3.0 Site Conditions

3.1 BRAC 133 Site Description and Land Use

Mark Center is a mixed-use business park located in Alexandria, Virginia at the southwest quadrant of the I-395 and Seminary Road interchange. The area currently includes 1.6 million square feet of office space, a Hilton hotel and conference center, numerous restaurants, two day care centers, and a shopping center. The site is located immediately adjacent to the 43-acre Winkler Botanical Preserve.

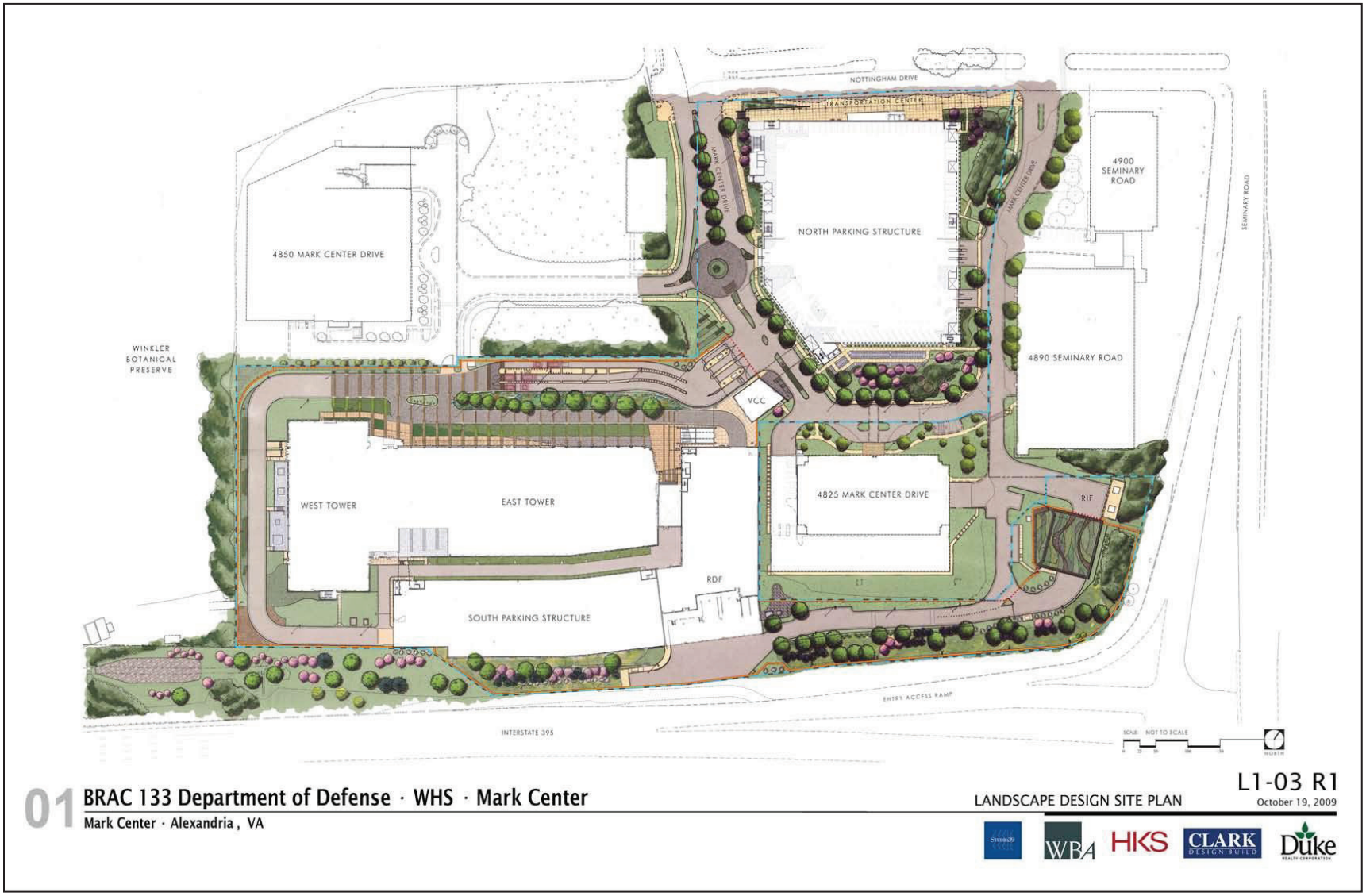
The BRAC 133 facility is a 16-acre site which was master-planned and approved in 2004 by the City of Alexandria[21]. The site plan shown in Figure 3-1 displays the 1.8 million square feet of office space in two BRAC 133 towers located on the southwest corner of the site. Parking structures are located to the south of the office buildings along I-395 (the South Parking Garage) and on the north side of the site (the North Parking Garage). The North Parking Garage will include a publicly-accessible community Transportation Center that will provide multiple transportation options for DoD employees as well as Mark Center commuters and visitors[22].

The office complex is being designed and constructed to achieve a LEED "Gold" rating[23], a national standard set by the U.S. Green Building Council to foster sustainable building design and construction. Cutting-edge strategies in environmentally sustainable construction and site development are being employed to ensure water savings, energy efficiency, and indoor environmental quality. When completed, the two towers will use 30 percent less energy and 45 percent less water than comparable office buildings. Figure 3-2 shows the scorecard for the building, demonstrating each of the elements that together aim for a LEED Gold rating.

The building will also contain a number of retail facilities and amenities for employees including a fitness center, a cafeteria, an office supply store, a snack/coffee shop, a health clinic, and a credit union. These on-site amenities will help to reduce mid-day trips.

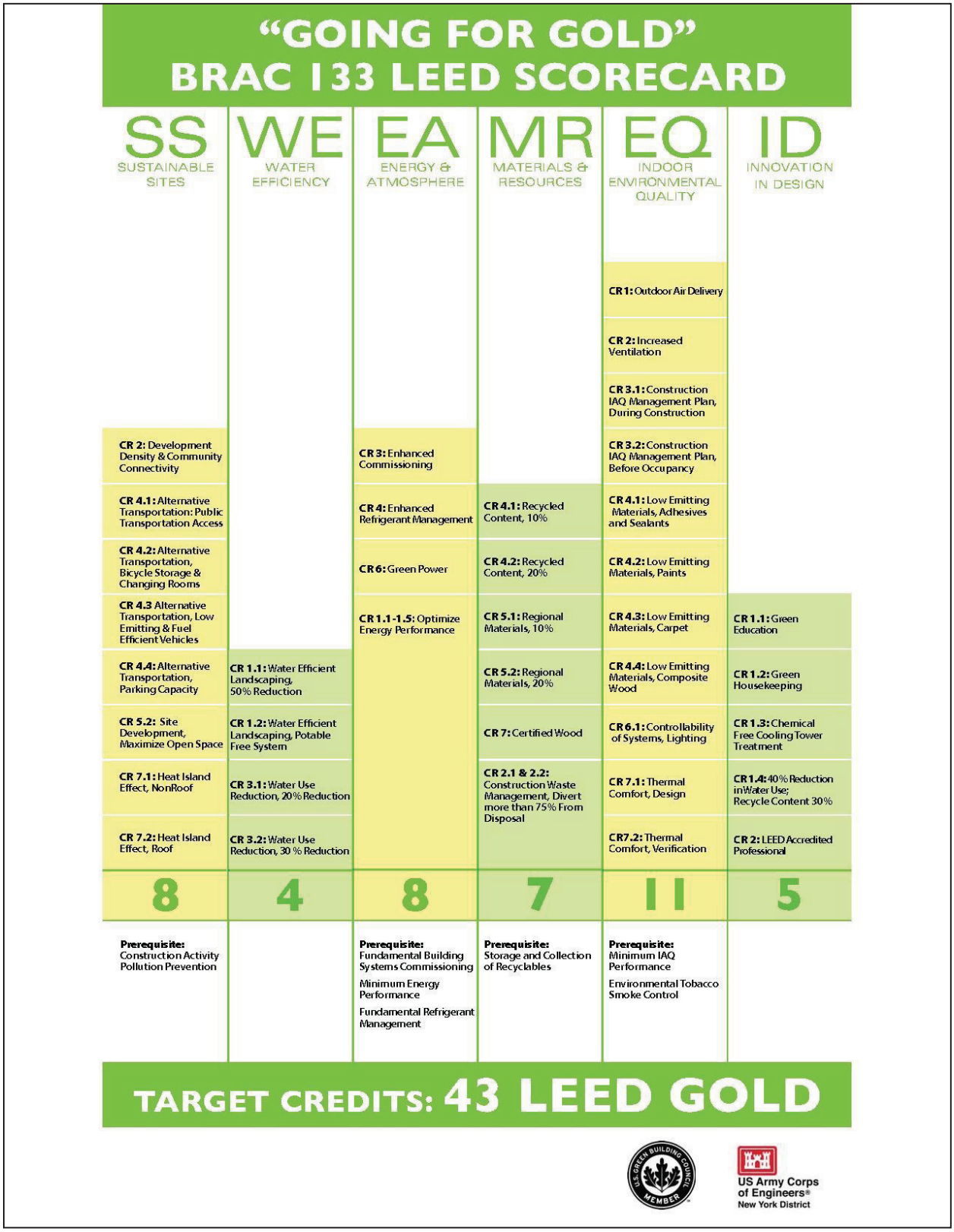
[21] Special Use Permit Certificate issued to the Mark Winkler Company, February 17, 2004.
[22] Belvoir New Vision - DoD BRAC 133 Project at Mark Center web page, http://www.belvoirnewvision.com/files/FINAL_BRAC133_Website_Collateral%5B1%5D.pdf (last accessed April 12, 2010).
[23] U.S Green Building Council "What LEED is" web page, http://www.usgbc.org/DisplayPage.aspx?CMSPageID=1988 (last accessed May 5, 2010).

Figure 3-1: Site Plan for the BRAC 133 Development



Source: USACE

Figure 3-2: LEED Scorecard for the BRAC 133 Development



Source: USACE

3.2 Site Access

3.2.1 Existing Roadway Access

The study area is served by an extensive roadway system that includes an interstate freeway, a principal arterial, and collector streets. The BRAC 133 site is bounded by I-395 to the east, Seminary Road to the north, North Beauregard Street and Mark Center Drive to the west, and the Winkler Botanical Preserve to the south. The existing site can be accessed via:

1. The intersection of North Beauregard Street and Mark Center Drive to the west of the site.
2. The intersection of Seminary Road and Mark Center Drive to the northwest of the site.

The existing site traffic from the I-395 northbound and southbound ramps accesses the site via the intersection of Seminary Road and Mark Center Drive and has inadequate weave lengths to make the necessary lane changes.

I-395/Henry G. Shirley Memorial Highway

I-395/Henry G. Shirley Memorial Highway is a north-south interstate freeway in the vicinity of the study area connecting Springfield and Washington DC. The interstate freeway is a six-lane GP facility with a barrier-separated two-lane HOV facility in the median. The freeway mainline section through the study area offers three GP lanes along the northbound and southbound movements, with a full southbound auxiliary lane between the adjacent interchanges of King Street and Duke Street. This auxiliary lane merges to the left just before the Duke Street interchange exit and entrance ramps. The GP lanes operate at 55 mph and the HOV lanes at 65 mph. The HOV lanes are reversible in nature serving the peak direction of travel during the morning and evening peak hours, and are restricted to motor vehicles with three or more occupants. The HOV lanes are open from 6:00 AM through 9:00 AM during the morning peak hours and 3:30 PM through 6:00 PM during the evening peak hours on weekdays. The HOV lanes are open to all during the off-peak periods except during the hours closed for lane reversals.

The I-395 interchange at Seminary Road is the primary access point for traffic traveling from the northern and southern regions to the Mark Center site. The interchange is a three-level, full-service interchange with Seminary Road at the third level, the Seminary Road ramp intersections in a rotary arrangement at the second level, and the I-395 mainline in the first level. The interstate also provides access to the City of Alexandria via the King Street and Duke Street interchanges to the north and south of the Seminary Road interchange. Both King and Duke Streets intersect with the North Beauregard Street corridor, approximately 0.75 and 2.0 miles north and south of Seminary Road, respectively. It should be noted that there is no direct HOV access from I-395 northbound to Seminary Road; however, a ramp does provide access from Seminary Road to the northbound I-395 HOV lanes during the morning peak period as well as access from the southbound I-395 HOV lanes to Seminary Road during the evening peak period. This HOV access will not benefit the BRAC 133 traffic accessing the Mark Center site from either the north or south directions. The closest I-395 HOV exits to access the Mark Center site in the morning peak hour are the Springfield exit south of the site and the Pentagon exit north of the site. Drivers exiting the HOV lanes at these locations will have to travel along the northbound and southbound I-395 GP lanes, respectively, to access the site. The HOV lane entry points for vehicles

exiting the Mark Center site in the evening peak hour are the Pentagon entrance to the north of the site and the Duke or Springfield entrances to the south of the site. Drivers entering the HOV lanes at these locations will have to exit the site and travel along the northbound and southbound I-395 GP lanes, respectively, to access the HOV lanes.

Seminary Road

Seminary Road is an east-west arterial that provides direct access to the site from I-395. The arterial intersects at-grade with Library Lane, Mark Center Drive, and North Beauregard Street, and is controlled by traffic signals. Seminary Road is a six-lane divided arterial between Library Lane and North Beauregard Street, except for the I-395overpass, which is a four-lane section. Seminary Road operates at a posted speed limit of 35 mph between Library Lane and North Beauregard Street. The arterial provides access to office complexes and developments along the corridor and offers exclusive turn lanes at intersections.

North Beauregard Street

North Beauregard Street is a north-south four-lane divided arterial operating at a posted speed limit of 35 mph. The intersection with Mark Center Drive is another primary access point to the site. This intersection will also serve as the only access to the site for vehicles approaching the site from the I-395 ramps. The corridor also provides access to developments along the corridor.

Mark Center Drive

Mark Center Drive is a two-lane loop road providing local access to the developments within Mark Center and connects with both Seminary Road and North Beauregard Street. Currently, IDA and Mark Center Express shuttle buses circulate Mark Center Drive to provide access to existing office complexes in the study area.

The existing Mark Center traffic exiting from the I-395 north and southbound movements at the Seminary Road interchange is prevented from accessing Mark Center Drive at the Seminary Road intersection by a white solid dividing stripe. Only the westbound Seminary Road traffic can legally execute left turns at the Mark Center Drive intersection. I-395 traffic accessing Mark Center is required to travel along Seminary Road and execute left turns at the Seminary Road and North Beauregard Street intersection and then access the site via the North Beauregard Street and Mark Center Drive intersection. This is required due to the limited weaving distance available between the exit ramp merge point at Seminary Road and the beginning of the left turn lane taper at Mark Center Drive. Although there is a solid white stripe prohibiting I-395 traffic from making a left at Mark Center Drive, most of the I-395 exit ramp traffic accessing Mark Center today violates the marking. Drivers weave over multiple lanes within a 100 foot distance in order to execute an illegal left turn. This weaving maneuver has resulted in multiple vehicular crashes and safety concerns.

3.2.2 Planned Roadway Access

Many adjacent roadway improvements are being implemented and are considered as part of BRAC 133 development mitigation measures to improve traffic operations along the adjacent roadway network and access points to the BRAC 133 facility. For this TMP development process, only the interim improvements that are currently under construction and scheduled for completion before September 15, 2011 have been considered as part of future roadway geometry.

The overall site-generated vehicular trips including the SOV, rideshare, and shuttle bus trips that will access the site via Mark Center Drive / Seminary Road and Mark Center Drive / North Beauregard Street intersections. It was noted that the projected traffic demand at these intersections under build-out conditions will require additional left turn lane capacity to maintain acceptable levels of service. In addition, the existing Nottingham Drive / Mark Center Drive (future Mark Center Drive / Mark Center Drive) will be improved to serve as a major internal roadway facilitating access and circulation within the site. This necessitated traffic control improvements along Mark Center Drive intersections. The 2003 *Mark Center Parcel 1A and 1B Traffic Impact Study (TIS) and Transportation Management Plan (TMP)*[24] identified these capacity and traffic control improvements as being necessary to maintain acceptable traffic operations under full build-out conditions.

In addition to the capacity and traffic control improvements identified in the 2003 Mark Center TIS, a fourth offsite roadway improvement was recommended to minimize traffic weaving from the I-395 exit ramps accessing Seminary Road and promote traffic safety along Seminary Road. The proposed offsite roadway improvement will include a physical barrier to prevent I-395 traffic from executing the short-distance weaving maneuver to turn left at the Mark Center Drive intersection.

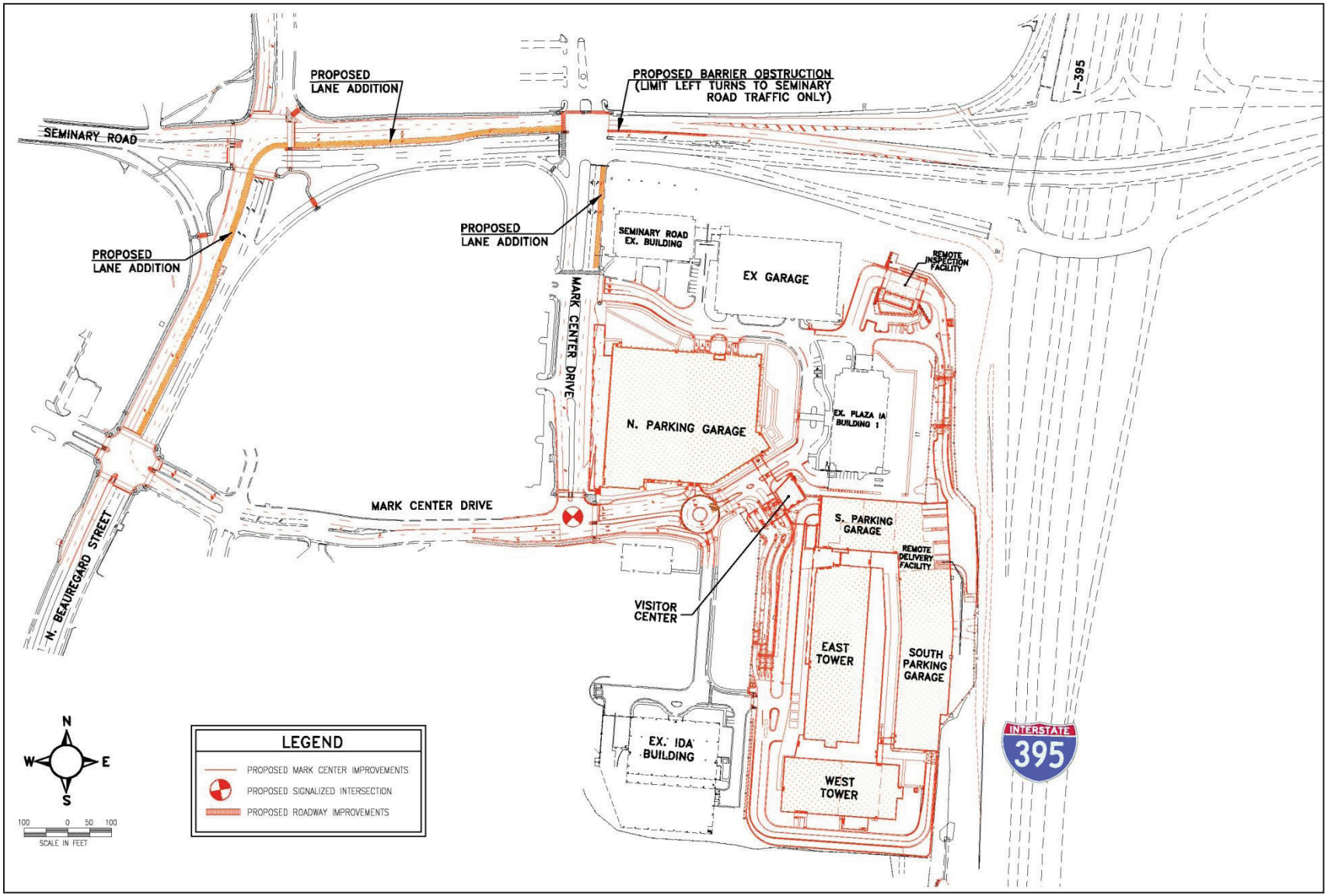
Interim (2011) roadway improvements that are currently under construction and scheduled for completion before September 15, 2011 include:

1. Construction of a third left turn lane from westbound Seminary Road to southbound North Beauregard Street.
2. Construction of a second southbound-to-eastbound left-turn lane at the North Beauregard Street and Mark Center Drive intersection.
3. Installation of a new traffic signal at the Mark Center Drive and IDA Driver on-site intersection.
4. Installation of a physical barrier to prevent I-395 ramp traffic from accessing Mark center via the intersection of Seminary Road and Mark Center Drive. Traffic approaching the site from Seminary Road or from Southern Towers will still be able to access the site from this location.

Figure 3-3 highlights the proposed internal and external roadway improvements that will be in-place to serve the opening day traffic demand.

[24] *Mark Center Parcel 1A and 1B Traffic Impact Study and Transportation Management Plan*, Wells & Associates, March 31, 2003.

Figure 3-3: BRAC 133 Internal and External Roadway Improvements



Source: "Overall Site with Improvements" AutoCAD Drawing, USACE, March 01, 201

Besides these short-term improvements, other additional short-term and long-term improvements including roadway widening and traffic control improvements, and a direct HOV access ramp from I-395 South to Seminary Road[25] are currently being considered and evaluated[26].

Various access ramp alternatives serving the BRAC 133 site directly from I-395 South were considered and evaluated by VDOT. Two alternatives have been narrowed down for further study and are being evaluated for operations, access, and other impacts. VDOT, the City of Alexandria, and DoD are currently pursuing options to analyze the feasibility of these alternatives and to identify potential funding sources.

These long-term improvements would enhance the traffic flow and operations of this site as well as the regional traffic, but it should be noted that it will take many years to fund, design, and construct any such improvements.

3.2.3 Internal Site Access

The existing Mark Center Drive that runs in an east-west direction will be widened to four lanes and will serve as a loop road providing access to both the North and South Parking Garages, the visitor parking area, and the IDA buildings. A two-lane roundabout is proposed at the intersection of WHS Circle/IDA Drive and the North Parking Garage to slow down internal traffic and circulate them efficiently without stopping the through movements. A three-legged "T-intersection" is proposed at the South Parking Garage access from WHS Circle[27].

The BRAC 133 developments can be divided into the North Campus, South Campus and the Remote Inspection Facility (RIF)[28]. The North Campus includes the North Parking Garage and the Transportation Center. The South Campus is the largest area of the site and includes the South Parking Garage, the east and west towers, the Visitor Center, and the Remote Delivery Facility (RDF). The main access control point to the site is located at the South Campus. The North Parking garage has two access points, one via the WHS Circle and one via the internal loop road. The access point along the internal loop road has two inbound lanes and one outbound lane. The access point along WHS Circle offers one inbound lane and one outbound lane. The visitor parking area is located within the North Parking Garage but has a separate entrance from the general parking area. The visitor parking area has one inbound lane and one outbound lane.

The South Parking Garage has one inbound lane and one outbound lane along with one reversible lane to meet morning peak hour entry and evening peak hour exit demand. A proposed pedestrian bridge will connect the North Campus to the South Campus which accommodates the access control point to the site allowing employees and visitors to enter from the same location. Access to the WHS towers is

[25] Virginia Department of Transportation Mega Projects web page, http://www.vamegaprojects.com/faqsdocuments/mark-center-documents/ (last accessed April 5, 2010).
[26] City of Alexandria, "Planning & Zoning: Base Realignment & Closure (BRAC-133)" web page, http://alexandriava.gov/BRAC (last accessed May 5, 2010).
[27] *WHS Internal Roadway Network Traffic Analysis*, Wells and Associates, August 20, 2009.
[28] Fort Belvoir BRAC 133 Project, Mark Center Development, Department of Army Staff Recommendation to NCPC, December 30, 2009.

secured through guarded access control points with employee identity verification booths at the South Campus. The location of the main access control point at the South Campus prevents the possibility of spillback from traffic queues waiting at the access control gates. This will prevent traffic queues from affecting the adjacent major roadway network operations.

The visitor traffic entering the site will be strictly controlled and managed by the PFPA PMB. Every visitor will be required to register in advance and receive approval from PFPA, at least 1 day prior to visiting the site. When arriving at the site, the visitor's credentials will be verified by the PFPA before they are permitted to enter the visitor parking area. This advance verification process will minimize the traffic queues at the visitor parking entry point, promote regulation of arrival times of visitor vehicles and limit the number of daily visitors entering the site.

The RDF will be located adjacent to the South Parking Garage. All trucks accessing the RDF will first be screened at the RIF. The RIF will be located in a secure area along the northeast corner of the site adjacent to the existing Center for Naval Analyses (CNA) building and the parking garage at 4890 Seminary Road. Trucks accessing the RIF will circulate around the North Parking Garage via an access road paralleling I-395 and enter the facility for vehicle inspection. Any vehicles that fail the scan will be forced to exit the site. The RIF will be located partially below grade and will incorporate screening along Seminary Road and green roofing to blend in with the surrounding landscape and to minimize visibility from adjacent roadways. The site is expected to receive approximately 35 deliveries each weekday.

3.2.4 Pedestrian Access & Facilities

Existing site conditions indicate a continuous walkway system along Seminary Road, North Beauregard Street and Mark Center Drive providing access to Southern Towers and existing Mark Center buildings. Sidewalks exist along both sides of Seminary Road between the North Beauregard Street and Mark Center Drive intersections, and along both sides of North Beauregard Street from the Sanger to Seminary Road intersections, with Americans with Disabilities Act (ADA)-standard ramps and high visibility markings at pedestrian crossing locations. Marked pedestrian crosswalks exist only along the north and west crossing legs of the Seminary Road and Mark Center Drive intersection forcing pedestrians to cross only at these locations. Pedestrian signal heads with push buttons exist along some pedestrian signal crossing locations.

However, the existing pedestrian walkway system adjacent to the Mark Center site is in poor condition with substandard effective sidewalk widths (4 feet or less) and pavement conditions, discouraging pedestrian mode of travel and posing a threat to pedestrian safety, especially to the disabled pedestrians. The signage for pedestrian travel is also inconsistent through the region. The existing Seminary Road and North Beauregard Street intersection does not offer pedestrian signal heads at crossing locations making it unsafe for the pedestrians crossing this heavily traveled intersection. Discontinuous sidewalks exist along the east side of North Beauregard Street between Mark Center Drive and Seminary Road intersections. The existing pedestrian push buttons at the signalized crossing locations do not meet the ADA standards[29].

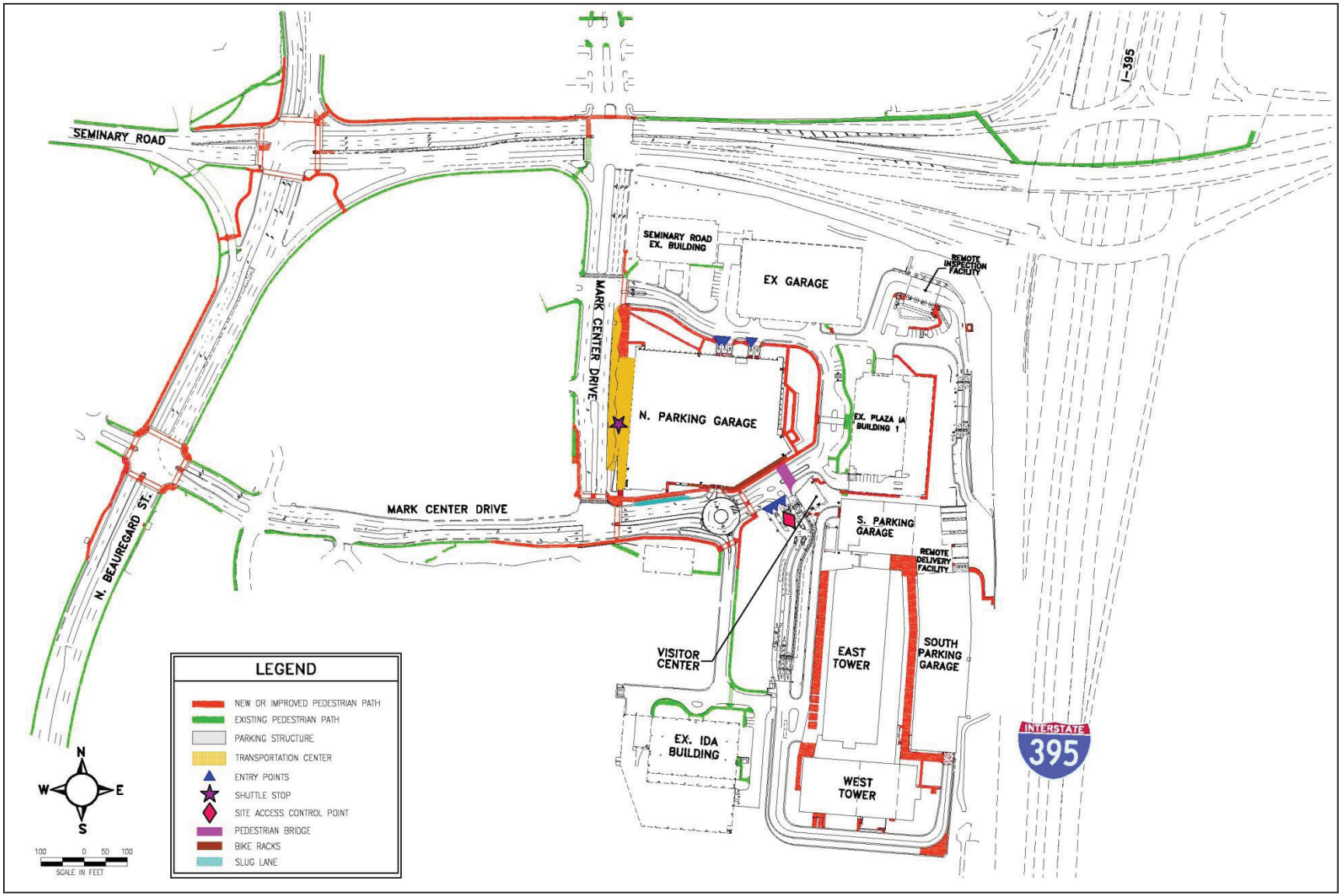
[29] *Seminary Road/Beauregard Street Corridor(s) Traffic Study*, Wilbur Smith Associates, January 19, 2007.

The proposed sidewalk and crosswalk plan as part of the BRAC 133 development promotes connectivity by integrating the existing sidewalks and pathways to the boundary roadways that provide access to the BRAC 133 facility and the internal circulating system. The proposed plan includes improvement of the existing walkways and addition of new sidewalks throughout the site to promote continuity. The proposed improvements includes wider sidewalks and crosswalks (6 feet or more) throughout the study area, highly visible pavement markings, pedestrian refuge areas closer to high pedestrian traffic generators and activity centers, lateral separation between traffic and pedestrians, planting and landscape, and lighting. All intersection crosswalks will meet the accessibility guidelines set by the Americans with Disabilities Act (ADA) by including gentle grades and cross slopes and ADA ramps at crossing locations. These improvements will promote safe and enjoyable pedestrian travel throughout the study area. The proposed plan will also allow pedestrian crossing opportunities at all major intersections by providing optimized signal timing for pedestrian crossings, thus minimizing any potential conflict with vehicular traffic. Figure 3-4 shows the pedestrian circulation plan highlighting the existing and proposed or improved walkways along with the major pedestrian activity centers.

No pedestrian movement will be allowed at the ground level area between the North and South Parking Garages to prevent any potential conflict with vehicular traffic. Shuttle buses, the Transportation Center, and slug lines will be connected to primary pedestrian paths to provide convenient access to BRAC 133 commuters. A pedestrian bridge will connect the North Campus to the South Campus. Visitors entering the site from the North Parking garage will be able to access the Visitor Control Center (VCC) located in the main building using the pedestrian bridge. The access control point to the site is located at the South Campus. Employees and visitors can access the towers from this location after being verified.

Crosswalks and pedestrian signal timing allocation for pedestrians crossing at the Seminary Road and Mark Center Drive intersection will be provided only along the north side of Mark Center Drive and the west side of Seminary Road to maximize intersection operations by providing adequate green time for the critical intersection movements. The signal timing at the Seminary Road and North Beauregard Street intersection will need to be modified to allow pedestrian crossing along the westbound Seminary Road and southbound North Beauregard Street approaches of the intersection. Secondary paths throughout the site will be enhanced by providing landscaping and lighting to provide an attractive, amenable, and comfortable environment for visitors and employees.

Figure 3-4: Proposed Pedestrian Circulation Plan and Major Activity Centers



Source: "Overall Site with Improvements" AutoCAD Drawing, USACE, March 01, 2010

3.2.5 Access Control Facilities

The proposed access control security features at the BRAC 133 site are in compliance with the Army required Access Control Point (ACP) standards[30]. The South Campus will serve as the main ACP to the site. The visitors and employees from the North Parking Garage will access the South Campus via the pedestrian bridge for verification and identification before entering the facility. The ACP at the Campus implements the vehicle presence detection safety method for entry control.

The proposed access control includes Active Vehicle Barrier (AVB) and Passive Vehicle Barrier (PVB) systems that work sequentially to provide security to the site and the ACP users. The entry vehicles will be checked and authorized by the guards at the entry guard booth. Authorized vehicles will be guided through the PVB consisting of chicanes and traffic bollards to arrive at a stop and go signal control at the AVB location. Any unauthorized vehicles identified at the guard booth will be forced to a turn-around path adjacent to the guard booth.

The ACP at the South Parking Garage includes two inbound ID lanes with guard booths and a third ID lane reserved for overflow capacity. Under normal processing conditions, each proposed ID check point will process 350 vehicles per hour, a maximum of 700 vehicles during the highest peak hour demand. Two inbound lanes proceeding from the ID check points will also process vehicles at the rate of 350 vehicles per hour per lane, serving a maximum of 700 vehicles during the highest peak hour demand[31]. The projected trips generated by the site indicate an hourly demand of only 550 vehicles entering the South Parking Garage during the highest peak hour. This allows adequate gaps between entering vehicles at the ACP and prevents any possible queue build-up. The two lanes proceeding from the AVBs merge to a single lane before entering the South Parking Garage. The third reserved ID lane can be used for all vehicles, based on demand. Detailed discussion on the projected trips, future traffic operations and traffic queues are included in Section 4.

3.3 Transit

3.3.1 Existing Bus Transit Service

The Mark Center area is currently served by a number of public bus routes provided by the Alexandria Transit Company (DASH) and the Washington Metropolitan Area Transit Authority (WMATA), as well as one private bus route provided by Quick's Bus Company. Public bus stops are located at the Southern Towers apartment complex, one quarter mile away from the BRAC 133 site, and on Mark Center Drive just across from the proposed Transportation Center. While Mark Center is not served by a Metrorail station, most of the bus routes serving the area lead to a Metrorail destination, in addition to other major destinations.

[30] *WHS Internal Roadway Network Traffic Analysis*, Wells and Associates, August 20, 2009.
[31] Main Vehicle Access Control Point (ACP) Active Vehicle Barrier (AVB) Traffic Issue Memorandum, Department of the Army, August 26, 2009.

DASH Service

Alexandria Transit Company currently operates two DASH bus routes that serve Southern Towers apartment complex and Mark Center along North Beauregard Street approaching Mark Center Drive. These routes provide access to and from four Metrorail stations, including Eisenhower Avenue, Braddock Road, Van Dorn Street, and King Street Metrorail stations. Route maps for DASH routes AT1 and AT2 are provided in Appendix C.

The AT1 route provides service to the Eisenhower Avenue and Van Dorn Metrorail stations. This route operates seven runs to and from Mark Center during the 6:00 AM to 9:00 AM peak period and seven runs to and from Mark Center during the 3:00 PM to 6:00 PM peak period. This line operates from 5:09 AM to 11:11 PM on weekdays and operates a total of 32 runs to and from Mark Center during operating hours. The AT1 operates on 25 to 30 minute headways during peak periods.

The AT2 route provides service to the King Street and Braddock Road Metrorail stations. This route operates nine runs to and from Mark Center during the 6:00 AM to 9:00 AM peak period and seven runs to and from Mark Center during the 3:00 PM to 6:00 PM peak period. This line operates from 5:40 AM to 11:26 PM on weekdays and operates a total of 35 runs to and from Mark Center during operating hours. The AT2 operates on headways ranging from 17 to 30 minute headways during peak periods.

Metrobus Service

WMATA currently operates 10 bus routes that serve the Southern Towers apartment complex and Mark Center at along North Beauregard Street approaching Mark Center Drive and along Mark Center Drive approaching Seminary Road. The various WMATA routes provide access to and from five Metrorail stations, including the Pentagon, Ballston, Van Dorn Street, West Falls Church, and King Street Metrorail stations. Route maps for Metrobus routes 7, 25B, 28A, and 28G are provided in Appendix C.

Route 7 (Lincolnia-North Fairlington Line) operates frequent service through Mark Center via routes A,F,W, and X as well as Southern Towers via routes A,B,D,E,F, W, and X. The 7 route operates 46 runs through Mark Center and Southern Towers during the 6:00 AM to 9:00 AM peak period and 9 runs during the 3:00 PM to 6:00 PM peak period in the northbound direction, as well as 10 runs during the 6:00 AM to 9:00 AM peak period and 29 runs during the 3:00 PM to 6:00 PM peak period in the southbound direction. This line operates from 5:05 AM to 3:54 AM during weekdays and conducts 172 runs through the area during operating hours.

Route 25B (Landmark-Ballston Line) also operates service in close proximity to BRAC 133 via Southern Towers. During the 6:00 AM to 9:00 AM peak period, Route 25B operates six runs though Southern Towers and six runs during the 3:00 PM to 6:00 PM peak period in the northbound direction, as well as six runs during the 6:00 AM to 9:00 AM peak period and six runs during the 3:00 PM to 6:00 PM peak period in the southbound direction. This line operates from 6:04 AM to 10:07 PM and conducts 45 runs through Southern Towers during operating hours.

Route 28A (Alexandria-Tysons Corner Line) operates service to in close proximity to BRAC 133 via Southern Towers, with six runs operating during the 6:00 AM to 9:00 AM peak period and six runs during the 3:00 PM to 6:00 PM peak period in the eastbound direction, as well as six runs during the 6:00 AM

to 9:00 AM peak period and six runs during the 3:00 PM to 6:00 PM peak period in the westbound direction. This line operates from 5:30 AM to 12:59 AM and conducts 72 runs through Southern Towers during operating hours.

Route 28G (Skyline City Line) operates limited service to Southern Towers, with eight runs operating during the 6:00 AM to 9:00 AM peak period in the northbound direction, as well as eight runs during the 3:00 PM to 6:00 PM peak period in the southbound direction. This line operates from 5:50 AM to 7:18 PM and conducts 18 runs through Southern Towers during operating hours.

Figure 3-5 illustrates existing public transit service within one-half mile of the BRAC 133 site. A summary of operating routes and services is provided in Table 3-1 and these routes and services are discussed in more detail below. The routes summarized in Table 3-1 are routes that stop within walking distance (less than one-half mile) from the BRAC 133 site.

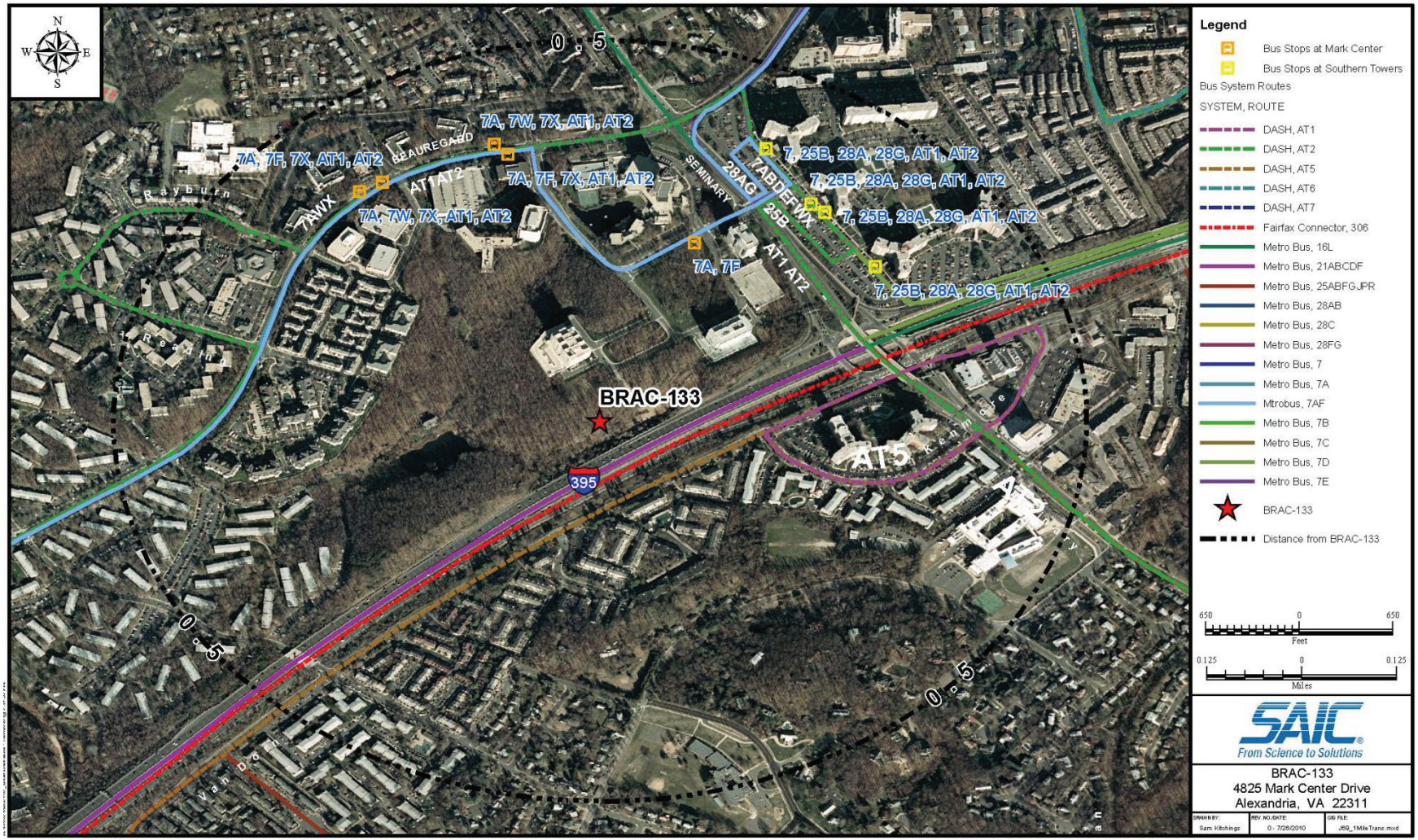
Quick's Bus Service

Quick's Bus Company is a private company operating commuter bus service from Fredericksburg, Virginia. The company currently operates one bus route that provides direct service to Mark Center from Fredericksburg and Stafford. The route conveniently serves Mark Center with stops at two buildings immediately adjacent to BRAC 133 (buildings 4900 and 4850). Quick's Bus Run #9 operates only once during the AM and PM peak periods, arriving at Mark Center at 6:00 AM, and leaving Mark Center at 3:20 PM. It is important to note that Quick's Bus, like many other private commuter bus companies, is equipped to accept federal transit vouchers through the DoD NCR Mass Transit Benefit Program (MTBP).

Public Feeder Service to Metrorail and VRE Stations

Given that the building population is distributed throughout the region and that the DoD will be establishing extensive shuttle service between BRAC 133 and key Metrorail and VRE stations, public bus transit service bringing commuters from the closest home bus stop to rail transit stations (otherwise known as public feeder service) will be critical to serve as the first leg of commuter trips. There are currently public feeder service options in place from nearly every jurisdiction around the region. Appendix C provides information on available public feeder services throughout the region that serve Metrorail and VRE stations.

Figure 3-5: Existing Bus Routes within One-Half Mile of BRAC-133 Facility



Bus Systems and Routes within 1/2 Mile of BRAC-133 Facility

Sources: ESRI, WMATA, DASH, Fairfax County Department of Transportation

Table 3-1: Transit Routes Serving Mark Center within One-Half Mile of the BRAC 133 Site

Route #	Origin	Destination	Direction	Stop Near BRAC 133	Number of Weekday Trips			Weekday Headways		
					AM Peak	PM Peak	Off-Peak	AM Peak	PM Peak	Off-Peak
Dash - Alexandria Transit Company										
AT1	Eisenhower/Van Dorn Metro	Seminary Plaza	NB	Mark Center Southern Towers	7	7	18	25	25	30
	Seminary Plaza	Eisenhower/Van Dorn Metro	SB	Mark Center Southern Towers	7	7	18	30	30	30
AT2	Lincolnia	Braddock Metro	EB	Mark Center Southern Towers	9	7	19	17	30	30
	Braddock Metro	Lincolnia	WB	Mark Center Southern Towers	7	9	19	30	20	30
Metrobus - WMATA										
7 A,B,D,E,F,W,X	Lincolnia	Pentagon	NB	Mark Center (7A,F,W,X only) Southern Towers (7A,B,D,E,F,W,X)	46	9	28	30	30	30
	Pentagon	Lincolnia	SB	Mark Center (7A,F,W,X only) Southern Towers (7A,B,D,E,F,W,X)	10	29	50	30	10	30
25B	Van Dorn Metro	Ballston Metro	NB	Southern Towers	6	6	11	30	30	60
	Ballston Metro	Van Dorn Metro	SB	Southern Towers	6	6	10	30	30	60
28A	Tysons Corner Center	King Street Metro	EB	Southern Towers	6	6	26	30	30	30
	King Street Metro	Tysons Corner Center	WB	Southern Towers	6	6	22	30	30	30
28G	Skyline City	Pentagon	NB	Southern Towers	8	0	0	25	---	---
	Pentagon	Skyline City	SB	Southern Towers	0	8	2	---	20	25
Private - Quick's Bus Company										
Run #9	Fredericksburg	Mark Center	NB	Mark Center (Bldgs 4850 & 4900)	1	0	0	---	---	---
	Mark Center	Fredericksburg	SB	Mark Center (Bldgs 4850 & 4900)	0	1	0	---	---	---

Source: WMATA, DASH, Quick's Bus
NOTE: AM Peak = 6:00 AM - 9:00 PM; PM Peak = 3:00 PM - 6:00 PM

3.3.2 Need for Modifications of Transit Routes

As part of the TMP process, the Army has engaged in discussions with transit service providers in the region to determine if any providers with cross-jurisdictional service capabilities (i.e., PRTC/Omniride, Loudoun County Transit, and WMATA) are considering establishing new service or adjusting existing routes to serve the needs of the employees who will be relocated to BRAC 133. The Army also engaged in multiple discussions with WMATA and DASH to determine if any of the routes that currently stop near the BRAC 133 site could be modified to include a stop at the Mark Center Transportation Center. Discussions were also held with local transit providers (i.e., Arlington Transit, DASH, Fairfax Connector) to determine if there are any planned modifications to public feeder routes that service VRE and/or Metrorail stations, as public feeder service will be critical to serving the BRAC 133 population.

On March 10, 2010, the Army conducted a BRAC 133 Transit Round Table Discussion with public transit providers from across Northern Virginia, including WMATA, DASH, Fairfax Connector, ART, PRTC/Omniride, and Loudoun County Transit. The purpose of the discussion was to provide these agencies with information about the population of individuals who will be moving to BRAC 133 and to have a constructive discussion about potential service modifications that would best serve this population. During this meeting the Army presented information about where BRAC 133 trips will originate based on employee home zip codes, as well as information about the current and expected mode share of this population by jurisdiction. Transit agencies across the region have generally expressed an interest in expanding service to meet the new travel patterns and needs of BRAC 133 employees, and are exploring solutions to implement modifications to transit routes. WMATA staff and transit staff from the City of Alexandria have identified a number of possible transit improvements that could be implemented to serve the BRAC 133 population; however, final decisions on moving forward with solutions have not been made to date. The most promising possibilities include those shown in Table 3-2.

Table 3-2: Possible Transit Improvements to serve the BRAC 133 Population

Description of Transit Improvement	Details of Transit Improvement
Establishing Bus Service from the King Street Metrorail Station to BRAC 133	Making adjustments to routes that currently serve nearby areas such as Southern Towers as well as the King Street Metrorail Station to directly serve BRAC 133. These include DASH's AT2 bus route and WMATA's 28A route.
	Making adjustments to routes that currently serve Southern Towers to directly serve BRAC 133. These include WMATA's routes 7BDE, 25AD (which serve the Northern Virginia Community College), WMATA's routes 25B, 28B, and 28F (which serve the Pentagon and Skyline City), and DASH's AT1 route.
	Increasing the frequency of DASH's AT2 route and adding a few runs each peak with limited-stop service from the King Street Metro station that coordinate with VRE arrivals at King Street.
Improving Existing Bus Service serving the Ballston Metrorail Station and add a stop at BRAC 133	Increasing the frequency of WMATA's 25B route which serves the Ballston Metrorail Station and adding a few runs each peak with limited-stop service with consideration of modifying the route using Van Dorn Street and Kenmore Avenue to access Seminary Road.
Establishing Bus Service between BRAC 133 and the Pentagon	Putting WMATA buses into service that are currently deadheading between the Pentagon and Mark Center on the 7 route.

Sources: Presentation given by Wendy Jia, WMATA, at BRAC Coordinators Meeting on February 18, 2010; Discussions with WMATA staff on March 3,2010; memo received from the City of Alexandria on May 3, 2010; WMATA Draft Report dated June 2010, "Transit Service Impacts of the Base Realignment and Closure Recommendations in the Metropolitan Washington Region."

WHS and the Army have engaged in discussions with WMATA and DASH to identify any potential modifications in bus stop locations, frequency, or routing that may be feasible in the future. Details are not finalized at this time but WHS will be continuing discussions with DASH and WMATA concerning possible route enhancements to support BRAC 133. In addition to this, DoD is evaluating the potential for local and regional service providers to provide part or all of the DoD Mark Center shuttle service. Decisions about service providers will be based on efficiency and cost effectiveness.

Another possibility for a mid-term modification is for private bus companies to establish direct service to Mark Center from areas to the south (e.g., Lorton/Quantico, Woodbridge, Fredericksburg, etc.). In March 2010, USACE and WHS met with two private commuter bus companies, Martz and Quick's Bus, to explore whether either would be interested in establishing direct commuter service to Mark Center. Although both companies saw the potential for significant ridership on this type of route, neither indicated definitive plans to establish new service, at least in the short term. However, both indicated that service in the future is a distinct possibility, particularly if either sees a decline in the number of riders to the Crystal City area, an area where many BRAC 133 employees currently work and a key market that both companies serve today.

These companies, and possibly others, will likely be assessing their routes in the months following the move, to determine if establishing new service is feasible. To facilitate this decision-making, within 6 months following the move, WHS will arrange a meeting with any private bus companies who have interest in providing bus service directly to Mark Center. The purpose of the meeting will be to share information about what is known about employee commute patterns at that point in time. The private bus companies may also elect to conduct an on-board survey of their existing riders to gauge interest in service to Mark Center.

3.3.3 Transportation Center

As shown in Figure 3-6, the BRAC 133 site will include a publicly-accessible Transportation Center attached to the North Parking Garage. The Transportation Center is located on Mark Center Drive west of Seminary Road. It includes five bus bays that will be available for shared-use by any public or private transit providers who are interested in providing service to the Mark Center. Any public or private agencies interested in providing service to the Transportation Center may do so by coordinating with WHS. Additionally there are two bus stops located on the west side of Mark Center Drive, directly across from the Transportation Center. These stops will remain in place and available for use through coordination with the City of Alexandria.

Figure 3-6: Mark Center Transportation Center

Source: USACE.

The Transportation Center has been designed as an open-air facility with overhead protection to shield travelers from the elements. It will include a restroom for use by bus operators and benches for public use. It will also include an area for agencies to post transit schedules and route information as well as overhead electronic signage to announce bus arrivals.

3.4 Slug Lines and Taxis

Slugging is a phenomenon that has been prominent in the DC region since HOV lanes were introduced on the Shirley Highway (I-395) in the 1970s. Initially the lanes were restricted to vehicles with four or more occupants, making it extremely difficult for commuters to establish reliable carpools. This led to the creation of what is commonly called "casual carpooling", whereby individuals looking to take advantage of the uncongested HOV lanes meet at designated pick-up locations to share a ride. Slugging is an informal, unofficial, local custom which is not sponsored by the U.S. Government. Although the HOV designation has since been lowered to require only three passengers per vehicle, the slugging phenomenon has remained strong.

Slugging plays a particularly critical role in transportation at the Pentagon given the large number of people who work at the Pentagon and the fact that the Pentagon itself is a major transit hub. Although currently there is no direct access (on or off) of the HOV lanes at Seminary Road in peak-hour directions, it is still expected that many BRAC 133 employees will make slugging part of their regular commute. This can be accomplished in a number of ways. For example, employees who have a parking space may choose to save time by picking up slugs at one of the well-established pick-up locations throughout the southern suburbs (see Appendix D) and driving them to the Pentagon before turning around and returning to the site via the I-395 southbound GP lanes. These same drivers may then elect to pick up "slugs" at Mark Center on their way home from work to save time (although the southbound HOV lanes cannot be accessed directly from Seminary Road, commuters can access the HOV lanes via a slip ramp

located approximately 2.5 miles south of Seminary Road). As for slugs, they may elect to slug to the Pentagon in the morning where they can ride the DoD shuttle to Mark Center. In the evenings they may elect to do the reverse or they may instead slug with a driver leaving directly from Mark Center. Anecdotal evidence suggests that for long-distance commuters (from Fairfax County and areas south), HOV access to the Mark Center via the Pentagon provides significantly better travel time as compared to using the GP lanes for the entire trip.

To accommodate to the local custom, the BRAC 133 site includes a designated location for slug lines. The designated slug area is located along Mark Center Drive just to the west of the North Parking Garage. The area will include signage instructing slugs and drivers about appropriate places to queue safely. As usage of the slug area is difficult to predict at this time and will likely change over time, WHS will observe operations over time in and around the slug area, and may choose in the future to move the slug area to a different location. During mid-day hours the slug area will be available for taxis.

3.5 Shuttle Services

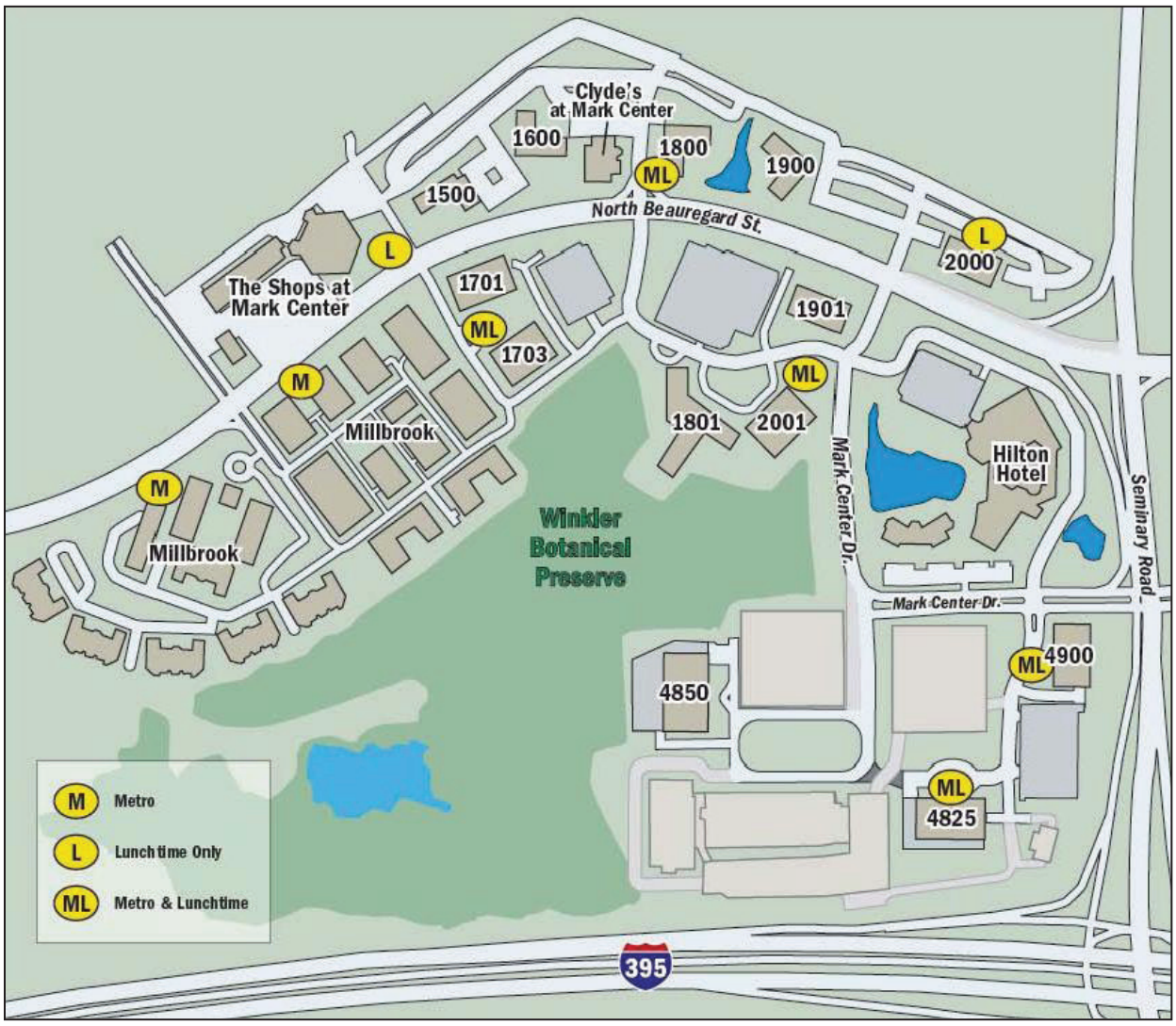
3.5.1 Local Mark Center Express Shuttle

The Duke Realty Corporation and Mark Center tenants CNA and IDA provide private shuttle service to Mark Center tenants, employees, and residents. Duke Realty Corporation provides the free weekday Mark Center Express shuttle service for Mark Center tenants to and from the Pentagon City Metrorail station, as well as within Mark Center. Tenants must display a Mark Center Express shuttle card in order to board. The shuttle operates on 20 minute headways from 6:00 AM to 9:45 AM and 3:30 PM to 7:10 PM for service to Metrorail, as well as at 10 minute headways from 11:30 AM to 2:00 PM for lunchtime service to restaurants and shops. Figure 3-7 provides a map of the Mark Center Express shuttle route and stops for both the Metrorail and lunch time services.

Mark Center tenants CNA and IDA also provide private shuttle services to Metrorail stations; however, shuttle service is provided for CNA and IDA employees only with proper identification.

The Duke Realty Corporation, CNA, and IDA shuttles will not be available to BRAC 133 employees, as these services are private shuttles offered only for tenants and employees of the respective organizations. However, to accommodate to BRAC 133 employees, private DoD shuttle services are being provided for BRAC 133 employees, as described in the following section.

Figure 3-7: Mark Center Express Route Map



Source: Duke Realty Corporation

3.5.2 DoD Shuttles

As shown in Table 3-3, which presents the DoD shuttle plan, DoD shuttles will operate frequent service between BRAC 133 and five key Metrorail stations: Pentagon, King Street, Ballston, West Falls Church, and Franconia-Springfield.

Service will operate Monday through Friday from 5:30 AM to 7:30 PM. During peak hours (6:30 AM to 9:30 AM and 3:30 PM to 6:30 PM) all routes will operate on 10-minute headways with the exception of the West Falls Church route which will operate on 15-minute headways. During off-peak hours service will be provided between BRAC 133 and the Pentagon every 15 minutes and between BRAC 133 and Franconia-Springfield every 30 minutes. The service will be provided through a combination of vehicles depending on the route. The West Falls Church route will be served by 25-passenger vehicles, King Street route by 30-passenger vehicles, Ballston and Franconia-Springfield route by 35-passenger

vehicles, and the Pentagon route by 45-passenger vehicles. Preliminary proposed routing for these routes is shown in Figure 3-8. Overall, the shuttle plan provides capacity to serve 3,000 employees during peak periods, or 47 percent of the employee population. Regulations governing DoD bus transportation services allow the Secretary of Defense to authorize modified shuttle bus service for employees and contractors between transit centers and BRAC 133.

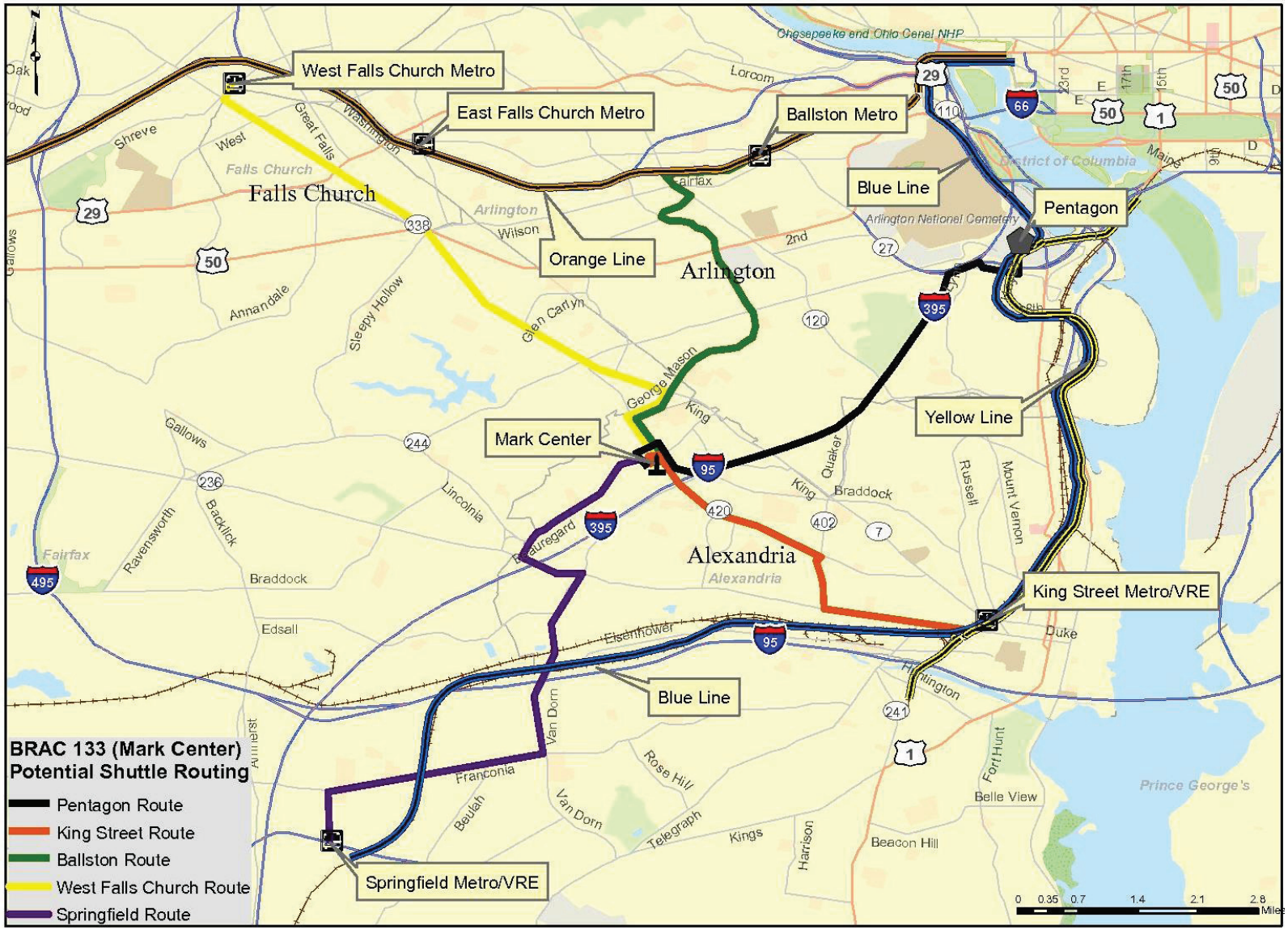
Table 3-3: DoD Shuttle Plan

Route	Number of Seats per Bus	Number of Runs per Hour		Capacity		
		Peak	Off-Peak	AM Peak	PM Peak	Off-Peak
King Street Route	30	6	0	540	540	-
Pentagon Route	45	6	4	810	810	1,440
Ballston Route	35	6	0	630	630	-
West Falls Church Route	25	4	0	450	450	-
Franconia-Springfield Route	35	6	2	630	630	560
TOTAL				**3,060**	**3,060**	**2,000**

Source: WHS

As the exact demand at each Metrorail station cannot be anticipated at this time, and as demand will change over time as employees move and/or as changes occur to local transit options, WHS will monitor the use of the shuttles on a periodic basis and make adjustments to reflect actual ridership and demand. This will be especially important during the first 6 months as employees adjust to their new commute. At the 3-month and 6-month mark WHS will conduct a detailed analysis of ridership trends to determine if adjustments are needed at that time, and annually thereafter. On-board passenger counters on each vehicle will facilitate ease and accuracy of data collection.

Figure 3-8: Potential Shuttle Routing



Source: WHS

3.6 Parking

3.6.1 BRAC 133 Parking

As was previously shown in the site plan in Figure 3-1, there are two parking garages, one of which is within the secure perimeter. The North Parking Garage (located outside of the secure perimeter), will contain 2,032 parking spaces while the South Parking Garage (located within the secure perimeter) will contain 1,715 spaces for a total of 3,747 parking spaces in total between the two garages. It should be noted, however, that a number of these parking spaces will be set aside for particular uses as described below:

- **Disabled Parking:** BRAC 133 will have 48 disabled parking spaces per ADA requirements[32]. These parking spaces will be located at the ground level in the South Parking Garage in order to be located within shortest walking distance to building entry. An additional three ADA parking spaces will be located in the visitor parking section of the North Parking Garage. It should be noted that in order to qualify for a disabled parking permit, employees must first apply for a permit and supply a physician's certification from a medical evaluation deeming the applicant as disabled.
- **Carpool/vanpool Parking:** There will be a large number of preferential parking spaces that are set aside for carpools/vanpools, as the building is being designed to meet LEED Gold standards and requirements for LEED Gold certification[33], The North Parking Garage contains 320 parking spaces that will be reserved for carpools and vanpools. In the event there is a higher demand for carpool/vanpool parking than allocated, WHS will meet the demand. Carpool/vanpool parking will not be capped.
- **Alternative Fuel and Low/No Emission Vehicle Parking:** Also in line with LEED Gold certification requirements, a large number of parking spaces are set aside for alternative fuel vehicles, low/no emission and/or fuel-efficient vehicles. There are 192 spaces reserved for alternative fuel vehicles (including ultra low sulfur diesel, CNG, LNG, electric, fuel cell, E85, as well as an average B50 biodiesel in a standard diesel engine), low-emission vehicles, and fuel-efficient vehicles (ZEVs), located in the South Parking Garage.
- **Government Vehicles:** There will be a total of 150 parking spaces set aside for government vehicles.
- **Visitor Parking:** There are a total of 67 visitor parking spaces which are all located in the North Parking Garage, outside of the secure perimeter. This section of the garage is separate from the main garage, and access will be controlled manually by PFPA PMB staff working from the VCC. Visitor access was previously described in detail in Section 3.2.3, Internal Site Access.

[32] Section 4.1.2 of ADA Accessibility Guidelines for Buildings and Facilities, http://www.access-board.gov/adaag/html/adaag.htm#4.1 (last accessed May 10, 2010).
[33] "LEED-NC Application Guide for Multiple Buildings and On-Campus Building Projects", October 2005, http://www.usgbc.org/ShowFile.aspx?DocumentID=1097 (last accessed May 10, 2010).

3.6.2 Park and Ride Lots

As the BRAC 133 commuter population is greatly dispersed throughout the region and mostly concentrated around transit corridors, and as over 40 percent of commuters will use alternative modes of transportation, including transit, slugging, and vanpooling, commuters may need to take advantage of park and ride lots that are available throughout the region. As shown in Figure 3-9, many park and rides are located in areas highly concentrated by BRAC 133 employees, making park and rides a convenient option for commuters who decide to utilize transit, carpooling, vanpooling, and/or slugging. Currently, many park and ride lots are underutilized and have excess capacity to accommodate much of the BRAC 133 commuting population. Table 3-3 illustrates the region's overall park and ride lot capacity while Table 3-4 illustrates WMATA-operated park and ride capacities for select Metrorail stations in Northern Virginia. See Appendix E for details on regional park and ride lot capacities and select park and ride utilization rates.

Table 3-4: Regional Park & Ride Parking Capacity

Park and Ride Locations	Parking Capacity
Maryland or DC	61,273
Fairfax County	10,059
Other NoVA	13,087
Metro Rail Station	17,973
Total	**102,392**

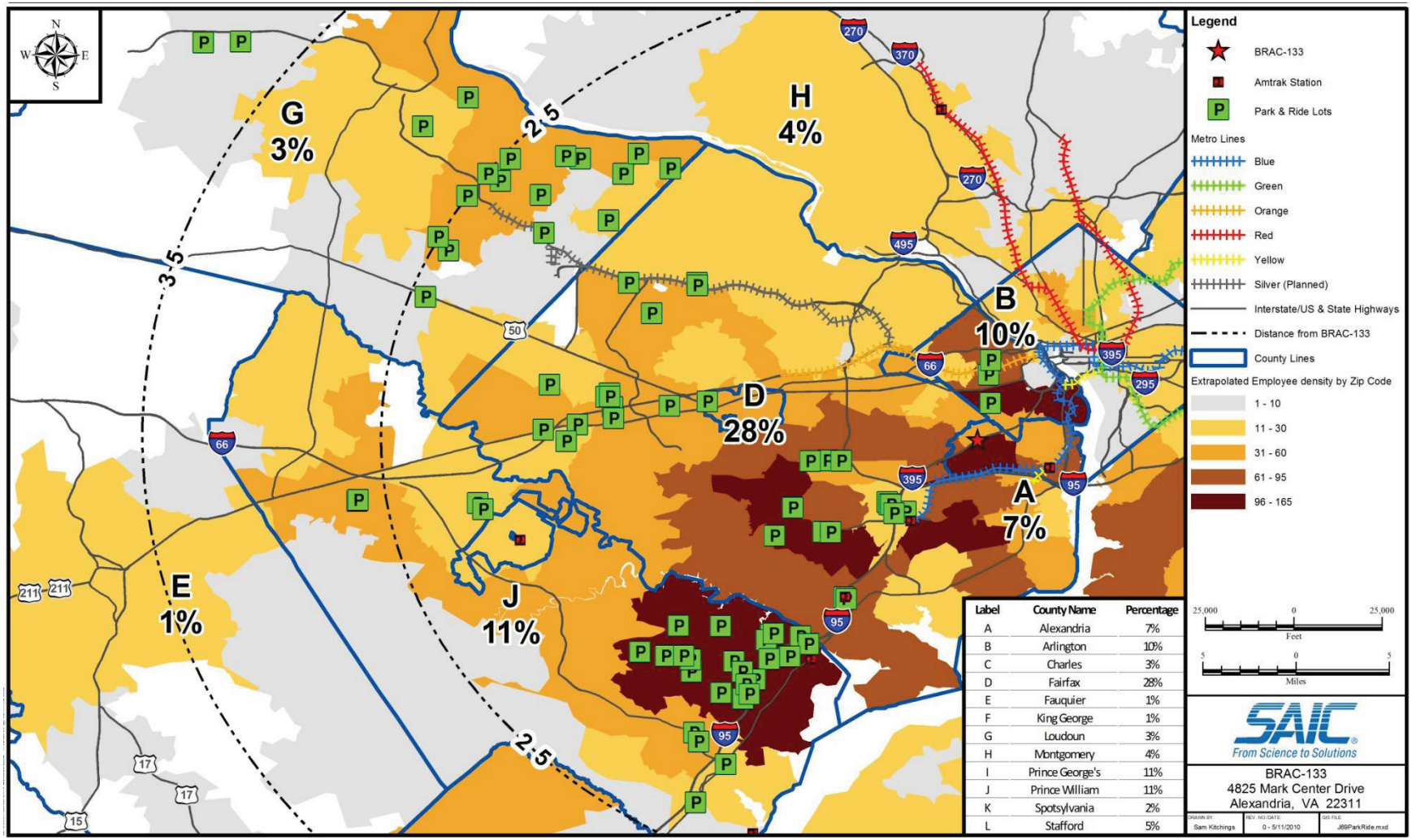
Sources: VDOT;
MWCOG Commuter Connections Website, http://www.mwcog.org/commuter2/commuter/ridesharing/prlocations.html, last accessed May 1, 2010.
Arlington County Commuter Page, http://www.commuterpage.com/parkandride.htm, last accessed May 1, 2010.

Table 3-5: Parking Capacity for Select Metrorail Stations in the Region

WMATA Metrorail Park & Rides	Parking Capacity
Huntington	3,617
West Falls Church	2,009
Dunn Loring	1,326
Vienna	5,169
Franconia-Springfield	5,069
Van Dorn	361
East Falls Church	422
TOTAL	**17,973**

Source: MWCOG Commuter Connections Website, http://www.mwcog.org/commuter2/commuter/ridesharing/prlocations.html (last accessed May 1, 2010).

Figure 3-9: Park and Ride Lots in Northern Virginia Relative to BRAC 133 Employees



Source: ESRI, VDOT