERM)**

- A *SmartBike* facility should be provided near the intersection of First Street, NE and M Street. Space for a *SmartBike* facility has been reserved and allocated at this location as part of the development process.

PROGRAM AND POLICY RECOMMENDATIONS

RECOMMENDATION 8

Implement Transportation Demand Management (TDM) strategies

NoMA needs strong TDM programs to manage future travel demand on the system. TDM programs currently in place are limited, and most development expected in NoMA is “by right”, meaning that zoning variances will not be required. As a result, successful TDM strategies may best be achieved through the establishment of a Transportation Management Association (TMA). The action items below describe the formation of a TMA and specific TDM programs likely to have the greatest impact on NoMA. More detailed information on the TDM strategies recommended for NoMA is provided in this following chapter.

- *Action 8A: Create a Transportation Management Association (TMA):* A TMA is a non-profit, member-controlled organization, often affiliated with a Business Improvement District, that provides transportation services in a given area. They are often created through a public-private partnership where area residents and businesses work with local government to provide an institutional framework for TDM programs. TMAs are typically more efficient than government-controlled programs because they are administered directly by the member organizations. By pooling resources within the service area, TMAs also allow smaller business to offer commute benefits or programs typically associated with larger companies.

Ideally, all businesses (or property owners) within the boundaries of the TMA should be required to pay membership dues based

on size or number of employees, and with additional monetary support from the District. One possibility for local funding is to have parking revenues generated in NoMA returned directly to the TMA to fund multi-modal transportation improvements.

Every member of the supporting businesses within the TMA would receive equal opportunity to the benefits and resources the TMA provides. Other possible structures include allowing businesses to choose whether or not to be involved, or relying on grants for funding (note that TMAs can continue to pursue grants even if dedicated funding is in place). Note that creating a TMA in NoMA would likely require legislative action.

- *Action 8B: Implement TDM strategies through the TMA:* Once in place, a TMA will work with DDOT to set mode share goals and manage travel, including informing residents, employees, and employers in the neighborhood about alternative travel options (e.g., transit, walking, and biking), opportunities to shift travel times outside of the peak period, and whether to travel at all (e.g., telecommute options). Once a TMA is formed, the members should further study and pursue TDM programs that will have the greatest benefits for the neighborhood, while considering the amount of funding available. Specific TDM strategies are discussed in detail in the following chapter.
- *Action 8C: Actively Manage On-Street Parking:* The total number of on-street parking spaces available in NoMA will remain relatively static in the future even as development increases, as very few new streets are being proposed within the study area. This suggests that demand for on-street parking will continue to increase in the future. Proactively managing this demand is critical to the efficient operation of the NoMA transportation system. The status of on-street parking once the recommended alternatives on the key corridors have been implemented is shown in Figure 18.

On-street parking management in NoMA should use the “performance-pricing”

concept currently being pioneered in the District in Columbia Heights. Under this concept, prices for parking are set to achieve a pre-determined target utilization (e.g., 85% of spaces used at any given time). The target utilization is intended to represent the most efficient use of the available parking resources, by:

- Prioritizing high-value, short duration trips (i.e., on-street parking for customers rather than employees);
 - Replacing complex, confusing, and difficult to enforce parking time restrictions (e.g., 1-hour maximum, 2-hour maximum, etc.), while achieving the same goal of increasing turnover; and,
 - Ensuring that travelers can find available on-street parking easily rather than being required to circle the block (this decreases both traveler frustration and congestion).
 - Moreover, the revenue raised through such a parking management program could be returned directly to a NoMA TMA for reinvestment in transit, pedestrian and bicycle enhancements. Performance parking in NoMA should be accompanied by a performance monitoring program to ensure that pricing schemes continue to meet their objectives. This should be done in conjunction with DDOT's parking staff.
- *Action 8D: Limit Increases in new Off-Street Parking:* There are no parking maximums currently in place for NoMA. The available supply of off-street parking clearly influences traveler decisions and will play a major role in whether NoMA can achieve the goals laid out by this Plan. There are currently more than 7,400 parking spaces in NoMA, a number expected to more than double with proposed development. The proposed off-street parking is well in excess of both DC Zoning requirements and ITE/ULI recommendations for transit-rich areas and is a clear threat to the ability of NoMA to develop a truly multi-modal and sustainable transportation system.

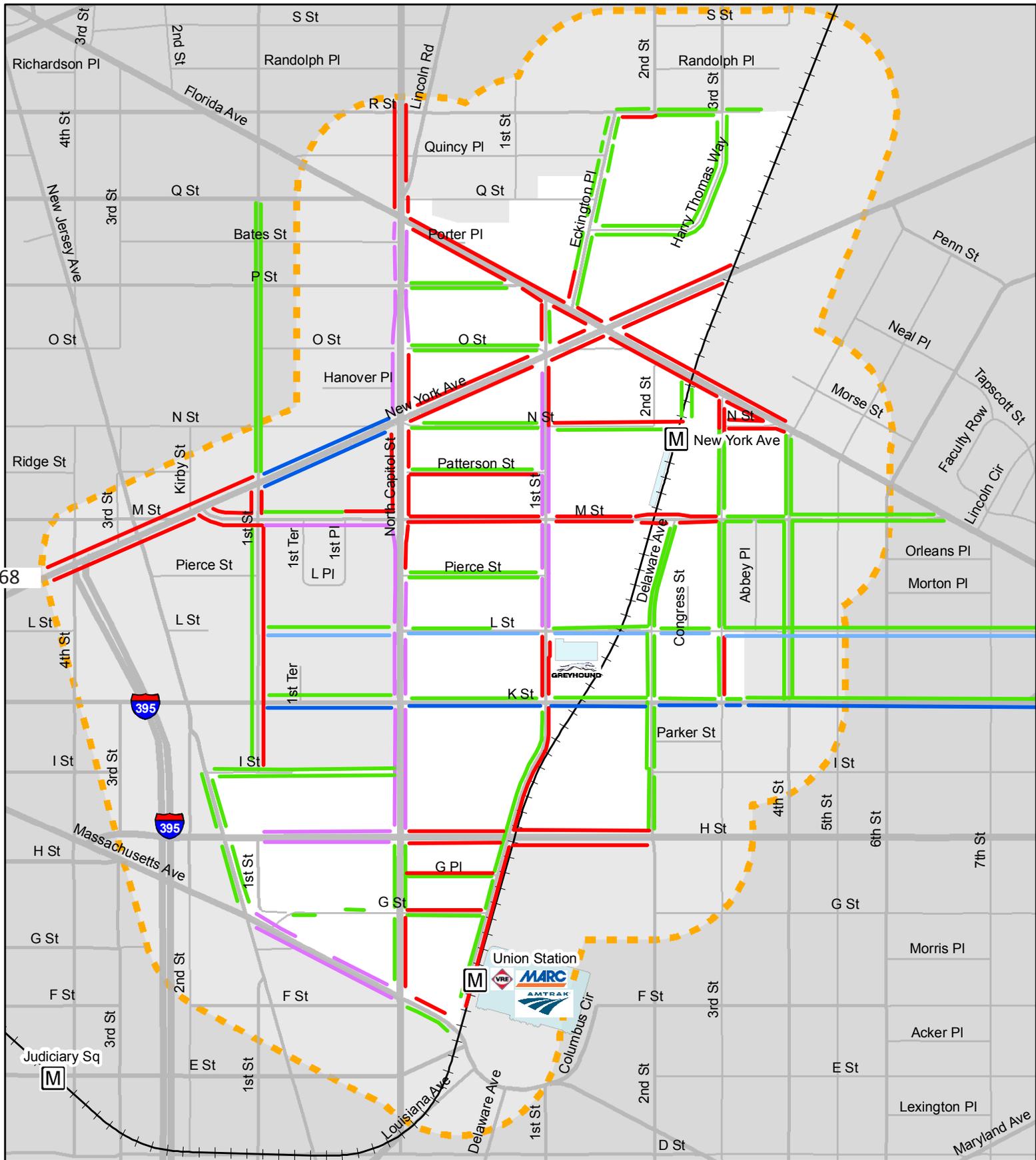
The simplest solution is to implement parking maximums for the study area that reflect the NoMA Vision. In the absence of legal parking maximum requirements, the implementation

of a NoMA TMA could also be an opportunity to pursue voluntary parking maximums, shared parking arrangements and performance pricing among TMA members. The existence of a TMA could provide developers and financiers with the necessary assurance that high-quality non-auto transportation options will be in place to limit the need for new parking. Further study should be done to determine the maximum levels of parking that are feasible and appropriate for NoMA; this study should be performed by DDOT in partnership with the future NoMA TMA.

- *Action 8E: Identify Shared Parking Opportunities:* Employers and developers should work together to provide complementary parking areas that result in more efficient use of parking resources. This will reduce the cost of building larger parking garages and the total amount of land used for parking. For example, adjacent or nearby buildings that include office space on the upper floors and retail or restaurant space on the ground level could benefit by providing parking that is used by office workers during the day and customers during the evening.

Shared parking uses parking resources more efficiently and results in an overall decrease in the cost and amount of parking that needs to be provided. Each opportunity requires analysis to determine the exact reduction possible based on the proposed mix of land uses. However, shared parking often results in a reduction of approximately 25% in the total number of off-street parking spaces needed.

- *Action 8F: Goals and Performance Measures:* Setting goals and monitoring performance are key components of a successful TMA. NoMA will need to set specific goals for what it intends for TDM to achieve (e.g. transit mode share, number of bike racks, etc.) and monitor progress toward those goals on a regular basis (preferably annual). Results of the monitoring will be used to refine TDM programs. The TMA and DDOT should work together in establishing goals and performance measures.



Future On Street Parking Figure 18

0 580 1,160 Feet

- Legend**
- Metrorail Station
 - Metrorail Red Line
 - Study Area
 - AM Restricted
 - PM Restricted
 - AM & PM Restricted
 - No Parking
 - No Peak Hour Restriction

The parking restrictions shown on this map reflect conditions after the implementation of the preferred alternative improvements on K Street, L Street, First Street, and M Street.



Tools: DesignGroup, K... & Associates, Inc., ATRAK

Data Source: DC GIS, Toole Design Group
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Relationship between Trip Generation and Parking

Trip generation is based on estimating the number of trips (single-direction, to and from the location) for a certain land use, building, or other location. Parking generation, on the other hand, is an estimate of the demand for parking at a location, and considers the amount of parking available. While both estimates are often determined separately, each demand has a direct relationship with the other. When parking is easily accessible and readily available, the number of single-occupancy vehicle trips for a given land use increases.

Evidence of the relationship between trip generation and parking availability in residential locations is documented in *Guaranteed Parking—Guaranteed Driving*¹. The 2008 study compared two urban residential neighborhoods in New York City with a similar number of households and employed residents, but two different proportions of guaranteed, off-street parking availability. The comparison found that the neighborhood with two times more off-street parking and six times more driveway parking has residents that are 28 percent more likely to drive in general, and 45 percent more likely to drive to the CBD for work. The study concludes: “When parking is scarce or hard to find at either or both ends of the trip the relative advantage of transit exceeds the advantages of automobile use.”

Similarly, a study completed by the Victoria Transport Planning Institute called *Land Use Impacts on Transport: How Land Use Factors Affect Travel Behavior*, found that stores located in neighborhoods with less parking generated fewer trips than stores with ample, free parking. It concludes:

“Neighborhood shopping districts and downtowns allow more park once trip (motorists park in one location and then walk to several stores, rather than driving from one store to another), which reduces total parking demand.”

1 Weinberger et. al. *Guaranteed Parking—Guaranteed Driving*. 2008. www.transalt.org/files/newsroom/reports/guaranteed_parking.pdf (accessed January 29, 2010)

FUTURE CONDITIONS

The recommendations in this chapter provide a framework to improve transportation conditions for all modes, while accommodating the growth in traffic and evolving multi-modal needs driven by increased development in the study area. As part of the process of identifying and evaluating the impact of these improvements, the following Level of Service (LOS) assessments were completed.

- Existing LOS provides a baseline for conditions in the study area and identifies problem locations. Figure 3 shows the results of this analysis.
- Future LOS without improvements provides a snapshot of conditions in NoMA as the neighborhood and region develop, assuming that no improvements are made. Figure 19 shows the results of this analysis.
- *Future LOS with improvements* shows how the proposed recommendations will improve conditions in the study area today and in the future. Figure 20 shows the results of this analysis.

A more detailed discussion of each of these steps is presented below.

EXISTING LOS

The LOS for motor vehicles at intersections and along corridors in the study area was evaluated using the Highway Capacity Manual (HCM) methodology to evaluate capacity during the AM and PM peak hours. The results indicate that while many of the intersections in the study area operate acceptably at LOS “D” or better, several signalized intersections in the study area currently experience LOS “E” or “F” conditions during peak hours, including Florida Avenue at P Street, Florida Avenue at Eckington Place, New York Avenue at I-395, New York Avenue at 1st Street, and Massachusetts Avenue at H Street.

FUTURE LOS WITHOUT IMPROVEMENTS

The Future LOS without Improvements assessment incorporates projected traffic volumes from individual development projects in the immediate area as well

as projected growth in existing regional and through traffic volumes. It assumes that no improvements to the roadway system are undertaken, with the exception of those projects already programmed by DDOT (i.e., the virtual circle at New York/Florida Avenue and the Columbus Circle improvements).

This initial analysis is based on unconstrained forecasts where all traffic demand is served (i.e., all vehicles wishing to enter the network are allowed to enter regardless of actual capacity). This analysis was performed to identify the magnitude of needed improvements. Note that the volume of traffic entering an intersection cannot exceed its capacity; demand that exceeds capacity is experienced by users as “peak-spreading” (i.e., an increase in the hours per day that the system experiences severe congestion).

Under this scenario, 21 of 41 intersections are projected to fail in at least one peak hour including:

- all intersections along 1st Street, NE from K to New York Avenue;
- all intersections along New York Avenue;
- all intersections along Florida Avenue west of New York Avenue; and,
- all intersections along North Capitol Street north of H Street.

In addition, six of the ten stop-controlled intersections in the study area are projected to fail. Due to the high volume of turning movements forecasted within the NoMA grid (bounded by K Street, New York Avenue, 2nd Street, NE and North Capitol Street), several intersections that do not have signal control and/ or exclusive turn lanes are projected to experience severely oversaturated conditions (e.g., volume-to-capacity ratios well in excess of 2.0). Average vehicle delays at critical intersections along the major arterials are predicted to approach 10 minutes. This delay is a result of compounding queues and demand significantly exceeding available roadway capacity.

Simulation results under this condition showed extensive queues along all major arterials including:

- New York Avenue from I-395 to West Virginia Avenue.
- North Capitol Street from H Street to Florida Avenue.
- K Street from New Jersey to 3rd Street, NE.
- Florida from North Capitol to 4th Street, NE.

FUTURE LOS WITH IMPROVEMENTS

The Future LOS with Improvements assessment also incorporates projected traffic volumes from individual development projects and growth in existing regional through-traffic volumes. However, this analysis assumes implementation of the improvements to the roadway system recommended in this Plan. Under these constrained forecasts, and with all recommended TSM improvements implemented, only five of 41 intersections remain at LOS “F”.¹ These intersections are on the major arterials such as New York Avenue and Massachusetts Avenue but trips in and out of NoMA will no longer need to use these streets. In addition, queues will not extend a full block between traffic signals and the delay at signals will be under 2 minutes. The length of the peak period may still be 2-3 hours.

Tables 3 and 4 summarize the capacity analysis with the recommended improvements. Table 3 shows the LOS with the one-way pair of K and L Streets discussed in this chapter and Table 4 shows the LOS without this improvement.

Table 3: One Way Pair Improvements

Intersection	Control	Delay	V/C	Level of Service
1st at K NE	Signal	21 (26)	0.77 (0.82)	C (C)
1st at L NE	Signal	27 (17)	0.80 (0.65)	C (B)
North Cap at K	Signal	21 (30)	0.84 (0.83)	C (C)
North Cap at L	Signal	16 (27)	0.80 (0.94)	B (C)

¹ As a result of demand exceeding capacity on major arterials, the expectation is that a percentage of the over-saturated traffic volume will in fact be constrained, or metered, and not able or willing at the cost in terms of time and money, to enter the roadway network, resulting in trips shifted to another time outside of peak hour, shifted to another route other than those in NoMA, shifted to another mode of travel other than vehicle, or not made at all. This assumption is well documented in travel demand modeling research, and is necessary to apply for this study in order to refine the traffic forecasts, develop reasonable roadway improvements, and begin to set goals for target mode shares and other traffic management benchmarks. The model was therefore revised with a 20% reduction in traffic demand before testing any planned roadway improvements.

Table 4: Improvements without the One Way Pair

Intersection	Control	Delay	V/C	Level of Service
1st at K NE	Signal	73 (32)	1.22 (0.81)	E (C)
1st at L NE	Signal	42 (49)	1.05 (0.99)	D (D)
1st at M NE	Signal	43 (46)	1.01 (0.95)	D (D)
1st at N NE	Signal	64.3 (25)	1.05 (0.87)	E (C)
1st at Pierce	Signal	27 (7)	0.91 (0.68)	C (A)
1st at Florida	Signal	51 (21)	1.01 (0.78)	D (C)
3rd at M NE	Signal	17 (25)	0.46 (0.73)	A (C)
Florida at P	Signal	43 (45)	1.06 (0.90)	D (D)
Mass at H/ 3rd	Signal	38 (84)	1.07 (1.19)	D (F)
New York at 1st NE	Signal	38 (130)	1.02 (1.32)	D (F)
New York at Florida	Signal	126 (367)	1.14 (1.48)	F (F)
New York at I-395/ 4th	Signal	65 (76)	1.11 (1.12)	E (E)
North Cap at Florida	Signal	32 (55)	1.02 (1.11)	C (D)
North Cap at K	Signal	33 (70)	0.96 (1.13)	C (E)-
North Cap at L	Signal	41 (27)	1.07 (0.89)	D (C)
North Cap at M	Signal	117 (93)	1.34 (1.24)	F (F)
North Cap at P	Signal	97 (21)	1.13 (0.97)	F (C)
North Cap at Pierce	Signal	16 (18)	0.83 (0.91)	B (B)
North Cap at New York	Signal	10 (33)	0.74 (1.03)	A (C)

MULTI-MODAL LOS

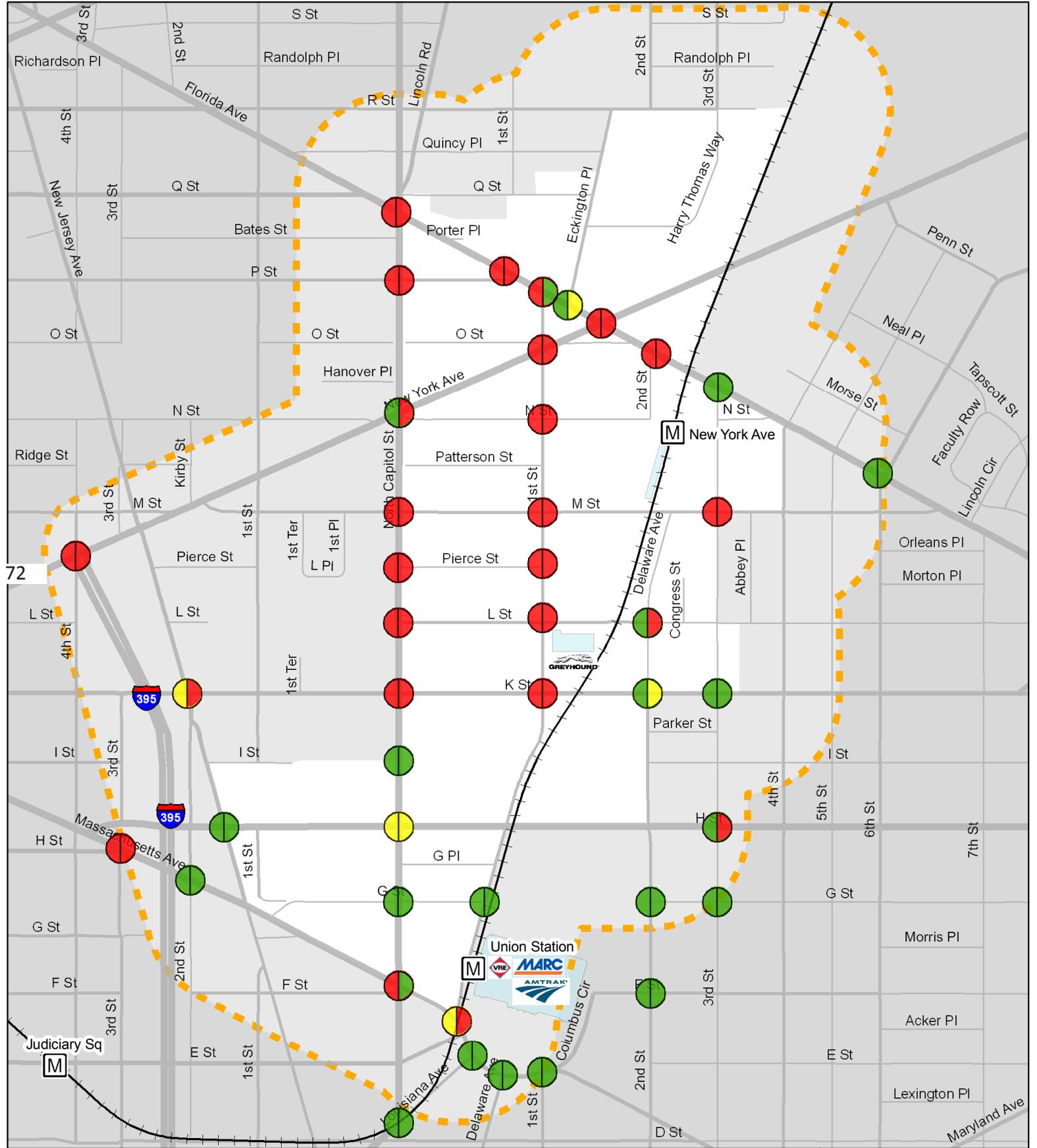
A Multi-modal Level-of-Service (MMLOS) evaluation along key corridors was conducted to determine the impacts, both positive and negative, of the proposed corridor recommendations on pedestrian and bicycle travel. Similar to motor vehicles, the results provide an assessment the “quality of service” (i.e., the roadway user’s perception of how well a given transportation facility operates) for each mode for six corridors within the NoMA study area:

- 1st Street – G Street to K Street
- 1st Street – K Street to M Street
- Florida Avenue – 3rd Street to 5th Street
- K Street – 1st Street, NW to 1st Street, NE
- L Street – 1st Street, NW to 1st Street, NE
- M Street – 1st Street, NW to 1st Street, NE

The analysis methodology used to produce the LOS scores are based on the procedures documented in NCHRP Report 616 and currently being incorporated into the upcoming edition of the Highway Capacity Manual. Scores are based on a variety of factors, including traffic volumes, traffic speeds, sidewalk

width, landscaping, presence of bike lanes, and more.

The NoMA evaluation compared MMLOS results between three scenarios: existing, future no-build, and future with corridor recommendations. In general, the future no-build conditions show a general degradation of pedestrian and bicycle LOS as traffic volumes in NoMA increase with development. However, improvements to bicycle and pedestrian facilities under the future build scenario help to counter the effect of increased traffic, resulting in LOS improvements under the build scenario for many corridors. As shown in Tables 5 and 6 on page 74, the overall results show that the addition of bicycle facilities (particularly separated facilities such as cycle tracks or sidepaths) significantly improve cycling conditions, with resulting LOS grades LOS of “C” or “B.” Similarly, roadways that include wider sidewalks or buffers separating pedestrians from vehicle traffic improve the LOS for pedestrians. For example, providing a wider sidewalk on the south side of Florida Avenue improves the pedestrian LOS from “D” to “C” along that side of the roadway.



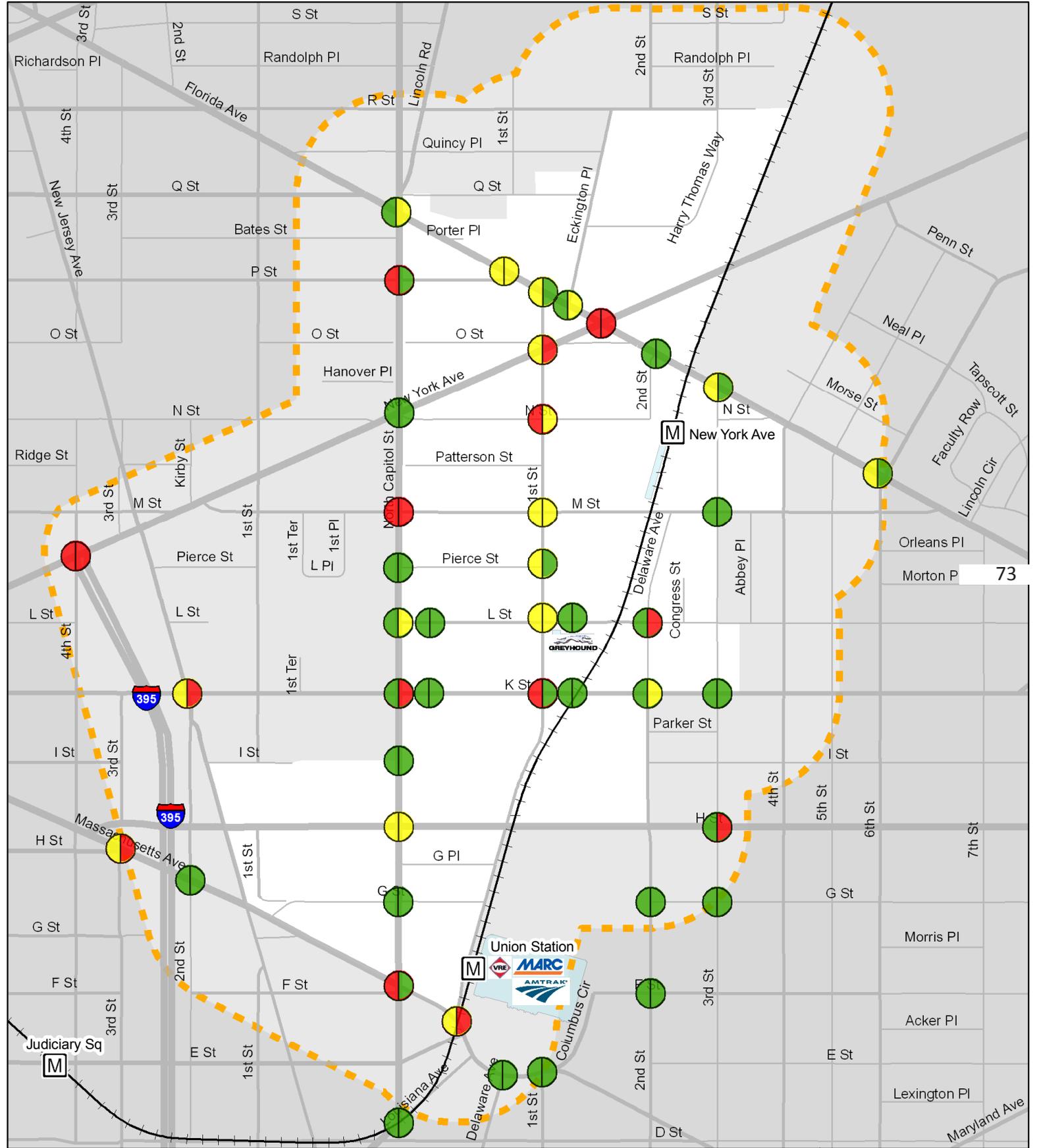
Future AM and PM Level of Service (Without Improvements) Figure 19

Legend

- Metrorail Station
- Metrorail Red Line
- Study Area
- Level of Service
- Level of Service A-C
- Level of Service D
- Level of Service E-F

0 500 1,000 Feet

Base Data Source: DC GIS
 No warranties of any sort, including accuracy, fitness or merchantability, accompany this product.



Future AM and PM Level of Service (With Improvements) Figure 20

0 500 1,000 Feet

Legend

- Metrorail Station
- Metrorail Red Line
- Study Area
- AM Level of Service / PM Level of Service
- Level of Service A-C
- Level of Service D
- Level of Service E-F

Toole Design Group K. TELSON & ASSOCIATES, INC. WVA

Base Data Source: DC GIS
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Table 5: Bicycle Level of Service

Segment	Direction	Existing	No Build	Build
1st Street - Mass. Ave. to K Street	NB	3.57 (D)	3.26 (C)	2.48 (B)
	SB	3.36 (C)	3.22 (C)	2.48 (B)
1st Street - K Street to M Street	NB	3.80 (D)	3.87 (D)	3.42 (C)
	SB	4.15 (D)	4.27 (E)	3.42 (C)
Florida Ave. - 2nd Street to 4th Street	EB	4.86 (E)	4.91 (E)	5.14 (F)
	WB	4.61 (D)	4.66 (E)	4.75 (E)
K Street - 1st Street NE to 1st Street NW	EB	4.19 (D)	4.36 (E)	2.70 (B)
	WB	3.93 (D)	4.19 (D)	2.81 (C)
L Street - 1st Street NE to 1st Street NW	EB	3.43 (C)	3.56 (D)	N/A
	WB	N/A	N/A	3.42 (C)
M Street - 1st Street NE to 1st Street NW	EB	4.08 (D)	4.15 (D)	3.78 (D)
	WB	N/A	N/A	3.78 (D)

Table 6: Pedestrian Level of Service

Segment	Direction	Existing	No Build	Build
1st Street - Mass. Ave. to K Street	NB	2.67 (B)	3.53 (D)	3.24 (C)
	SB	2.90 (C)	3.21 (C)	3.26 (C)
1st Street - K Street to M Street	NB	3.16 (C)	3.90 (D)	3.87 (D)
	SB	3.14 (C)	3.86 (D)	3.92 (D)
Florida Ave. - 2nd Street to 4th Street	EB	3.71 (D)	3.79 (D)	3.49 (C)
	WB	3.72 (D)	3.80 (D)	4.08 (D)
K Street - 1st Street NE to 1st Street NW	EB	4.00 (D)	4.01 (D)	3.57 (D)
	WB	3.62 (D)	4.73 (E)	3.60 (D)
L Street - 1st Street NE to 1st Street NW	EB	2.17 (B)	3.55 (D)	3.99 (D)
	WB	2.32 (B)	3.67 (D)	3.73 (D)
M Street - 1st Street NE to 1st Street NW	EB	2.51 (B)	3.07 (C)	3.94 (D)
	WB	2.68 (B)	3.30 (C)	3.58 (D)

CONCLUSION

This chapter provided recommendations for improving access, mobility, and circulation in NoMA. The following chapter provides additional detail on recommended TDM programs. An implementation strategy for the recommendations in this chapter is provided in Chapter 5.

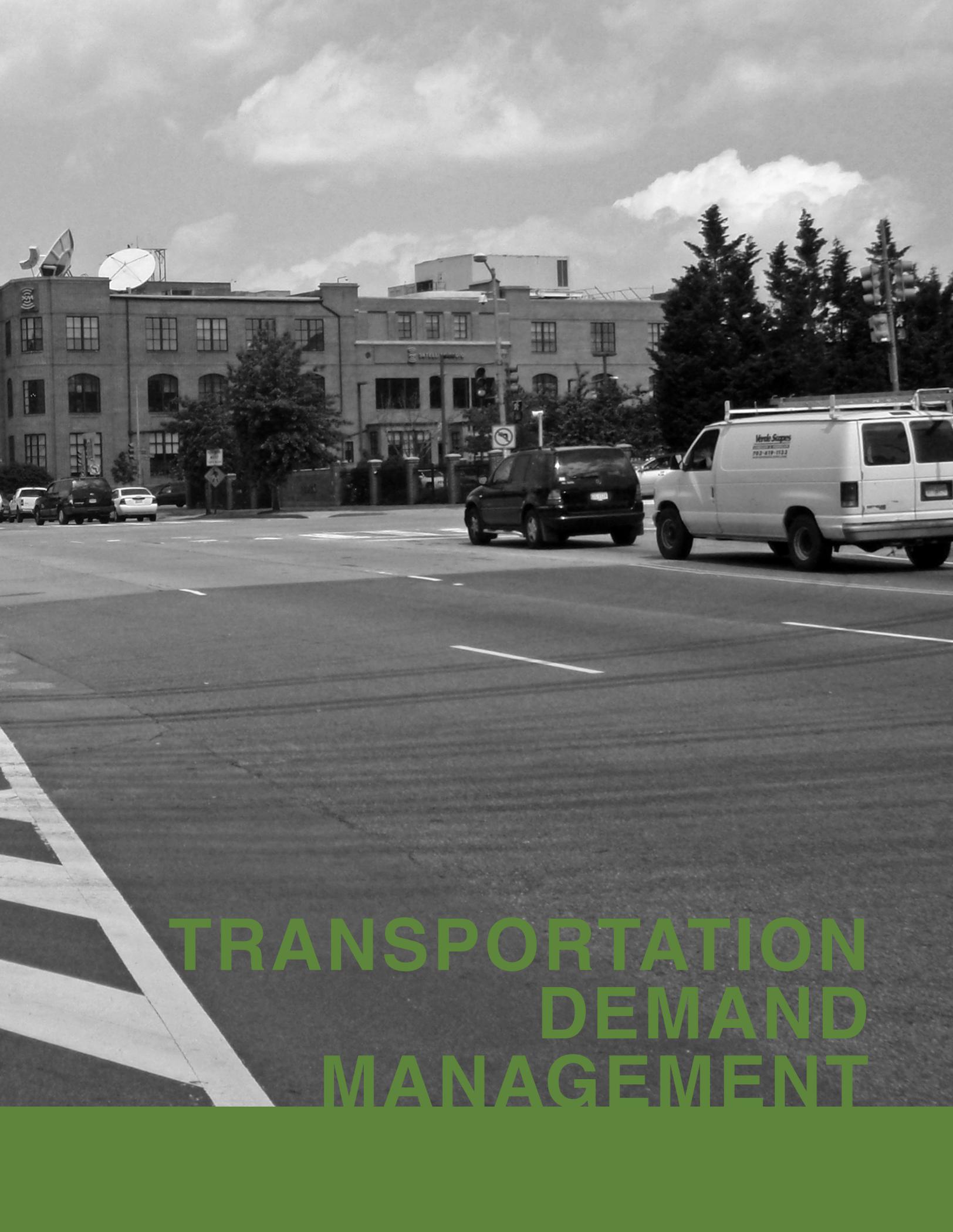


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TRANSPORTATION DEMAND MANAGEMENT

TRANSPORTATION DEMAND MANAGEMENT

The private automobile will continue to play a substantial role in NoMA's transportation system for the foreseeable future. At the same time, there is significant potential to leverage NoMA's central location and multi-modal transportation system to reduce overall demand for automobile travel. This chapter discusses strategies and methods for encouraging efficient transportation decisions, a strategy referred to generally as Transportation Demand Management (TDM).

OVERVIEW

The Victoria Transportation Institute provides the following general definition of transportation demand management:

"Transportation Demand Management (TDM) (also known as Mobility Management) is a general term for various strategies that increase transportation system efficiency. TDM treats mobility as a means to an end, rather than an end in itself. It emphasizes the movement of people and goods, rather than motor vehicles, and so gives priority to more efficient modes (such as walking, cycling, ridesharing, public transit and telework), particularly under congested conditions. It prioritizes travel based on the value and costs of each trip, giving higher value trips and lower cost modes priority over lower value, higher cost travel, when doing so increases overall system efficiency."

TDM can be thought of in two parts: infrastructure and programs. The TDM goal for infrastructure is to optimize the efficiency of the transportation network, while serving priority demands. Other sections of this report discuss proposed infrastructure improvements in NoMA. This section covers the programmatic aspects of TDM.

Transportation demand derives from individual decisions driven by numerous factors (e.g., trip purpose, available modes, distance, costs, etc.). By shifting these factors to favor non-auto travel for some travelers, programmatic TDM strategies have the potential to have a large positive impact on NoMA.

This section of the report identifies the need for TDM in NoMA, describes the potential of a Transportation Management Association to deliver TDM services in NoMA, and identifies those TDM programs with the greatest potential to positively impact NoMA.

MANAGING DEMAND

As described in detail elsewhere in this report, NoMA is in the midst of change, with millions of square feet of new development expected in the coming years. The capacity of the transportation system is relatively fixed; modest capacity increases are possible but there is limited potential (or desire) to dramatically increase capacity through road widening. As a result, growth must occur in concert with improved non-auto travel options to avoid straining the transportation system beyond its breaking point. In addition to the multi-modal infrastructure improvement recommendations developed as part of this project, NoMA needs strong TDM programs to manage future travel demand on the system.

TRANSPORTATION MANAGEMENT ASSOCIATIONS

While the need for TDM within NoMA is clear, mechanisms to ensure that appropriate TDM programs are in place are limited. Most development expected for NoMA is "by right", meaning that zoning variances will not be required. As a result, DDOT has no authority to require development to incorporate TDM strategies. Current voluntary demand management programs, such as www.goDCgo.com help but must be augmented by more targeted programs. The proposed changes to the District's parking requirements are unlikely to include parking maximums for NoMA, further limiting the likelihood that voluntary TDM programs can fully meet NoMA's needs.

Because DDOT currently lacks the authority to require TDM in NoMA, success may best be achieved through the establishment of a Transportation Management Association (TMA). A TMA is a non-profit, member-controlled organization, often affiliated with a Business Improvement District, that provides transportation services in a given area. TMA's are generally created through a public-private partnership where area residents and businesses work with local government to provide an institutional framework for TDM programs. TMAs are typically more efficient than

government-controlled programs because they are administered directly by the member organizations. By pooling resources within the service area, TMAs also allow smaller business to offer commute benefits or programs typically associated with larger companies.

The strongest TMAs have the following characteristics¹:

- TMAs should support a variety of transportation services, travel options and incentives, including planning efforts to create more pedestrian- and transit-friendly land use, and parking brokerage services to help businesses share and trade their parking resources.
- TMAs should include both positive and negative incentives. TDM programs tend to be most effective when they improve consumers' travel choices and provide incentives to use alternatives to driving when possible.
- TMAs should work to develop and maintain cooperation between transportation agencies, transit service providers, businesses, employees and residents who are affected by their programs.
- Produce an annual "State of the Commute" report, which describes TDM programs and resources, travel trends, and comparisons with other communities.

Key components to successfully implement a TMA within NoMA are discussed below.

Funding

TMAs are typically public-private partnerships that receive at least some level of local government support. In the case of NoMA, a likely source of District government funding could be parking revenue. Through District Council action, locally-generated parking revenue from meters could be returned directly to a NoMA TMA to cover operating costs. The Lloyd District TMA in Portland, Oregon, offers an example of this type of arrangement. Parking revenue is split 50-50 between the TMA and the City, and accounts for approximately half of the TMA's annual budget.

Member organizations (usually local businesses) also provide monetary support, usually in the form of paid dues. In addition, many TMAs rely on federal grant programs, such as the Congestion Mitigation and Air Quality (CMAQ) funds, for a significant portion of their funding.

Most existing TMAs use some combination of the above funding sources, but in general they fall into three types:

- 1) All businesses within the boundaries of the TMA are required to pay membership dues based on size or number of employees, and a public agency will also provide some level of monetary support. Every member of the supporting businesses within the TMA receive equal opportunity to the benefits and resources the TMA provides.
Example: Lloyd District Transportation Management Association
- 2) Business within the TMA have the option to join as a contributing member, and a public agency will also provide some level of monetary support. Employees of the businesses contributing to the TMA will have access to the benefits and programs that are provided. Other businesses may or may not be able to pay separately for certain services (such as carpool matching or employee surveys) that the TMA provides.
Example: Annapolis Regional Transportation Management Association
- 3) Businesses do not make payments or dues, and subsequently the organization is heavily dependent on local and Federal funds. The organization generates revenue (in addition to government sources) through coordinating transit pass sales for businesses, providing targeted TDM services for individual businesses, and in-kind donations. Usually other sources of revenue are being explored by the organization.
Example: Minneapolis Transportation Management Organization

Note that since the Minneapolis TMO does not require businesses in the downtown to pay dues, the organization relies heavily on Federal funding, which requires a percentage of local match funds. The Minneapolis TMO receives approximately 80 percent of funding from Federal funding and the rest is raised by providing services for businesses (roughly 15 percent) and in-kind donations (roughly 5 percent).

1 TDM Encyclopedia. Victoria Transport Policy Institute. 2008. Accessed 12/09/09 at <http://www.vtppi.org/tdm/tdm44.htm>

There are examples of each type of TMAs identified above, and others that use slightly different combinations for funding. In general, the TMAs that receive money from local businesses have the greatest impact because there is a reliable, steady source of funds to provide transportation options to employees and residents within the boundaries of the TMA. In particular, those programs that require all businesses within the TMA to make financial contributions are most effective.

Accountability

The most effective TDM programs result from active management, monitoring, and adjustment. These activities tie to the individuals/organizations held accountable for performance. The TMA provides for this accountability through the requirement by the TMA to annually monitor and report the performance of the TDM programs to the members and the City. These partners then review the performance and make recommendations to adjust the program to better meet the established goals and objectives. Often, success is achieved that causes new or heightened goals to be established and new or modified TDM programs to be implemented. Funding of these programs continues from City efforts, the efforts of the TMA Board, and the partnering agencies that benefit from the successes of the overall program.

Programs

Once a TMA is established, there are a number of TDM strategies and programs that can be implemented, from providing information on commuting options to building bike parking and providing free transit passes.

DDOT currently facilitates travel demand management in a number of ways by providing locations for car sharing vehicles and by providing transit service in the form of the DC Circulator. DDOT is also planning to implement changes to zoning requirements that will require developers to include TDM strategies with development, including provisions for parking maximums to reduce the availability of excess parking to encourage travelers to seek alternative modes.

However, many TDM strategies are only feasible in locations that have good transit access, pedestrian facilities and amenities, bike lanes and paths, and often include car-pooling or car-sharing alternatives. NoMA currently includes all of these components, making it a primary location for implementing TDM strategies.

The existing NoMA BID may ease formation of a TMA for NoMA since there is already a demonstrated willingness for businesses to work together to provide benefits realized by everyone in the neighborhood. While a NoMA TMA would likely be involved in many TDM programs, there are several opportunities that appear to have the greatest promise:

- Universal Free Transit Passes – the quantity of transit service to NoMA is exceptional, indicating that increasing employee use of transit will be a key component of TDM. A TMA can provide reduced or free transit passes to employees located in the TMA. A “universal” pass, where all employees receive a free transit pass regardless of whether they ask for it is most effective. Because not all employees will use the pass, a TMA may be able to negotiate a reduced rate with the transit agency. For instance, the Lloyd District TMA pays \$255 annually for transit passes valued at \$946.
- NoMA Circulator – funding to operate a NoMA Circulator transit route could come in part from a TMA.
- Parking—employers and developers in the neighborhood could work together to provide complementary parking areas that result in more efficient use of parking resources. This will reduce the cost of building larger parking garages and the total amount of land used for parking. For example, adjacent or nearby buildings that include office space on the upper floors and retail or restaurant space on the ground level could benefit by providing parking that is used by office workers during the day and customers during the evening. This uses parking resources more efficiently and results in an overall decrease in the cost and amount of parking that needs to be provided.
- Funding and managing secure bike parking.
- Providing information to employees on transportation options.
- Coordinating with car-sharing companies to promote car-sharing use.

Annual performance monitoring of commute trends within the NoMA.

RECOMMENDED STRATEGIES

NoMA's TMA could implement the following strategies:

- Universal Free Transit Passes – the quantity of transit service to NoMA is exceptional, indicating that increasing employee use of transit will be a key component of TDM. A TMA can provide reduced or free transit passes to employees located in the TMA. A “universal” pass, where all employees receive a free transit pass regardless of whether they ask for it is most effective. Because not all employees will use the pass, a TMA may be able to negotiate a reduced rate with the transit agency. For instance, the Lloyd District TMA in Portland, Oregon pays \$255 annually for employee transit passes valued at \$946. Alternatively, the TMA could subsidize their member’s participation in WMATA’s Smart Benefits program.
- Funding and managing secure bike parking
- Providing information to employees on transportation options.
- Coordinating with car-sharing companies to promote car-sharing uses.
- Annual performance monitoring of commute trends within the NoMA.

TMA/TDM EFFECTIVENESS

Setting goals and monitoring performance are key components of a successful TMA. NoMA will need to set specific goals for TDM (e.g. transit mode share, number of bike racks, etc.) and monitor progress toward those goals on a regular basis. Results of the monitoring can be used to refine TDM programs.

Arlington County, Virginia has developed a comprehensive method of reviewing goals and monitoring performance. In 2008, the county published its first “Making an Impact” annual report documenting the progress of Arlington’s transportation and environmental goals. Arlington County Commuter Services provides several resources on its webpage: <http://www.commuterpage.com/ACCS>.

Other documentation has shown that TMAs significantly reduce drive-alone trips by an average of 6-7% according to the Washington State TDM Resource Center. However, TMAs with aggressive

TDM programs have experienced greater benefits. As shown below, the Lloyd District TMA in Portland (which shares many similarities with NoMA) has resulted in a 31% reduction in drive alone commuting in 10 years.

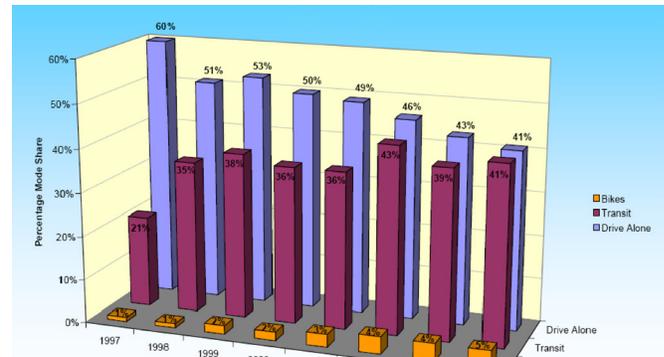


Figure 21: Lloyd District TMA Results

Arlington County, Virginia

As noted, Arlington County is a premier example of successful TDM strategies in the country. Efforts to reduce demand on roadways have allowed the area to continue to grow and develop, the magnitude of which would otherwise not have been possible. By utilizing transit-oriented development – (TDM) high-density, mixed-use development around transit stations – the County was able to grow its population and employment while maintaining existing traffic volumes. High levels of transit ridership, frequent local bus service, excellent walking and bicycling conditions, and a mix of land uses all work together to minimize the need to drive and thereby reduce the demand for parking or highway expansion. The TDM strategies employed by Arlington County have allowed development to prosper while maintaining relatively high levels of mobility. In fact, 50% of the County’s tax base is located on just 7% of its land, within the Metrorail corridors. Since 1980, total office space has doubled to more than 50 million square feet, 70% of which is located within the Metrorail corridors.

In 1990, Arlington adopted a Transportation Demand Management Policy that requires developers to provide TDM services and incentives as part of the project’s site plan approval. The policy also includes a description of TDM employer services and provides the framework for many demand management services that are now available. In emphasizing these goals, the County has been able to mitigate travel

demand for new developments without having to widen roadways and adversely impact established neighborhoods and businesses.

A mix of land uses and pedestrian-friendly designs have further reduced vehicular travel demand. A prominent network of pedestrian ways helps to connect travelers to the transit stations in the County, where little to no parking is provided. For example, at the Ballston Metrorail Station, 64% of transit patrons arrive by foot.

Compared to surrounding communities, Arlington County's Metrorail corridors' population increased two to three times faster than the regional population. Almost 40% of residents in Metrorail corridors commute using transit, while 10.5% walk or bike to work. Altogether, 60% of commuters living within the corridors do not commute alone, compared with 40% of residents outside these corridors. These successes have allowed the region to grow while maintaining traffic levels in the County.

Arlington County continues to grow by expanding and improving management of travel demand and parking. Currently, the capacity for 14 million square feet of commercial space and 22,285 housing units exist within the Metrorail corridors. Due to its commitment to TOD, it is estimated that Arlington County can sustain growth for 30 years to come.

CONCLUSION

Examples such as the Lloyd District in Portland, OR and Arlington County's programs demonstrate that a focused and aggressive TDM strategy can have real and significant impacts on mode choices. Investments in TDM should be a cornerstone of NoMA's efforts to prepare for projected land use and transportation changes, which are already underway today.







IMPLEMENTATION

IMPLEMENTATION

This chapter describes the action items required to achieve the access and mobility improvements recommended in Chapter 3. It identifies three categories of recommendations by time-frame: (1) short-term (before 2015); (2) medium-term (before 2020); and, (3) long-term (before 2030). Areas recommended for further study, planning-level cost estimates, and sample performance measures are also discussed.

While all of the projects recommended in Chapter 3 are needed to achieve the goals outlined in this Plan, it is not practical (or even desirable) that all projects should be implemented immediately. Some projects are ready for implementation right away, and should be pursued as soon as possible to build on the cooperation and momentum generated by this study. Other projects require significant capital expenditures and/or should be pursued in the future as conditions and funding warrant.

IMPLEMENTATION CHALLENGES

Implementation of the recommendations in this Plan will need to address key challenges. Projects and plans will need to be coordinated, especially because DDOT will have a limited ability to influence much of the development that will occur. An additional challenge is that projects with a significant impact on NoMA's transportation network, most importantly a potential streetcar, have not been finalized. These challenges are discussed briefly below.

- *Coordination.* A key factor in the implementation of the recommendations in this Plan will be the extent of coordination between ongoing and planned public and private sector projects. Implementation of the recommendations in this Plan should be coordinated with:
 - Ongoing and upcoming transportation projects such as the K Street bike lanes planned in 2010.
 - Previous plans and studies such as the Oyster Elementary School Safe Routes to School Plan.
 - Ongoing planning efforts such as the

- Mount Vernon Square circulation study.
- Streetcar planning and design efforts.
- Private development.

- *Limited regulatory authority.* Most of the proposed development in NoMA will be constructed "by right," which means that zoning variances will not be required. As a result, DDOT has no authority to require development to implement the recommendations in this Plan. This does not mean that individual property owners do not have an important role in implementing the recommendations in this Plan, only that their contributions will need to be encouraged through incentives and through participation in things like the TMA.
- *Streetcar planning.* DDOT is developing a street car network to complement existing transit options and to connect neighborhoods in DC. It has started construction of a new streetcar line in Anacostia and tracks are being laid on H Street and Benning Road. The H Street/Benning Road line, to the east of NoMA, is scheduled to be completed in 2010. Extending this line through NoMA is being considered through a connection over the Hopscotch Bridge and to K Street via New Jersey Avenue. Also under consideration is a street car line on K Street (west of the study area) that would terminate on 1st Street, NE next to WMATA's Union Station pedestrian entrance.

The recommendations in this Plan do not preclude a streetcar alignment. In fact, a streetcar may complement recommendations in this Plan. However, follow-up studies will be needed as the plans for a streetcar become clearer to assess the impact and implications of various streetcar alignments on the recommendations in this plan.

SHORT-TERM RECOMMENDATIONS (BEFORE 2015)

Short-term action items comprise a set of actions for which barriers to implementation are relatively minor. These items included policy recommendations; improvements that utilize existing infrastructure; and high-priority, low-capital improvements. In

many cases, short-term recommendations provide needed support to longer-term recommendations. For instance, forming a Transportation Management Association (TMA) and tracking performance measures now will allow for implementation of effective parking management strategies in the future.

Short-term recommendations are listed below. Chapter 3 provides detailed information for each recommendation:

- Filling a gap in the sidewalk network on 3rd Street in between N Street and Florida Avenue.
- Implementing a lane reduction on Florida Avenue to provide space for a wider sidewalk under the CSX tracks.
- Providing Leading Pedestrian Intervals (LPI) at ten intersections.
- Modifying the signal phasing at seven locations to improve the Level of Service (LOS) for all modes.
- Restricting left turns (on selected approaches) at the intersection of North Capitol Street and H Street.
- Prohibiting right turns on red at six intersections.
- Providing five pedestrian crossing islands.
- Providing a new SmartBike location at the New York Avenue Metrorail Station.
- Improving bike parking facilities at the New York Avenue Metrorail Station and throughout the study area.
- Relocating the bus stop on Massachusetts Avenue near Union Station.
- Improving access to the Metropolitan Branch Trail by extending on-road bicycle routes on R Street and Q Street.
- Forming a Transportation Management Association (TMA) to develop and implement a Transportation Demand Management (TDM) program. To implement this recommendation, a series of steps are recommended. These steps are highlighted below.
- Implement proposed improvements along First Street as noted in Chapter 3.

TMA/TDM Implementation Recommendations

An effective TMA will have community support, a dedicated funding source, and active involvement from those participating TMA activities. This study developed several of the first steps necessary to

Immediate Action Project List

A subset of the short-term recommendations were identified as immediate action projects. These immediate action projects, listed below, should be implemented within 24 months.

- Develop Smart Bike location at the New York Ave-Florida Ave-Gallaudet U Metrorail Station.
- Make Pierce, Patterson, L, and M Streets two-way between First Street and North Capitol Street. (Note this will require new or upgraded signals at 1st Street/M Street, North Capitol Street/ Pierce, North Capitol Street/ L Street, 1st Street/L Street and North Capitol Street/ M Street).
- Add a bollard separated in-road sidepath on First Street, NE from G Street to L Street when 1st St NE is reconstructed (FY13).
- Implement a “road diet” on K Street from New Jersey Avenue to First Street, NE (to continue the ongoing DDOT project to connect to the MBT. (Note that the K Street road diet may still require right-turn lanes/ parking restrictions at 1st Street and North Capitol Street).
- Create signalized left turn lane on SB North Capitol during non-AM peak. AM Peak retains left turn prohibition.
- Add a signal at the intersection of Pierce Street and North Capitol Street.
- Add a signal head on WB M Street at North Capitol Street.
- Add a signal at N Street and 1st Street.
- Implement the proposed Florida Avenue road diet and sidewalk widening.
- Add a mini traffic circle N St and 2nd Street near the ATF.

Note: Projects are contingent on funding.

establish a TMA, including identification of the geographical extents of the TMA (roughly similar to the study boundary) and coordination between DDOT, WMATA, the NoMA BID, and other stakeholders in the area. In order to move forward and develop an effective TMA, the following steps are recommended for forming a TMA in NoMA¹.

- Engage the Community.
- Establishing Public and Private Funding Sources.
- Set Goals and Benchmarks Through a Business Plan.
- Establish Management of the TMA.
- Launch TMA Publicly.
- Develop TMA Activities.

Additional information about each of these steps is provided in Appendix E.

Areas Requiring Further Study

While this Plan resulted in numerous actionable recommendations, the Plan also identified several transportation issues too large (in physical size and/or complexity) to solve within the scope of the current study. For these areas, preliminary options and analysis were performed. However, further study and public participation is required to develop a preferred alternative. These studies should occur as soon as possible to allow for potential implementation of any resulting recommendations. Areas for further study include:

- Analyzing the connection between planned cycle tracks on L and Eye Streets west of the study area and the facilities and operational changes proposed in this plan on K Street and L Street. A central element in this connection will be to ensure bicycle connectivity around Mount Vernon Circle. This is identified as a key connection for bicycle continuity in Figure 8.
- Analyzing the potential for exclusive pedestrian phases at selected signalized intersections with high pedestrian volumes. Analysis should consider the benefits and/or impacts to all transportation modes.
- Analyzing the streets proposed as pedestrian priority zones in this Plan to explore potential design options. The study should include the

1 Material taken, in part, from the Guiding Principles for the Establishment of An Area-Wide TMA by Susan Philbin of the Sowton Transport Management Association: www.sowtonforum.org.uk/tma.htm.

potential to designate streets as pedestrian zones, the process for doing so, multimodal impacts and benefits, appropriate design considerations, and costs.

- Conducting a refined corridor analysis to identify the potential to convert K Street and L Street to one-way operations to improve traffic operations and provide opportunities for multimodal cross-section improvements. While this Plan identified several potential benefits of a couplet, issues for further analysis include:

- Use of M Street as part of the couplet.
- Shortening of the one-way couplet limits (e.g. 3rd Street NE).
- Impacts to movements on north-south streets.
- Potential advantages of K Street as one-way eastbound and L Street as one-way westbound.
- Impacts to neighborhoods to the east of the CSX tracks.
- Potential to designate West Virginia Avenue from New York Avenue to K Street and L Street as an alternative access route into and out of NoMA with trailblazing signing, pavement marking, and signal timing adjustments: The advantage of this route designation is to 1) educate people about existing alternative routes in and out of NoMA, and 2) to allow future traffic to and from NoMA to head to points east without using portions of Florida Avenue and NY Avenue, thus reducing the impact of future development projects and generated traffic within NoMA on NY Avenue.
- Potential to designate 4th and 6th Streets from Florida Avenue to Penn Street/ Brentwood Parkway as an alternative access route into and out of NoMA, with trailblazing signing, pavement marking, signal timing adjustments, and coordination with the Florida Avenue Market redevelopment project: The advantage of this route designation is to 1) educate people about existing alternative routes in and out of NoMA, and 2) to allow future traffic to and from NoMA to head to points east without using portions of New York Avenue and Florida Avenue, thus reducing the impact of future development

projects and generated traffic within NoMA on New York Avenue.

- Analyzing the proposed pedestrian and bicycle bridge connecting L Street over I-395. This analysis could include the planning and design of the bridge, as well as connections to and from it.
- Conducting a corridor analysis of Florida Avenue. This study would include ways to improve pedestrian and bicycle connections throughout the corridor, for example by potentially providing a sidepath on Florida Avenue and enhancing buffers between the sidewalk and the road. It could also incorporate recommendations from the Florida Avenue Market Plan, streetscape plans for Planned Unit Developments along Florida Avenue, and an analysis of a potential road diet from 2nd Street, NE to West Virginia Avenue.
- Conducting a more detailed design and engineering analysis for all of the intersections that are proposed to be realigned in this study, including North Capitol Street/Lincoln Road, NE, North Capitol Street/New York Avenue/N Street, P Street/Florida Avenue, N Street/Florida Avenue, West Virginia/Florida Avenue, and K Street/West Virginia Avenue.

MEDIUM-TERM RECOMMENDATIONS (BEFORE 2020)

Medium-term recommendations will be needed in the near future to support the NoMA transportation system. Unlike short-term items, medium-term recommendations may require larger capital outlays or additional study before implementation is feasible. While listed as “medium-term,” implementation of many of these recommendations should occur as soon as funding is available and analysis and design is complete. Implementation of medium-term projects will directly improve transportation conditions in targeted areas. In addition, they will create early successes for decision-makers to highlight, thus building momentum for the longer-term, more challenging recommendations of the Plan.

Medium-term recommendations are listed below. Chapter 3 provides detailed information for each recommendation:

- Providing six new traffic signals to improve

motor vehicle circulation and LOS throughout the study area.

- Adding exclusive pedestrian phases on Massachusetts Avenue at the intersections with North Capitol Street and 1st Street.
- Providing three new Pedestrian Hybrid Beacon signals.
- Realigning selected intersections to create more compact intersections with right-angle crossings, slow turning motor vehicles and improve visibility.
- Altering lane configurations, for example by adding right-turn only lanes, to maximize the operation and flow of traffic at intersections throughout the study area.
- Implementing an extension to the existing DC Circulator system to better serve NoMA. Note that this recommendation could potentially occur in the short term if there is a demonstrated ridership demand and if funding, potential shuttle consolidations, and other issues are addressed.
- Continue connecting a network of bicycle facilities throughout the study area including shared use paths, cycle tracks, bicycle lanes, and shared lane markings.
- Funding a NoMA Circulator (open to the general public) to provide neighborhood-wide access to high volume transit routes.
- Providing universal free transit passes to all employees. A universal pass is where all employees receive a free transit pass regardless of whether they ask for it.
- Conducting annual performance monitoring of commute trends within NoMA to monitor progress and identify additional TDM programs that will have the greatest benefits for the neighborhood.
- Managing on-street parking by implementing a “performance-pricing” strategy.
- Limiting increases in new off-street parking where possible.
- Identifying shared parking opportunities.

LONG-TERM RECOMMENDATIONS (BEFORE 2030)

Long-term recommendations are very important to improve NoMA’s transportation system and fully-achieve the goals for the study area set out in this Plan. However, by their nature most long-term improvements

will require several years before implementation is possible. Reasons include larger capital requirements, the need for more intensive study, and the contingency of certain improvements on future development. In many cases, future development will create both the need (i.e., travel demand) and potential (e.g., easements, funding, etc.) for construction of long-term improvements. While implementation of most of these recommendations will take 10- to 20-years, opportunities for implementation may occur sooner. DDOT and other stakeholders should take advantage these opportunities as they arise.

Long-term recommendations are listed below. Chapter 3 provides detailed information for each recommendation:

- Implementing a series of improvements along K, L, M, and First Streets in the NoMA neighborhood. Detailed recommendations for these roadways are provided in this Plan. While several options are discussed, a preferred alternative is identified for each of the key corridors, as noted below.
 - K Street and L Street: Implementing a “one-way pair” on K and L Streets should be considered. This would require converting L Street to one way westbound from West Virginia to 1st Street, NW and converting K Street to one way eastbound within the same limits. A cycle track on either K or L Street and an extension of L Street over the I-395 interchange could be completed in tandem with this change.
 - M Street: A cycle track is recommended on the south side of M Street. The addition of a Pedestrian Hybrid Beacon at New York Avenue, raised crosswalks, LPI’s, a new Smart Bike location, and covered and secure bike parking at the New York Avenue Metro Station are also recommended.
 - First Street: In the long-term a continuous shared use path on First Street is recommended connecting the Metropolitan Branch Trail and Union Station. In addition to lane configuration, parking, and traffic signal-related changes, a pedestrian priority curbside street on First Street outside of Union Station is also recommended.
- Implementing grid extensions, alternative

access routes, and one-way/ two-way traffic conversions to further improve access and circulation in NoMA. Improvements recommended in this Plan include:

- Converting one-way streets to two-way operations including New Jersey Avenue (from I Street to New York Avenue), 4th Street, NW (between K Street and New York Avenue) and M Street (between Florida Avenue and North Capitol Street).
- Designating West Virginia, 4th Street, and 6th Street as alternative access routes into and out of NoMA.
- Extending L Street (from North Capitol Street to New Jersey Avenue, and eventually across I-395 via a proposed pedestrian and bicycle bridge), and 2nd Street (from Florida Avenue to New York Avenue).
- Designating First Street in between Massachusetts Avenue and G Street as a pedestrian priority zone. In addition, this plan recommends an additional north/south pedestrian priority street in between First Street and North Capitol Street.

PLANNING LEVEL COST ESTIMATES

Planning-level cost estimates for the main components of this Plan were developed as part of the planning process. The estimated cost to implement the intersection recommendations is approximately \$7 million (based on 2010 dollars). The cost to implement the key corridor improvements is around \$5 million. Bicycle recommendations outside of the key corridors but still within the study area are estimated to cost around \$185,000. These general costs were developed by calculating rough quantities and applying unit costs. Costs were then translated into per mile or per facility costs. Detailed information on the cost estimates is provided in Appendix F.

FUNDING SOURCES

Developing a sustainable source of funding is necessary to budget for and implement construction and maintenance of the transportation network in NoMA and support the activities of the TMA. Use of Federal and District of Columbia transportation dollars will be necessary. Funds from budgets outside of DDOT can be used to supplement transportation

funds, especially when the project has a strong relationship to the mission of other agencies. Private sources of funding can also be key. Some components of the system may be built and paid for by developers. Contributions from foundations and local business can also be important, primarily for safety education and promotion programs or small-scale physical improvements. Funding sources that can support the implementation of this Plan include the following:

- Federal government
- DDOT
- NoMA BID
- Transportation Management Association (potentially drawing from proceeds on parking revenue)
- Private development
- Grants (TE, CMAQ, etc.)

PERFORMANCE MEASURES

One important aspect of achieving transportation goals in NoMA is establishing what success looks like and measuring NoMA against that standard. Performance measures and benchmarks allow for this process of evaluation to occur. One key function of the NoMA TMA will be to establish the set of performance measures and benchmarks to use for NoMA, and perform regular monitoring to understand whether or not goals are achieved. While a more detailed process is needed to establish specific performance measures, development of performance objectives should follow “SMART” principles:

- *Specific:* Provide sufficient specificity to guide formulation of viable approaches to achieving the objective without dictating the approach.
- *Measurable:* Include quantitative measurements, saying how many or how much should be accomplished. Tracking progress against the objective enables an assessment of effectiveness of actions.
- *Agreed:* Partners come to a consensus on a common objective. This is most effective when the planning process involves a wide-range of stakeholders to facilitate regional collaboration and coordination.
- *Realistic:* The objective can reasonably be accomplished within the limitations of resources and other demands. The objective may be a “stretch” and require substantial

coordination, collaboration, and investment to achieve. Because how realistic the objective is cannot be fully evaluated until after strategies and approaches are defined, the objective may need to be adjusted to be achievable.

- *Time-bound:* The objective identifies a time frame within which it will be achieved (e.g., “by 2014”).

Sample measures are outlined below to quantify the overall goals of the Plan and objectives described in each chapter. For each of these performance measures, DDOT will collect the data necessary to establish baseline measurements. It will be important to have adequate funding to collect the data required for these performance measures.

The performance measures should be evaluated on a semi-annual basis to ensure that they are the most appropriate, cost-effective measures for assessing progress toward Plan goals. DDOT’s performance measures should be coordinated and integrated with external monitoring efforts, such as those undertaken by the NoMA BID, WMATA, and other stakeholders.

Potential performance measures are listed below.

- Improvements to Level of Service at and along selected intersections and arterials.
- Number of covered and secure bicycle parking spaces provided.
- Number of TDM initiatives initiated.
- Number of selected facility types and intersection improvements provided (e.g. pedestrian crossing islands, HAWK signals, LPI’s, turning restrictions, etc.)
- Number of parking spaces shared.
- Revenue generated from potential parking tax and reinvested in multi-modal improvements in the study area

CONCLUSION

The implementation strategy described above will ensure that access, circulation, and mobility is maintained and enhanced for all modes of travel in the NoMA neighborhood. Implementing the strategy will improve conditions in NoMA today, while laying the groundwork for a future transportation network that supports projected changes in land uses, densities, and motor vehicle traffic volumes.



CONCLUSION

CONCLUSION

NoMA is rapidly transforming into one of the most exciting mixed use centers in the District of Columbia. While it is well-positioned for this change, there are tremendous constraints. The capacity of the existing transportation network is limited. Traffic congestion is already severe in many places and there is a concern that projected increases in motor vehicle traffic combined with unprecedented growth will result in poor quality of service for all modes of travel.

This Plan provides a framework for improving access, circulation, and mobility in NoMA. It identifies specific strategies for handling NoMA's expected growth and changing transportation needs. By providing strategies for managing congestion and mitigating potential conflicts between multi-modal users, it improves the safety, comfort and efficiency of all transportation modes. In doing so, it ensures that the transportation network will support and reinforce NoMA's emergence as a vibrant mixed-use center in the heart of the Nation's capital.





APPENDICES