

TRANSPORTATION IMPACT STUDY

TOTTEN MEWS PUD

4815 6TH STREET, NE

WASHINGTON, DC

July 10, 2015



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ZONING COMMISSION

District of Columbia

CASE NO.15-04

EXHIBIT NO.24A

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EXECUTIVE SUMMARY

The following report is a Transportation Impact Study (TIS) for the Totten Mews development at 4815 6th Street, NE, Lot 814 in Square 3788. This report reviews the transportation aspects of the Planned Unit Development (PUD) and zoning map amendment application. The Zoning Commission Case Number is 15-04.

The purpose of this study is to evaluate whether the PUD will generate a detrimental impact to the surrounding transportation network. The vehicular evaluation is based on a technical comparison of the existing conditions and two future conditions: 2018 future background conditions without the PUD, and 2018 future conditions with the PUD. The transit, pedestrian, and bicycle evaluations are based on a review of the existing surrounding infrastructure to determine their ability to accommodate the impacts of the proposed development. This report concludes that the PUD will not have a detrimental impact to the surrounding transportation network.

Proposed PUD

The Totten Mews PUD proposes to develop a vacant lot at the terminus of a private driveway extending from 6th Street NE with 40 residential townhomes. At present, a largely vacant lot used partially for school bus parking occupies the Totten Mews site. The residential development will be accessed via two (2) proposed entrances both located along 6th Street NE, which is private adjacent to the site. A private internal loop road flanked with the 40 proposed townhomes will connect the south entrance with the north entrance.

Pedestrian access will also be from 6th Street. A pedestrian path connects 6th Street near the site north to Emerson Street so that residents have a link to the Fort Totten Metro station and bus stops along South Dakota Avenue. Each townhome will have a single vehicle garage for residential parking. Additional parking will be available along the internal access roadway and along the east side of the private 6th Street extension. Loading activities, trash pickup, and deliveries would occur curbside from the internal loop road within the development.

Parking

The PUD will provide one (1) garaged parking space for each of the 40 townhomes. These 40 garage parking spaces equate to a parking ratio of one (1) space per unit. This amount of parking

is typical for this type of new residential development in the District. In addition, the driveway of each townhome has been designed to accommodate an additional vehicle and 17 on-street parking spaces will be available along the internal access roadway and along the east side of the private 6th Street extension.

Loading Activities

As mentioned previously, loading activities, trash pickup, and deliveries would occur curbside from the internal private loop road within the development.

Vehicular Impacts

The report includes an analysis of potential vehicular impacts of the Totten Mews PUD and recommendations for improvements and mitigation measures. The following conclusions are reached:

- The existing study area residential roadways operate under acceptable capacity conditions during the morning and afternoon peak hour.
- No background developments will have an origin or destination within the study area. The modest inherent growth rate applied to the adjacent 6th Street intersection with Buchanan Street would add few trips to the local streets and have little to no impact on their operation.
- The PUD is anticipated to generate 15 AM peak hour vehicular trips (3 inbound and 12 outbound) and 16 PM peak hour vehicular trips (11 inbound and 5 outbound), all of which will be oriented to the south on 6th Street since no connection of 6th Street is planned to the north from the development. DDOT's threshold for study of vehicular impacts of a site notes that any site generating more than 25 peak hour, peak direction trips should be examined to note any additional impacts. Since the 12 AM peak hour peak direction and 11 PM peak hour peak direction trips calculated for this development do not meet this threshold, the impacts associated are expected to be negligible.
- While DDOT standards do not require the study of vehicular impacts to the site, a review of the impact of site trips through the intersection closest to the site was undertaken and found that impacts attributable to the PUD are negligible and have no significant effect on the surrounding roadway network. The few site trips passing through the study intersection would be dissipated into a maximum of a few trips per turning movement once reaching major roadways.



- The Totten Mews PUD will have no detrimental impacts to the study area.

Transit

The following summarizes the site's access to transit and the expected site impacts:

- The site is served by the Metrorail Red, Yellow, and Green Lines via the Fort Totten Station located approximately a half mile from the site, and four Metrobus routes that travel along South Dakota Avenue, Gallatin Street, and Taylor Street. The closest of these Metrobus routes to the site travels along South Dakota Avenue (Route 80), approximately four tenths of a mile from the site.
- The site is anticipated to generate 10 transit person trips in the AM peak hour and 11 transit person trips in the PM peak hour. All of these are anticipated to use the pedestrian walkway connecting the site north of 6th Street to the Fort Totten Metro Station and the closest bus stops along South Dakota Avenue.
- Transit-trips generated by the site will not have a detrimental impact on the surrounding transit system.

Pedestrian

Based on an analysis of the existing pedestrian conditions, a review of the background improvements, and planned site design elements, the following conclusions were made:

- Some deficiencies are present along the pedestrian paths from the site to the Fort Totten Metro Station and local bus stops. Mostly the sidewalks are narrow due to the low-density residential characteristics of the neighborhood. Additionally, some street sections only provide sidewalks on one side of the street, and some crossings lack crosswalks and/or curb ramps within the residential neighborhood. Most notably along the potential pedestrian route from the development to the Ft. Totten Metro Station, deficient and missing sidewalks were noted along Emerson Street and 6th Place and deficient and missing curb ramps were noted at the Emerson Street/6th Place and Gallatin Street/6th Place intersections.
- Despite the noted deficiencies, the pedestrian routes from the site are mostly located along low-volume, low-speed residential streets, and thus provide safe connections to local transit facilities.

- Pedestrians headed to the Fort Totten Metro Station from the site presently are intended to utilize South Dakota Avenue to walk north from Gallatin Street before heading west on Galloway Street. However, existing counts collected at 6th Place and Gallatin Street indicate that current residents are also utilizing a dirt path through the park north of the site to connect to Galloway Street.
- The site is anticipated to generate 2 pedestrian person trips in the AM peak hour and 2 pedestrian person trips in the PM peak hour. These trips are in addition to the 10 transit trips in the AM peak hour and the 11 transit trips in the PM peak hour that are anticipated to initially leave the site as pedestrian trips. All of these are anticipated to use the pedestrian walkway connecting the site north of 6th Street to the Fort Totten Metro Station and the closest bus stops along South Dakota Avenue.
- This report recommends the installation of new curb ramps and crosswalks at the Emerson Street/6th Place intersection and a crosswalk at the Gallatin Street/6th Place intersection.

Bicycle

The bicycle facilities within the study area were evaluated and the following conclusions were made in regards to the existing and proposed bicycle facilities and the overall impact of the site on bicycle infrastructure:

- Near the site, bicyclists would likely use the low-volume, low-speed residential streets as safe connectors to designated bike lanes and trails in the vicinity. While few bicycle facilities exist to the north and east of the site, the off-street trail that runs north-south parallel to John McCormack Road on the opposite side of the Metrorail from the PUD would provide residents a safe connection to Union Station to the south.
- New protected bicycle infrastructure will likely be implemented near the site in the coming years that will further improve the cycling conditions in the area. DDOT anticipates that these new infrastructure improvements will result in a five percent bicycle mode share for Totten Mews residents.
- Residents of the development will be able to securely store any personal bicycles within their garages or townhomes. In addition, bicycle parking racks are planned to be located throughout the development.
- Given the existing and proposed bicycle infrastructure in the study area, the site-generated bicycle trips will not result in detrimental impacts to the bicycle system.

INTRODUCTION

This report is a Transportation Impact Study (TIS) for the proposed Totten Mews Planned Unit Development (PUD) located at the terminus of 6th Street north of Buchanan Street, in the Northeast quadrant of Washington DC. This TIS is submitted into the Zoning Commission record for this case, as an evaluation of the transportation impacts of construction of the application. The Zoning Commission Case Number is 15-04.

Contained within this report are a review of the transportation components of the application and the development's transportation impacts.

PROJECT SUMMARY

The site is located at the terminus of an existing private roadway extending from 6th Street NE north of Buchanan Street NE, Lot 814 in Square 3877. The development will replace an existing vacant lot partially used to park school buses with 40 residential townhomes each containing one garaged parking space.

Pedestrian access will be from 6th Street. Two site driveways are proposed from 6th Street for vehicular access, and will be connected internally by a loop road flanked by the townhomes. Loading activities, deliveries, and trash pickup would occur curbside from the internal loop road.

The Applicant has committed to improving the streetscape immediately west of the site with a sidewalk and street trees complying with DDOT standards.

PURPOSE OF STUDY

This report reviews the transportation elements of the PUD, supplementing material provided in the Site Plan Package that accompanied the Zoning Commission Application. Additionally, this report determines whether the construction of the PUD will or will not lead to adverse impacts on the transportation network. This is accomplished by comparing one existing condition and two future scenarios: (1) 2018 future background conditions without the PUD and (2) 2018 future conditions with the PUD completed. A review of the existing surrounding transit, pedestrian, and bicycle infrastructure has also been included to determine their ability to accommodate the impacts of the proposed development.

The methodologies and analyses contained within this report are tailored to reach a conclusion on the impact of the PUD, and thus this report is not a general neighborhood study that makes recommendations to solve all existing and predicted transportation concerns near the project. Nevertheless, some discussions within this report do discuss non-project generated impacts including planning level suggestions on improvements.

This TIS bases what it considers acceptable conditions for transportation services on typical standards for urban environments. This means that during a roadway's (or other piece of infrastructure) peak hours of use, it is processing users efficiently and generating the most positive impact for resources dedicated. In other words, when a road has the most cars on it, the desire is for that road to be just under (or at) its capacity limit. Unacceptable conditions result when a roadway is not operating efficiently, either through too high of a delay at peak times, or having unused capacity at peak times.

Additionally, this TIS attempts to strike a balance between modes of travel when making recommendations on transportation improvements. For example, roadway widening including turn lanes will typically have negative impacts to pedestrian and bicycle modes, and sometimes to transit. This report approaches its recommendations with this context in mind, only suggesting improvements when it is necessary to mitigate unnecessary conditions on one mode without negatively impacting another.

CONTENTS OF STUDY

This report contains seven sections as follows:

- *Study Area Overview*
This section reviews the area near and adjacent to the proposed project and includes an overview of the site location.
- *Project Design*
This section reviews the transportation components of the PUD, including the site plan and access.
- *Trip Generation*
This section outlines the travel demand of the proposed PUD. It summarizes the proposed trip generation of the project.
- *Traffic Operations*
This section provides a summary of the existing roadway facilities and an analysis of the existing and future roadway capacity in the study area. This section highlights the

vehicular impacts of the project, including presenting mitigation measures for minimizing impacts.

- Transit

This section summarizes the existing and future transit service adjacent to the site, reviews how the project's transit demand will be accommodated, outlines impacts, and presents recommendations as needed.

- Pedestrian Facilities

This section summarizes existing and future pedestrian access to the site, reviews walking routes to and from the project site, outlines impacts, and presents recommendations as needed.

- Bicycle Facilities

This section summarizes existing and future bicycle access to the site, reviews the quality of cycling routes to and from the project site, outlines impacts, and presents recommendations as needed.

- Summary and Conclusions

This section presents a summary of the recommended mitigation measures by mode and presents overall report findings and conclusions.

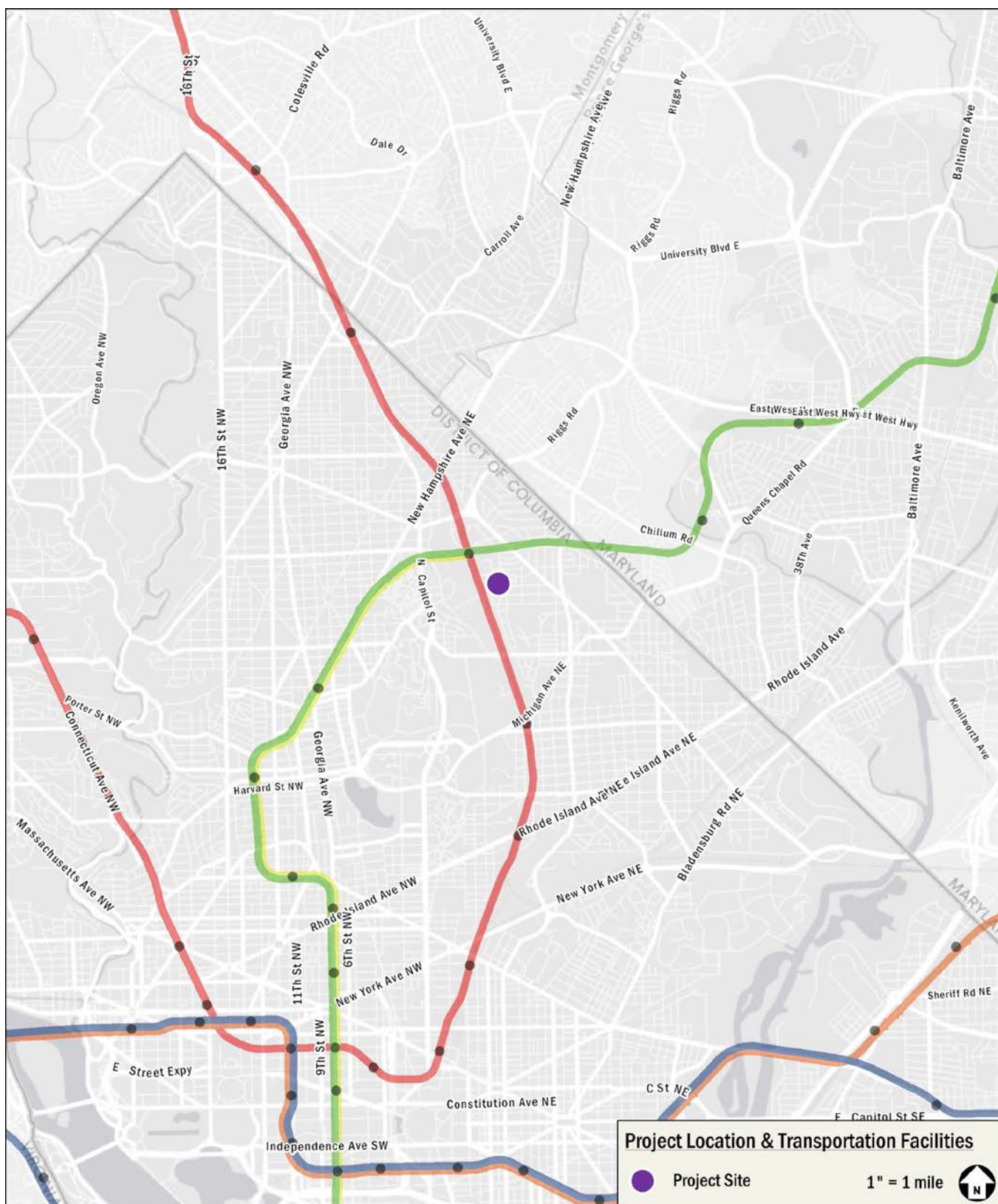


Figure 1: Site Location



STUDY AREA OVERVIEW

This section reviews the study area and includes an overview of the site location, including a summary of the major transportation characteristics of the area and of future regional projects.

The following conclusions are reached within this chapter:

- The site is surrounded by an extensive regional and local transportation system.
- Future pedestrian facilities and bicycle facilities will improve resident access to the Fort Totten Metro station and other non-auto modes of transportation.
- Within the study area, walking and cycling conditions are generally good. There are some gaps in the network; however, these are recognized and other initiatives have been implemented to alleviate some of these issues.

MAJOR TRANSPORTATION FEATURES

Overview of Regional Access

The Totten Mews site has access to regional vehicular- and transit-based transportation options, as shown in Figure 3, that connect the site to destinations within the District, Virginia, and Maryland.

The site is regionally accessible nearby from South Dakota Avenue, New Hampshire Avenue, and North Capitol Street. These roadways also connect the site to the Capital Beltway (I-495) that surrounds Washington, DC and its inner suburbs. All of these roadways bring vehicular traffic within a few miles of the site, at which point arterials and local roads can be used to access the site directly.

The Fort Totten Metrorail Red, Yellow, and Green Line station is located an approximately half mile walk from the development site. The Red Line travels south from Shady Grove, travels through downtown DC, and continues north to Glenmont. The Green Line travels north from Branch Avenue, through downtown DC, and continues north to Greenbelt. The Yellow Line travels north from Huntington (and Franconia/Springfield during peak hours) through downtown DC and alternates between terminating at Mount Vernon Square, Fort Totten, and Greenbelt depending on the time of day and day of the week.

Overall, the site has access to several regional roadways and transit options, making it convenient to travel between the site and destinations in the District, Virginia, and Maryland.

Overview of Local Access

There are several local transportation options near the site that serve vehicular, transit, walking, and cycling trips, as shown on Figure 4. The site is served by a local vehicular network that includes several primary and minor arterials such as South Dakota Avenue, New Hampshire Avenue, and North Capitol Street. In addition, there is an existing network of connector and local roadways that provide direct access to the site.

The Metrobus system provides local transit service in the vicinity of the site. As shown in Figure 4, there are four bus routes traveling along the South Dakota Avenue corridor. These bus lines connect the site to many areas of the District including several Metrorail stations.

The site is near the Metropolitan Branch Trail that provides an eight mile, multi-use trail between Union Station and Silver Spring, MD. Although there are some high-volume roadways near the site, such as South Dakota Avenue, the majority of the bicycle facilities can be accessed via local and residential roadways that facilitate cycling.

The site is situated at the terminus of a private roadway extension from 6th Street south of the site. While no pedestrian connection to Emerson Street and 6th Street north of the site currently exists, a pedestrian pathway is planned in conjunction with the site to connect these areas. Pedestrian facilities within the area generally provide safe walking conditions, however some sidewalks are substandard and some curb ramps and crosswalks are either substandard or missing.

Overall, the Totten Mews site is surrounded by an extensive local network that allows for efficient transportation options via transit, bicycle, walking, or vehicular modes.

Car-sharing and Ridesharing

Three car-sharing companies provide service in the District: Zipcar, Enterprise Carshare, and Car2Go. All three services are private companies that provide registered users access to a variety of automobiles. Of these, Zipcar and Enterprise Carshare have designated spaces for their vehicles. Carshare locations located within a half-mile of the site are listed in Table 1.

Car-sharing is also provided by Car2Go, which provides point-to-point car sharing. Unlike Zipcar or Enterprise, which require two-way trips, Car2Go can be used for one-way rentals. Car2Go currently has a fleet of vehicles located throughout the District. Car2Go vehicles may park in any non-restricted metered curbside parking space or Residential Parking Permit (RPP) location in any zone throughout the defined “Home Area”. Members do not have to pay the meters or pay stations. Car2Go does not have permanent designated spaces for their vehicles; however availability is tracked through their website, which provides an additional option for car-sharing patrons.

- Water taxis

The property is also located within several ridesharing service areas, including Uber, Lyft and Sidecar. These ridesharing services provide an abundance of on-demand transportation options to destinations throughout Washington, DC.

FUTURE REGIONAL PROJECTS

There are several District initiatives and background developments located in the vicinity of the site. These planned and proposed projects are summarized below.

Local Initiatives

moveDC: Multimodal Long-Range Transportation Plan

MoveDC is an implementation-based plan that provides a vision for the future of DC’s transportation system. As the District grows, so must the transportation system, specifically in a way that expands transportation choices while improving the reliability of all transportation modes.

The *moveDC* report outlines recommendations by mode with the goal of completing them by 2040. The plan hopes to achieve a transportation system for the District that includes:

- 70 miles of high-capacity transit (streetcar or bus)
- 200 miles of on-street bicycle facilities or trails
- Sidewalks on at least one side of every street
- New street connections
- Road management/pricing in key corridors and the Central Employment Area
- A new downtown Metrorail loop
- Expanded commuter rail

Table 1: Summary of Carshare Locations

Carshare Location	Number of Vehicles
Behind 5000 Fort Totten Dr. NE (Zipcar)	1 Vehicle
In Front of Flather Hall - John McCormick Road NE (Catholic University) (Zipcar)	1 Vehicle
Fort Totten Metro (Enterprise Carshare)	4 Vehicles
Total	6 Vehicles

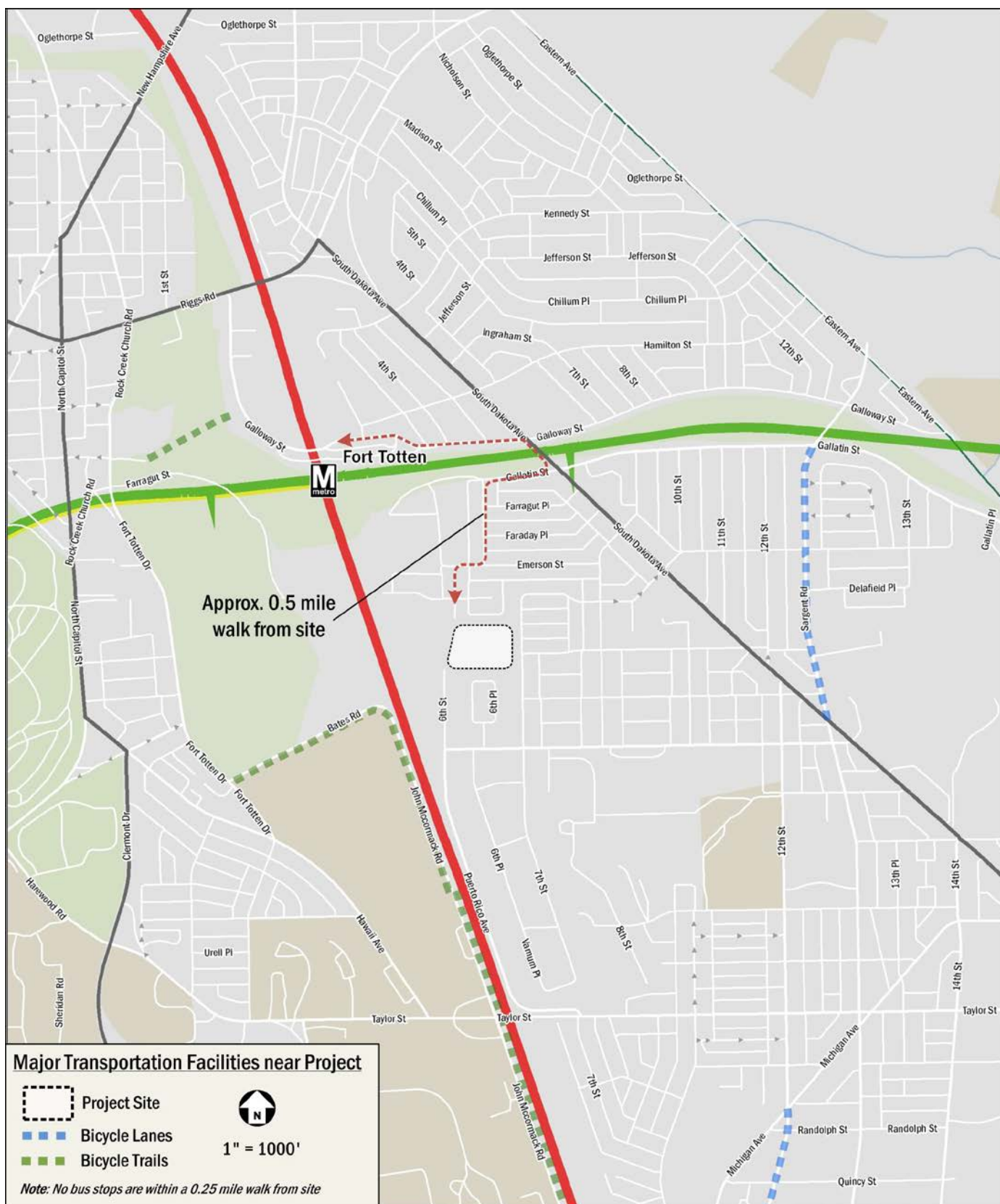


Figure 2: Major Regional Transportation Facilities

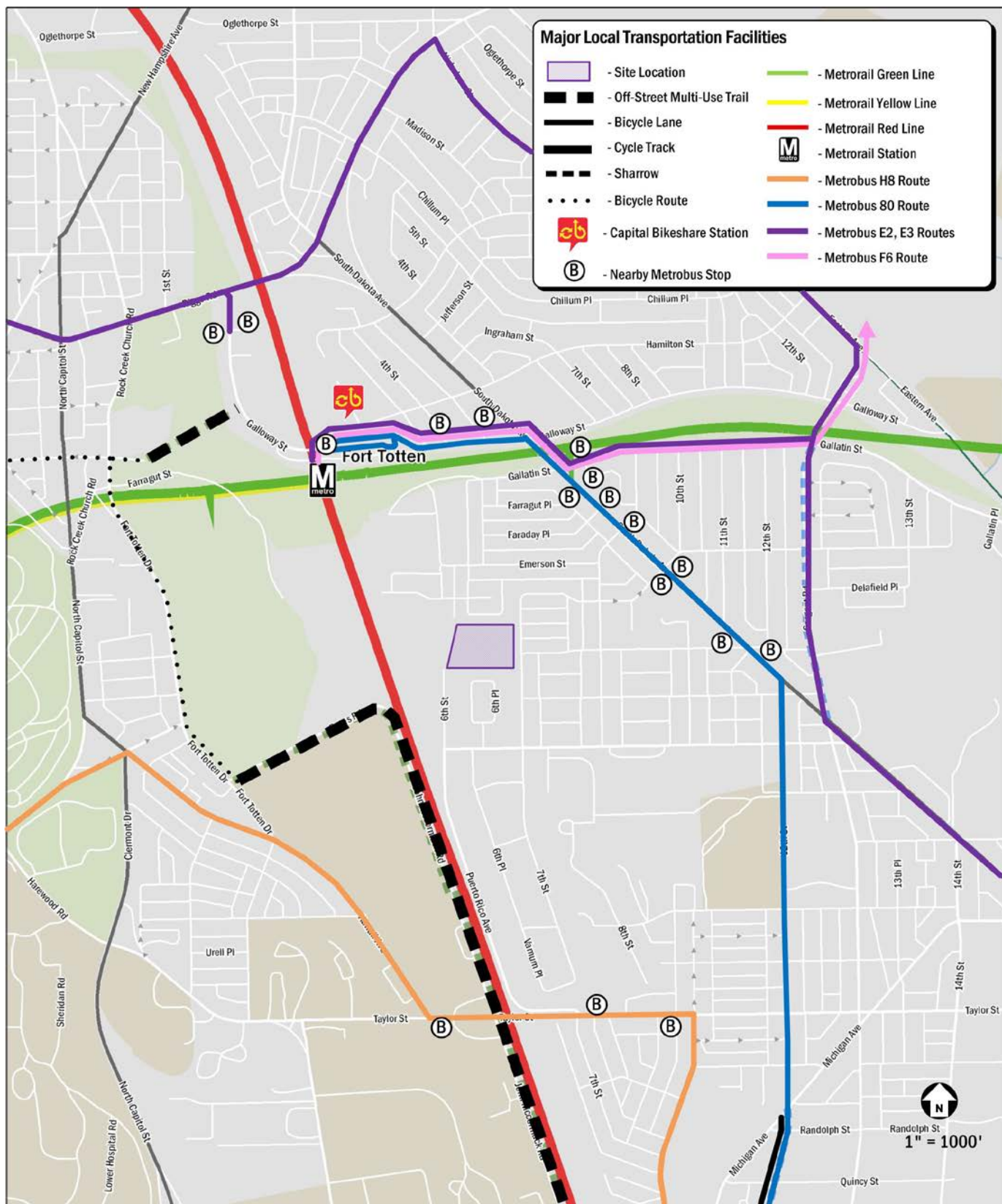


Figure 3: Major Local Transportation Facilities

PROJECT DESIGN

This section reviews the transportation components of the Totten Mews PUD, including the proposed site plan and access. It includes descriptions of the site's vehicular access, loading, and parking.

OVERVIEW

The Totten Mews PUD proposes to develop a vacant lot at the terminus of a private roadway extending from 6th Street NE with 40 residential townhomes. At present, a largely vacant lot used partially for school bus parking occupies the Totten Mews site. The residential development will be accessed via two (2) proposed entrances both located along 6th Street NE, which is private adjacent to the site. A private internal loop road flanked with the 40 proposed townhomes will connect the south entrance with the north entrance.

Pedestrian access will also be from 6th Street. A pedestrian path will connect 6th Street near the site north to Emerson Street so that residents have a link to the Fort Totten Metro station and bus stops along South Dakota Avenue. Each townhome will have a single vehicle garage for residential parking. Additional parking will be available along the internal access roadway and along the east side of the private 6th Street extension. Loading activities, trash pickup, and deliveries would occur curbside from the internal loop road within the development.

PARKING

The PUD will provide one (1) garaged parking space for each of the 40 townhomes. These 40 garage parking spaces equate to a parking ratio of one (1) space per unit. This amount of parking is typical for this type of new residential townhome development in the District and satisfies zoning requirements of one space for every unit. In addition, the driveways of each townhome have been designed to accommodate an additional vehicle and 17 on-street parking spaces will be available along the internal access roadway and along the east side of the private 6th Street extension.

LOADING

Loading accommodations provided in the PUD is adequate to serve the expected loading demand. Zoning Regulations do not require dedicated loading facilities for developments of fewer than 50 units. However, the PUD proposes to accommodate

loading via the driveways of the individual townhomes and the private road within the development itself.

Based on loading operations noted at other developments, the Totten Mews PUD is anticipated to see approximately 3-4 trucks per day, which will primarily be USPS/FedEx/UPS deliveries and trash pick-up. Given the size of the development, move-in/move-out activities are anticipated to be occasionally and no more than one every two weeks (conservatively).

BICYCLE PARKING

Zoning Regulations do not require separate bicycle parking for townhomes, however, residents are anticipated to store bicycles at each individual townhome. In addition, bicycle racks will be placed throughout the development to accommodate the short-term bicycle parking of residents and visitors.



Figure 4: Site Plan

TRIP GENERATION

This section outlines the transportation demand of the proposed Totten Mews PUD. It summarizes the projected trip generation of the site by mode, which forms the basis for the chapters that follow.

Traditionally, weekday peak hour trip generation is calculated based on the methodology outlined in the Institute of Transportation Engineers' (ITE) *Trip Generation Manual*, 9th Edition. This methodology was supplemented to account for the urban nature of the site (the *Trip Generation Manual* provides data for non-urban, low transit use sites) and to generate trips for multiple modes.

Residential trip generation was calculated based on ITE land use 230, Townhome, with mode splits developed in consultation with DDOT using census data and other local data.

As such, the development is anticipated to generate 15 AM peak hour trips (3 inbound and 12 outbound) and 16 PM peak hour trips (11 inbound and 5 outbound). DDOT CTR guidelines require vehicular analysis of developments that generate more than 25 peak hour peak direction trips to determine the vehicular impacts of the development. Given that the Totten Mews PUD is anticipated to generate 12 AM peak hour peak direction trips and 11 PM peak hour peak direction trips, this development does not meet the DDOT CTR threshold for additional vehicular study. However, at the request of the neighborhood, additional vehicular study has been included as noted in the following section.

A summary of the multimodal trip generation is provided in Table 3. Detailed calculations are included in included in the Technical Appendix.

Table 2: Peak Hour Trip Generation

Step 1: Base trip generation using ITEs' <i>Trip Generation</i>								
Land Use	Land Use Code	Quantity	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Townhomes	230	40 du	4 veh/hr	21 veh/hr	25 veh/hr	19 veh/hr	9 veh/hr	28 veh/hr
Step 2: Convert to people per hour, before applying mode splits								
Land Use	People/Car (from 2009 NHTS, Table 16)		AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Townhomes	1.13 ppl/veh		5 ppl/hr	24 ppl/hr	28 ppl/hr	21 ppl/hr	10 ppl/hr	32 ppl/hr
Step 3: Split between modes, per assumed Mode Splits								
Land Use	Mode	Split	AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Townhomes	Auto	55%	3 ppl/hr	13 ppl/hr	16 ppl/hr	12 ppl/hr	6 ppl/hr	18 ppl/hr
Townhomes	Transit	34%	2 ppl/hr	8 ppl/hr	10 ppl/hr	8 ppl/hr	3 ppl/hr	11 ppl/hr
Townhomes	Bike	5%	1 ppl/hr	1 ppl/hr	2 ppl/hr	2 ppl/hr	0 ppl/hr	2 ppl/hr
Townhomes	Walk	6%	1 ppl/hr	1 ppl/hr	2 ppl/hr	2 ppl/hr	0 ppl/hr	2 ppl/hr
Step 4: Convert auto trips back to vehicles/hour								
Land Use	People/Car (from 2009 NHTS, Table 16)		AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Townhomes	1.13 ppl/veh		3 veh/hr	12 veh/hr	15 veh/hr	11 veh/hr	5 veh/hr	16 veh/hr
Trip Gen Summary for Residential								
Mode			AM Peak Hour			PM Peak Hour		
			In	Out	Total	In	Out	Total
Auto			3 veh/hr	12 veh/hr	15 veh/hr	11 veh/hr	5 veh/hr	16 veh/hr
Transit			2 ppl/hr	8 ppl/hr	10 ppl/hr	8 ppl/hr	3 ppl/hr	11 ppl/hr
Bike			1 ppl/hr	1 ppl/hr	2 ppl/hr	2 ppl/hr	0 ppl/hr	2 ppl/hr
Walk			1 ppl/hr	1 ppl/hr	2 ppl/hr	2 ppl/hr	0 ppl/hr	2 ppl/hr

TRAFFIC OPERATIONS

This section provides a summary of the existing roadway facilities, as well as an analysis of the existing and future roadway capacity in the study area. Included is an analysis of potential vehicular impacts of the Totten Mews PUD and recommendations for improvements and mitigation measures.

The purpose of the capacity analysis is to:

- Determine the existing capacity of the study area roadways;
- Determine the overall impact of the Totten Mews PUD on the study area roadways;
- Discuss potential improvements and mitigation measures to accommodate the additional vehicular trips; and
- Evaluate the proposed roadway network to determine if adequate capacity is provided in the future.

This analysis was accomplished by determining the traffic volumes and roadway capacity for the following scenarios:

- 2015 Existing Conditions
- 2018 Background Conditions (without the Totten Mews PUD)
- 2018 Total Future Conditions (with the Totten Mews PUD)

The capacity analysis focuses on the morning and afternoon commuter peak hours, as determined by the existing traffic volumes in the study area.

The following conclusions are reached within this chapter:

- The existing study area roadways generally operate under acceptable conditions during the morning and afternoon peak hours.
- The addition of inherent growth on the study area roadways has a negligible impact on the study area roadways.
- Impacts attributable to the PUD are minimal and have no significant effect on the surrounding roadway network.
- The Totten Mews PUD will have no detrimental impacts to the study area. No study intersections operate under unacceptable conditions following the construction of the PUD that do not also operate under unacceptable conditions in the future without the proposed PUD.

ROADWAYS

As outlined previously, regionally the site is accessible nearby from South Dakota Avenue, New Hampshire Avenue, and North Capitol Street. These roadways also connect the site to the Capital Beltway (I-495) that surrounds Washington, DC and its inner suburbs. All of these roadways bring vehicular traffic within a few miles of the site, at which point arterials and local roads can be used to access the site directly.

STUDY AREA, SCOPE, & METHODOLOGY

This section outlines the vehicular trips generated in the study area along the vehicular access routes and defines the analysis assumptions.

The scope of the analysis contained within this report was discussed with and agreed to with the District Department of Transportation (DDOT). The general methodology of the analysis follows national and DDOT guidelines on the preparation of transportation impact evaluations of site development.

Capacity Analysis Scenarios

The vehicular analyses are performed to determine if the proposed development of the Totten Mews PUD will lead to adverse impacts on traffic operations. (A review of impacts to each of the other modes is outlined later in this report.) This is accomplished by comparing two future scenarios: (1) without the proposed application (referred to as the Background conditions) and (2) with the application approved and constructed (referred to as the Future conditions).

Specifically, the roadway capacity analysis examined the following scenarios:

- Existing Conditions
- 2018 Background Conditions (without the Totten Mews PUD)
- 2018 Total Future Conditions (with the Totten Mews PUD)

The capacity analysis focuses on the morning and afternoon commuter peak hours, as determined by the existing traffic volumes in the study area.

Study Area

The study area of the analysis is a set of intersections where detailed capacity analyses are performed for the scenarios

listed above. The set of intersections decided upon during the study scoping process with DDOT are those intersections most likely to have potential impacts or require changes to traffic operations to accommodate the proposed development. Although it is possible that impacts will occur outside of the study area, those impacts are not significant enough to be considered a detrimental impact nor worthy of mitigation measures.

Based on the projected future trip generation and the location of the site access points the Buchanan Street/6th Street/Puerto Rico Avenue intersection was noted to be the intersection most likely to be impacted by site traffic and should be study. It should continue to be noted that DDOT CTR guidelines do not require additional vehicular analysis of this development since the trip generation is anticipated to be well below thresholds noted to expect significant impacts.

Traffic Volume Assumptions

The following section reviews the traffic volume assumptions and methodologies used in the roadway capacity analyses.

Existing Traffic Volumes

The existing traffic volumes are comprised of turning movement count data. The results of the traffic counts, including the peak hour traffic volumes, are shown in the Technical Attachments.

2018 Background Traffic Volumes (without the Totten Mews PUD)

The traffic projections for the 2018 Background conditions consist of the existing volumes with additional growth. No nearby background developments that would impact the study intersection were noted. While no background developments were noted in the area that would impact the study intersection, regional traffic growth is typically accounted for

using percentage growth rates and has been accounted for using a 0.25 percent annual growth rate, compounded annually, based on DDOT annual traffic data collected on Buchanan Street.

2018 Future Traffic Volumes (with the Totten Mews PUD)

The 2018 Future traffic volumes consist of the 2018 Background volumes with the addition of the traffic volumes generated by the proposed development (site-generated trips). Thus, the 2018 Future traffic volumes include traffic generated by: the existing volumes, the inherent growth on the study area roadways, and the proposed Totten Mews PUD.

Existing traffic volumes and travel patterns in the study area were analyzed in order to determine the trip distribution for the site-generated trips. Based on this review and the existing site access locations, the site-generated trips were distributed through the study area intersections. Figure 5 shows a summary of the trip distribution and site-generated trips. The site-generated traffic volumes and the peak hour traffic volumes for the 2018 Future conditions are shown in the Technical Attachments.

Geometry and Operations Assumptions

The following section reviews the roadway geometry and operations assumptions made and the methodologies used in the roadway capacity analyses.

Existing Geometry and Operations Assumptions

The geometry and operations assumed in the existing conditions scenario are those present when the main data collection occurred. Gorove/Slade made observations and confirmed the existing lane configurations and traffic controls at the study intersection. The lane configurations and traffic controls for the Existing conditions are shown in the Technical Attachments.

2018 Background Geometry and Operations Assumptions

Following national and DDOT methodologies, a background improvement must meet the following criteria to be incorporated into the analysis:

- Be funded; and
- Have a construction completion date prior or close to the proposed development.

As such, no contemplated improvements at the study intersection meet these criteria for background improvements. The lane configurations and traffic controls for the 2018 Background conditions are shown in the Technical Attachments.

2018 Future Geometry and Operations Assumptions

The lane configurations for the 2018 Future conditions are based on the lane configurations for the 2018 Background conditions. The lane configurations and traffic controls for the 2018 Future conditions are shown in the Technical Attachments.

Analysis Methodology

Following DDOT guidelines, the capacity analyses were performed using *Highway Capacity Manual* (HCM) methodologies. For signalized and unsignalized intersections, the HCM calculates the delay experienced by drivers traveling through an intersection. This delay is associated with vehicles slowing in advance of an intersection, the time spent stopped at an intersection, the time spent as vehicles move up in the queue, and the time needed to vehicles to accelerate to the speed limit. Traffic delay also results from the interaction of vehicles, primarily in a state where the traffic volumes exceed the available capacity.

The results of these delay calculations is a computed average delay (seconds per vehicle) for each approach and a Level of Service (LOS) grade. At unsignalized intersections, the approaches controlled by a stop-sign have a calculated average delay and associated LOS. For all-way stop intersections, an overall average delay and LOS are also determined. For one- or two-way stop intersections, an average delay and LOS are also calculated for vehicles turning across a free-flowing approach, as the driver must yield to oncoming traffic. The major through movements and right-turns on free-flowing approaches at one- or two-way stop controlled intersections are assumed to operate with no delay.

Level of Service (LOS)

Level of service is based upon the traffic volume present in each lane on the roadway, the capacity of each lane at the intersection and the delay associated with each directional movement. The HCM defines six levels of service, ranging from A to F. LOS A represents the “best” operating conditions from a traveler’s perspective (free-flowing conditions and little-to-no delay), and LOS F represents the “worst”. Detailed LOS descriptions are contained in the Technical Attachments.

For cost, feasibility, and environmental impact, roadways are not typically designed to provide LOS A conditions during peak periods. Instead, roadways are typically designed to reflect a balance between individual traveler’s desires, society’s desires, and financial resources. In suburban areas, roadways are typically designed to a peak hour threshold of LOS D. In urban areas, such as the District, LOS E is typically used as the acceptable peak hour LOS threshold. Nevertheless, during low-volume periods of the day, a roadway or intersection may operate at LOS A.

For this report, the analysis was performed using the *Synchro*, Version 7 software package, which is based on the HCM methodologies. As stated previously, the weekday morning and afternoon peak hours were analyzed in the Existing, Background, and Future conditions. The *Synchro* models were compiled using signal timings provided by DDOT and with lane configurations and traffic volumes collected by Gorove/Slade.

Capacity Analysis Results

The results of the capacity analyses are expressed in level of service (LOS) and delay (seconds per vehicle) for each approach. The detailed capacity analysis tables and worksheets are contained in the Technical Attachments.

Generally speaking, the proposed development is considered to have an impact at an intersection within the study area if the capacity analyses show an LOS E at an intersection or along an approach in the Future conditions where one does not exist in the Background conditions. Following these guidelines, the proposed Totten Mews PUD will not have any significant additional impacts to the roadway network.

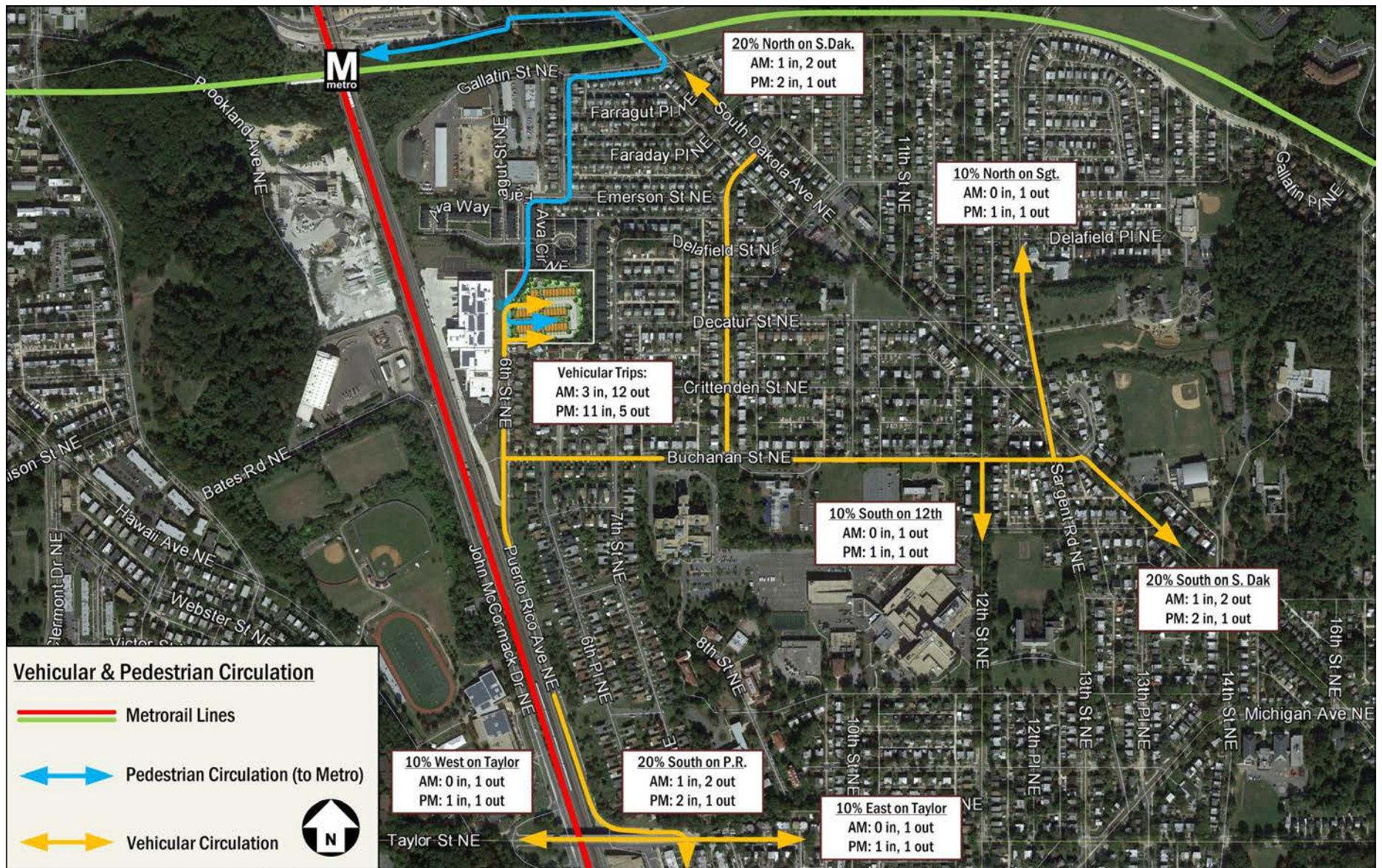


Figure 5: 2018 Future Peak Hour Vehicular Distribution and Pedestrian Circulation



TRANSIT

This section discusses the existing and proposed transit facilities in the vicinity of the site, accessibility to transit, and evaluates the overall transit impacts due to the Totten Mews development.

The following conclusions are reached within this chapter:

- The site is served by the Metrorail Red, Yellow, and Green Lines via the Fort Totten Station and four Metrobus routes that travel along South Dakota Avenue.
- Transit-trips generated by the site are not expected to have a detrimental impact on the surrounding transit system.

EXISTING TRANSIT SERVICE

The study area is well served by Metrorail and Metrobus. Combined, these transit services provide local, city wide, and regional transit connections and link the site with major cultural, residential, employment, and commercial destinations throughout the region. Figure 10 identifies the major transit routes, stations, and stops in the study area.

The Fort Totten Metrorail Red, Yellow, and Green Line station is located an approximately half mile walk from the development site. The Red Line travels south from Shady Grove, travels through downtown DC, and continues north to Glenmont. The Green Line travels north from Branch Avenue, through downtown DC, and continues north to Greenbelt. The Yellow Line travels north from Huntington (and Franconia/Springfield during peak hours) through downtown DC and alternates between terminating at Mount Vernon Square, Fort Totten, and Greenbelt depending on the time of day and day of the

week. Trains run approximately every three minutes during the morning and afternoon peak hours. Trains run about every 5 to 6 minutes during weekday non-peak hours, every 10 to 15 minutes on weekday evenings after 7:00 pm and 6 to 15 minutes on the weekends.

The site is also serviced by Metrobus along South Dakota Avenue, Gallatin Avenue, and at the Fort Totten Metro Station. The routes serving this area connect the site to many stations in the Metrorail system and with various locations throughout all quadrants of the District. Table 4 shows a summary of the bus route information for the four routes that serve the site nearby along South Dakota Avenue, including service hours, headway, and distance to the nearest bus stop. The nearest bus stops are located approximately one third of a mile from the site on South Dakota Avenue at 8th Street, Farragut Place, and Gallatin Street, none of which offer bus shelters.

SITE-GENERATED TRANSIT IMPACTS

The trip generation estimates for the Totten Mews development show that a minimal amount of new transit riders will be generated. The proposed development is projected to generate 10 transit trips (2 inbound, 8 outbound) during the morning peak hour and 11 transit trips (7 inbound, 3 outbound) during the afternoon peak hour.

Table 3: Metrobus Route Information

Route Number	Route Name	Service Hours	Headway	Distance to Nearest Stop
80	North Capitol Street Line	Weekdays: 4:56 am - 2:16 am Saturdays: 5:31 am - 2:25 am Sundays: 5:55 am - 12:41 am	Peak: 7-16 min Non-Peak: 13-30 min Weekend: 16-35 min	0.3 miles (6 minutes)
E2, E3	Military Road - Crosstown Line	Weekdays: 4:55 am - 1:26 am Saturdays: 5:16 am - 1:23 am Sundays: 5:02 am - 12:22 am	Peak: 9-12 min Non-Peak: 14-32 min Weekend: 20-34 min	0.4 miles (8 minutes)
F6	New Carrollton - Fort Totten Line	Weekdays: WB 5:52 am - 10:18 pm Weekdays: EB 5:34 am - 9:35 PM	4-60 min	0.4 miles (8 minutes)



PEDESTRIAN FACILITIES

This section summarizes the existing and future pedestrian access to the site and reviews walking routes to and from the site. Overall, the majority of pedestrian facilities in the study area provide a friendly pedestrian environment.

PEDESTRIAN STUDY AREA

This TIS evaluated pedestrian facilities within a quarter-mile of the site and pedestrian routes to nearby transit facilities. The site is easily accessible to transit options such as bus stops on South Dakota Avenue and the Fort Totten Metrorail Station. There are some barriers and areas of concern within the study area that negatively impact the quality and attractiveness of the walking environment, including narrow or nonexistent sidewalks and incomplete or insufficient crossings at intersections.

SURROUNDING PEDESTRIAN INFRASTRUCTURE

This section outlines the existing and proposed pedestrian infrastructure surrounding the development.

Existing Conditions

A review of pedestrian facilities surrounding the site shows that many facilities meet DDOT standards and provide a quality walking environment. Figure 6 shows a detailed inventory of the existing pedestrian infrastructure in the study area and Figure 7 shows the existing pedestrian volumes north of the site. Sidewalks, crosswalks, and curb ramps are evaluated based on the guidelines set forth by DDOT’s *Public Realm Design Manual (July, 2011)* in addition to ADA standards. Sidewalk widths and requirements for the District are shown below in Table 5.

Within the area shown, most roadways are considered residential with a low to moderate density. Most of the sidewalks surrounding the site comply with these standards;

Table 4: Sidewalk Requirements

Street Type	Minimum Sidewalk Width	Minimum Buffer Width
Residential (Low to Moderate Density)	6 ft	4 ft (6 ft preferred for tree space)
Residential (High Density)	8 ft	4 ft (6 ft preferred for tree space)
Commercial (Non-downtown)	10 ft	4 ft
Downtown	16 ft	6 ft

however there are some areas which have inadequate sidewalks or no sidewalks at all. Most notably, an informal dirt pedestrian path exists north of the site through the park

connecting Gallatin Street and Galloway Street and a providing more direct connection for residents in the neighborhoods south of the Fort Totten Metro Station. This path is not lighted, paved, or provides ADA connectivity.

ADA standards require that all curb ramps be provided wherever an accessible route crosses a curb and must have a detectable warning. Additionally, curb ramps shared between two crosswalks are not desired. As shown in the figure, under existing conditions, there are some issues with crosswalks and curb ramps near the site.

Proposed Pedestrian Facilities

In the vicinity of the site, a pedestrian connection is proposed from the site to 6th Street to the north, providing pedestrian connectivity for Totten Mews and other residents to the south with a more direct means of accessing Emerson Street, the Fort Totten Metro Station, and bus stops along South Dakota Avenue northeast of the site.

In addition, a formal pedestrian path through the park north of the site is planned by the National Park Service and DDOT in order to provide safer and more efficient connection than the existing informal dirt path that currently exists today.

SITE IMPACTS

This section summarizes the impacts of the development on the overall pedestrian operations surrounding the development.

Pedestrian Trip Generation

The Totten Mews development is expected to generate 2 walking trips during the morning peak hour and 2 walking trips during the afternoon peak hour. The origins and destinations of these trips are likely to be employment opportunities where residents can walk to work such as Providence Hospital to the southeast of the site or other nearby employers.

In addition to these trips, the transit trips generated by the site

will also generate pedestrian demand between the Totten Mews site and nearby transit stops. The majority of these transit riders will be walking to South Dakota Avenue to access

Metrobus Service or to the Fort Totten Metrorail Station. The pedestrian path to the Metrorail station from the development would have a pedestrian exiting the development, using the pedestrian path connection to 6th Street north of the site and using Emerson Street, 6th Place, Gallatin Street, South Dakota Avenue, and finally Galloway Street to access the Metro station.

Based on these origins/destinations, most pedestrian trips generated by the development will be traveling north of the site using the proposed pedestrian connection north to 6th Street and Emerson Street.

Pedestrian Recommendations

As noted on Figure 6, some deficiencies exist in the pedestrian network north of the site for pedestrians needing to access the Fort Totten Metro Station. Most notably are the lack of curb ramps and crosswalks at the Emerson Street/6th Place intersection and crosswalks at the Gallatin Street/6th Place intersection. It is recommended that these curb ramps and crosswalks be installed in conjunction with the development of the Totten Mews PUD.

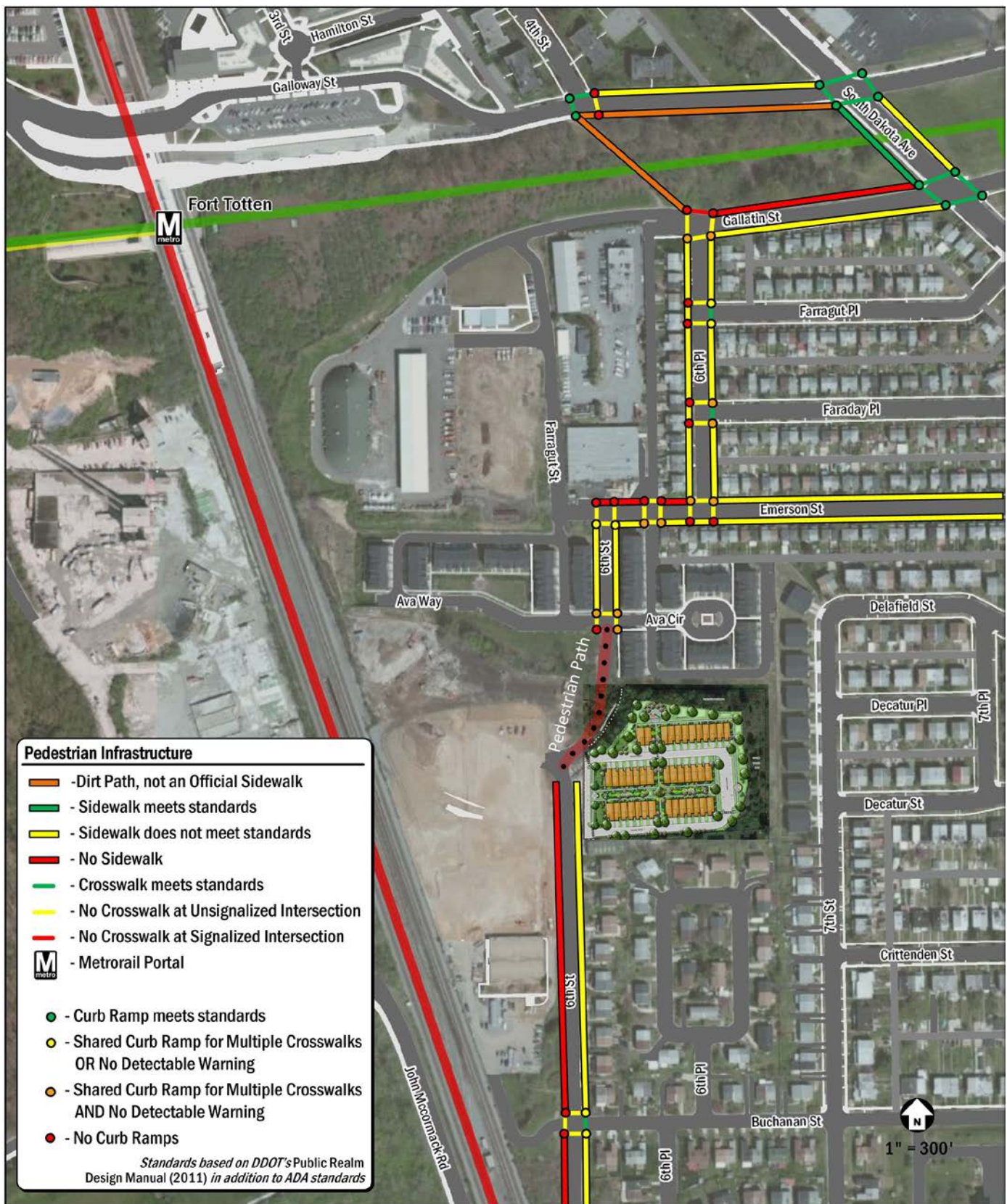


Figure 7: Existing Pedestrian Infrastructure



Figure 8: Existing Pedestrian Volumes

BICYCLE FACILITIES

This section summarizes existing and future bicycle access, reviews the quality of cycling routes to and from the site, and presents recommendations.

The following conclusions are reached within this chapter:

- There are multiple high-quality bicycle facilities within the vicinity of the site.
- New protected bicycle infrastructure will likely be implemented near the site in the coming years that will further improve the cycling conditions in the area.
- There are several bicycle-focused elements of the development plan that will encourage cycling as a safe and effective transportation option for residents and patrons of the development.
- Given the existing and proposed bicycle infrastructure in the study area, the site-generated bicycle trips will not result in detrimental impacts to the bicycle system.

EXISTING BICYCLE FACILITIES

The site does provide some connectivity to existing on- and off-street bicycle facilities. The low volume neighborhood streets surrounding the site provide safe bicycling conditions out of the neighborhood. However, some barriers exist to accessing the Metropolitan Branch Trail, which is located on the opposite side of the Metrorail tracks west of the site. Access to the Metropolitan Branch Trail is provided from Galloway Street, north of the Fort Totten Metro Station. The Metropolitan Branch Trail connects the site to the Union Station and downtown Washington DC to the south. Figure 13 illustrates existing and planned bicycle facilities in the area.

Given the existing use of the site, little bike traffic is currently observed and thus no bike parking is currently provided in the direct vicinity of the site. Cyclists that do bike to the existing site are observed using street signs or similar objects to secure their bicycles.

In addition to personal bicycles, the Capital Bikeshare program provides an additional cycling option for residents and patrons of the Totten Mews development. The Bikeshare program has placed over 300 bicycle-share stations across Washington, DC, Arlington and Alexandria, VA, and most recently Montgomery County, MD with over 2,500 bicycles provided. There is one station located at the Fort Totten Metro Station, supplying 19

docks. Figure 13 identifies existing station locations in the study area.

PROPOSED BICYCLE FACILITIES

The *moveDC* plan outlines several other bicycle improvements in the vicinity of the site. These improvements are broken up into four tiers that rank the priority for implementation. The four tiers are broken down as follows:

- *Tier 1*
Investments should be considered as part of DDOT's 6-year TIP and annual work program development, if they are not already included. Some projects may be able to move directly into construction, while others become high priorities for advancement through the Project Development Process.
- *Tier 2*
Investments within this tier are not high priorities in the early years of *moveDC* implementation. They could begin moving through the Project Development Process if there are compelling reasons for their advancement.
- *Tier 3*
Investments within this tier are not priorities for DDOT-led advancement in the early years of *moveDC*'s implementation. They could move forward earlier under circumstances such as real estate development initiatives and non-DDOT partnerships providing the opportunity for non-District-led completion of specific funding.
- *Tier 4*
Generally, investments within this tier are not priorities for DDOT-led advancement and are lower priority for project development in the early years of implementation.

While the Tier 1 improvements are those likely to be seen implemented in a timeframe relevant to the development of the Totten Mews PUD, other Tier 2 and 3 improvements are also planned in the vicinity of the site. Tier 1 improvements include upgrades to the Metropolitan Branch Trail and access to the trail in the vicinity of the site. Tier 2 improvements near the site include the installation of bicycle facilities along Taylor Street south of the site and 12th Street east and south of the site. Tier 3 improvements include the installation of bicycle facilities along South Dakota Avenue east of the site and Galloway Street north of the site. No significant Tier 4 bicycle improvement were noted near the site.



ON-SITE BICYCLE FACILITIES

While most residents are anticipated to utilize their individual townhomes for secure bicycle storage, bicycle racks will be placed in various places throughout the development.

SITE IMPACTS

The Totten Mews site is expected to generate 2 bicycle trips during the morning peak hour and 2 bicycle trips during the afternoon peak hour. The impacts from bicycling will be relatively less than impacts to other modes due to the low overall volumes of bicyclists. Overall, the development is not expected to have a negative impact on bicycle facilities in the area.

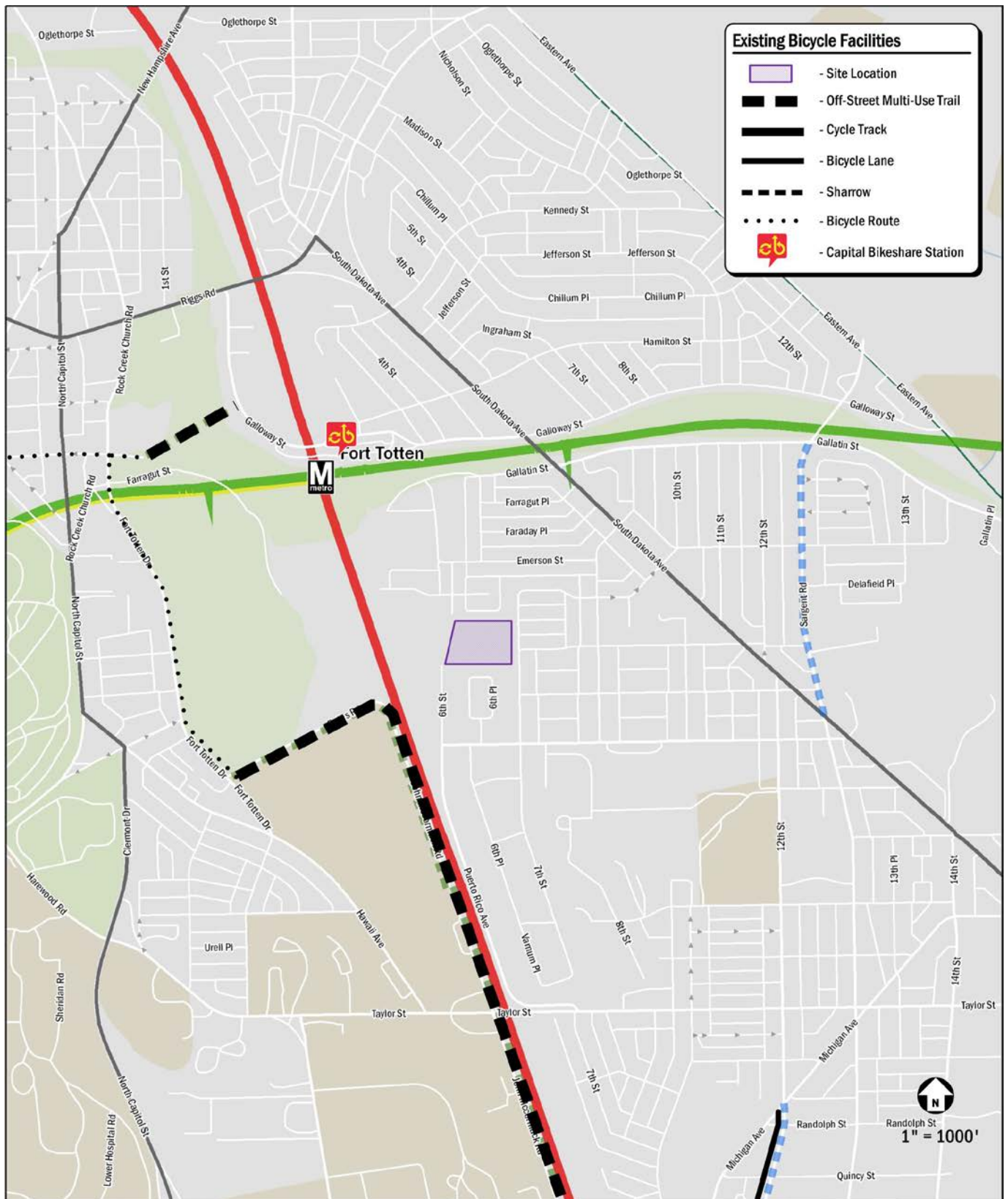


Figure 9: Existing Bicycle Facilities

SUMMARY AND CONCLUSIONS

The TIS for the proposed Totten Mews development, Zoning Case Number 15-04, reviewed the transportation aspects of the PUD application. This report concluded that **the PUD will not have a detrimental impact** to the surrounding transportation network, assuming completion of all background improvements and site improvements.

The purpose of this study is to evaluate whether the PUD will generate a detrimental impact to the surrounding transportation network. The vehicular evaluation is based on a technical comparison of the existing conditions and two future conditions: 2018 future background conditions without the PUD, and 2018 future conditions with the PUD. The transit, pedestrian, and bicycle evaluations are based on a review of the existing surrounding infrastructure to determine their ability to accommodate the impacts of the proposed development. This report concludes that the PUD will not have a detrimental impact to the surrounding transportation network.

Proposed PUD

The Totten Mews PUD proposes to develop a vacant lot at the terminus of a private driveway extending from 6th Street NE with 40 residential townhomes. At present, a largely vacant lot used partially for school bus parking occupies the Totten Mews site. The residential development will be accessed via two (2) proposed entrances both located along 6th Street NE, which is private adjacent to the site. A private internal loop road flanked with the 40 proposed townhomes will connect the south entrance with the north entrance.

Pedestrian access will also be from 6th Street. A pedestrian path connects 6th Street near the site north to Emerson Street so that residents have a link to the Fort Totten Metro station and bus stops along South Dakota Avenue. Each townhome will have a single vehicle garage for residential parking. Additional parking will be available along the internal access roadway and along the east side of the private 6th Street extension. Loading activities, trash pickup, and deliveries would occur curbside from the internal loop road within the development.

Parking

The PUD will provide one (1) garaged parking space for each of the 40 townhomes. These 40 garage parking spaces equate to a parking ratio of one (1) space per unit. This amount of parking

is typical for this type of new residential development in the District. In addition, the driveway of each townhome has been designed to accommodate an additional vehicle and 17 on-street parking spaces will be available along the internal access roadway and along the east side of the private 6th Street extension.

Loading Activities

As mentioned previously, loading activities, trash pickup, and deliveries would occur curbside from the internal private loop road within the development.

Vehicular Impacts

The report includes an analysis of potential vehicular impacts of the Totten Mews PUD and recommendations for improvements and mitigation measures. The following conclusions are reached:

- The existing study area residential roadways operate under acceptable capacity conditions during the morning and afternoon peak hour.
- No background developments will have an origin or destination within the study area. The modest inherent growth rate applied to the adjacent 6th Street intersection with Buchanan Street would add few trips to the local streets and have little to no impact on their operation.
- The PUD is anticipated to generate 15 AM peak hour vehicular trips (3 inbound and 12 outbound) and 16 PM peak hour vehicular trips (11 inbound and 5 outbound), all of which will be oriented to the south on 6th Street since no connection of 6th Street is planned to the north from the development. DDOT's threshold for study of vehicular impacts of a site notes that any site generating more than 25 peak hour, peak direction trips should be examined to note any additional impacts. Since the 12 AM peak hour peak direction and 11 PM peak hour peak direction trips calculated for this development do not meet this threshold, the impacts associated are expected to be negligible.
- While DDOT standards do not require the study of vehicular impacts to the site, a review of the impact of site trips through the intersection closest to the site was undertaken and found that impacts attributable to the PUD are negligible and have no significant effect on the surrounding roadway network. The few site trips passing through the study intersection would be dissipated into a maximum of a few trips per turning movement once reaching major roadways.



- The Totten Mews PUD will have no detrimental impacts to the study area.

Transit

The following summarizes the site's access to transit and the expected site impacts:

- The site is served by the Metrorail Red, Yellow, and Green Lines via the Fort Totten Station located approximately a half mile from the site, and four Metrobus routes that travel along South Dakota Avenue, Gallatin Street, and Taylor Street. The closest of these Metrobus routes to the site travels along South Dakota Avenue (Route 80), approximately four tenths of a mile from the site.
- The site is anticipated to generate 10 transit person trips in the AM peak hour and 11 transit person trips in the PM peak hour. All of these are anticipated to use the pedestrian walkway connecting the site north of 6th Street to the Fort Totten Metro Station and the closest bus stops along South Dakota Avenue.
- Transit-trips generated by the site will not have a detrimental impact on the surrounding transit system.

Pedestrian

Based on an analysis of the existing pedestrian conditions, a review of the background improvements, and planned site design elements, the following conclusions were made:

- Some deficiencies are present along the pedestrian paths from the site to the Fort Totten Metro Station and local bus stops. Mostly the sidewalks are narrow due to the low-density residential characteristics of the neighborhood. Additionally, some street sections only provide sidewalks on one side of the street, and some crossings lack crosswalks and/or curb ramps within the residential neighborhood. Most notably along the potential pedestrian route from the development to the Ft. Totten Metro Station, deficient and missing sidewalks were noted along Emerson Street and 6th Place and deficient and missing curb ramps were noted at the Emerson Street/6th Place and Gallatin Street/6th Place intersections.
- Despite the noted deficiencies, the pedestrian routes from the site are mostly located along low-volume, low-speed residential streets, and thus provide safe connections to local transit facilities.

- Pedestrians headed to the Fort Totten Metro Station from the site presently are intended to utilize South Dakota Avenue to walk north from Gallatin Street before heading west on Galloway Street. However, existing counts collected at 6th Place and Gallatin Street indicate that current residents are also utilizing a dirt path through the park north of the site to connect to Galloway Street.
- The site is anticipated to generate 2 pedestrian person trips in the AM peak hour and 2 pedestrian person trips in the PM peak hour. These trips are in addition to the 10 transit trips in the AM peak hour and the 11 transit trips in the PM peak hour that are anticipated to initially leave the site as pedestrian trips. All of these are anticipated to use the pedestrian walkway connecting the site north of 6th Street to the Fort Totten Metro Station and the closest bus stops along South Dakota Avenue.
- This report recommends the installation of new curb ramps and crosswalks at the Emerson Street/6th Place intersection and a crosswalk at the Gallatin Street/6th Place intersection.

Bicycle

The bicycle facilities within the study area were evaluated and the following conclusions were made in regards to the existing and proposed bicycle facilities and the overall impact of the site on bicycle infrastructure:

- Near the site, bicyclists would likely use the low-volume, low-speed residential streets as safe connectors to designated bike lanes and trails in the vicinity. While few bicycle facilities exist to the north and east of the site, the off-street trail that runs north-south parallel to John McCormack Road on the opposite side of the Metrorail from the PUD would provide residents a safe connection to Union Station to the south.
- New protected bicycle infrastructure will likely be implemented near the site in the coming years that will further improve the cycling conditions in the area. DDOT anticipates that these new infrastructure improvements will result in a five percent bicycle mode share for Totten Mews residents.
- Residents of the development will be able to securely store any personal bicycles within their garages or townhomes. In addition, bicycle parking racks are planned to be located throughout the development.
- Given the existing and proposed bicycle infrastructure in the study area, the site-generated bicycle trips will not result in detrimental impacts to the bicycle system.