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.

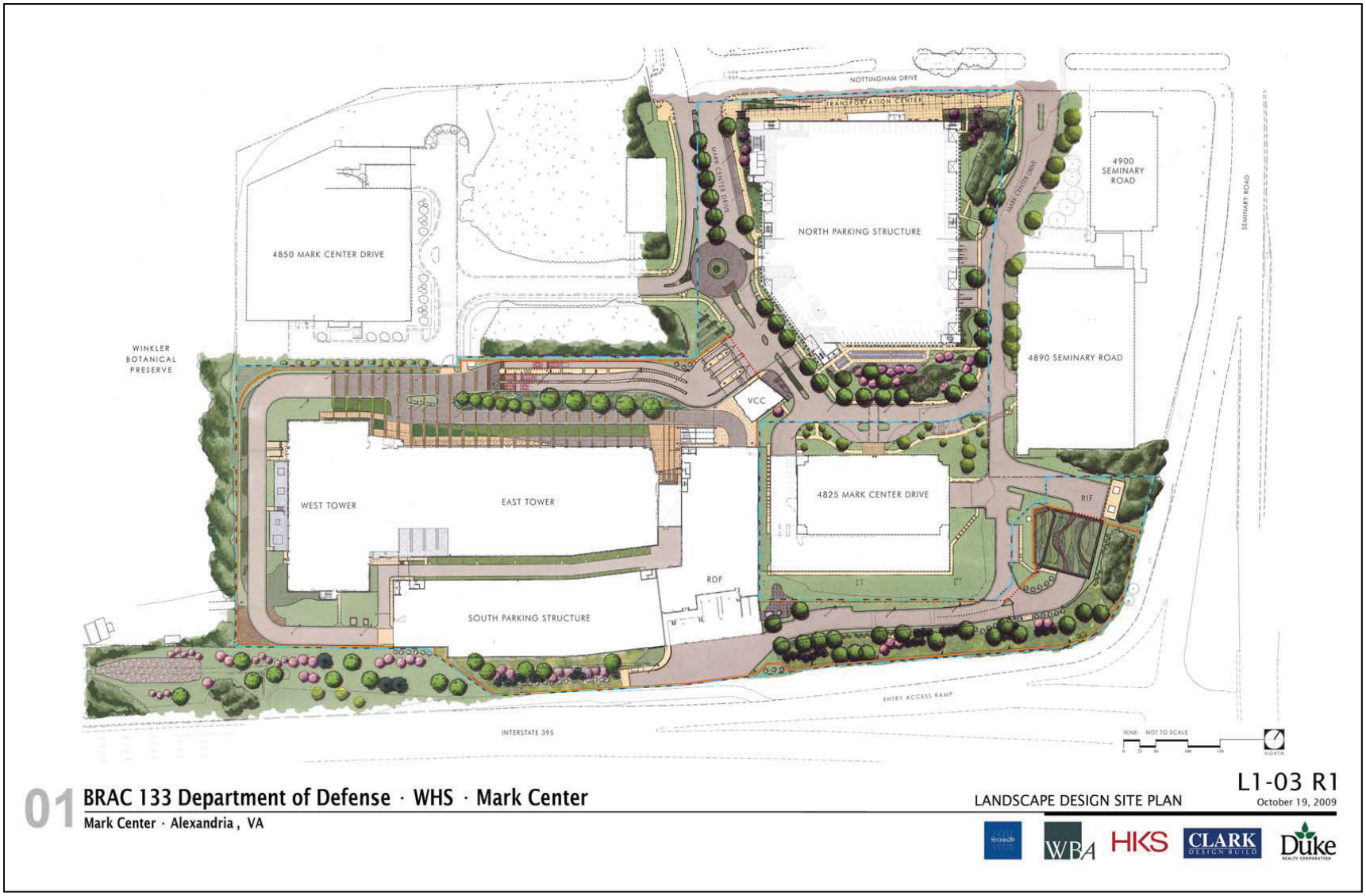
The BRAC 133 facility is a 16-acre site which was master-planned and approved in 2004 by the City of Alexandria for a development of this size and character[18]. The site plan shown in Figure 3-1 displays the 1.8 million square feet of office spaces in two towers located on the southwest corner of the site. Parking structures are located to the south of the office buildings along I-395 (South Parking) 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[19].

The office complex is being designed and constructed to achieve a LEED "Gold" rating[20], 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 achieve 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.

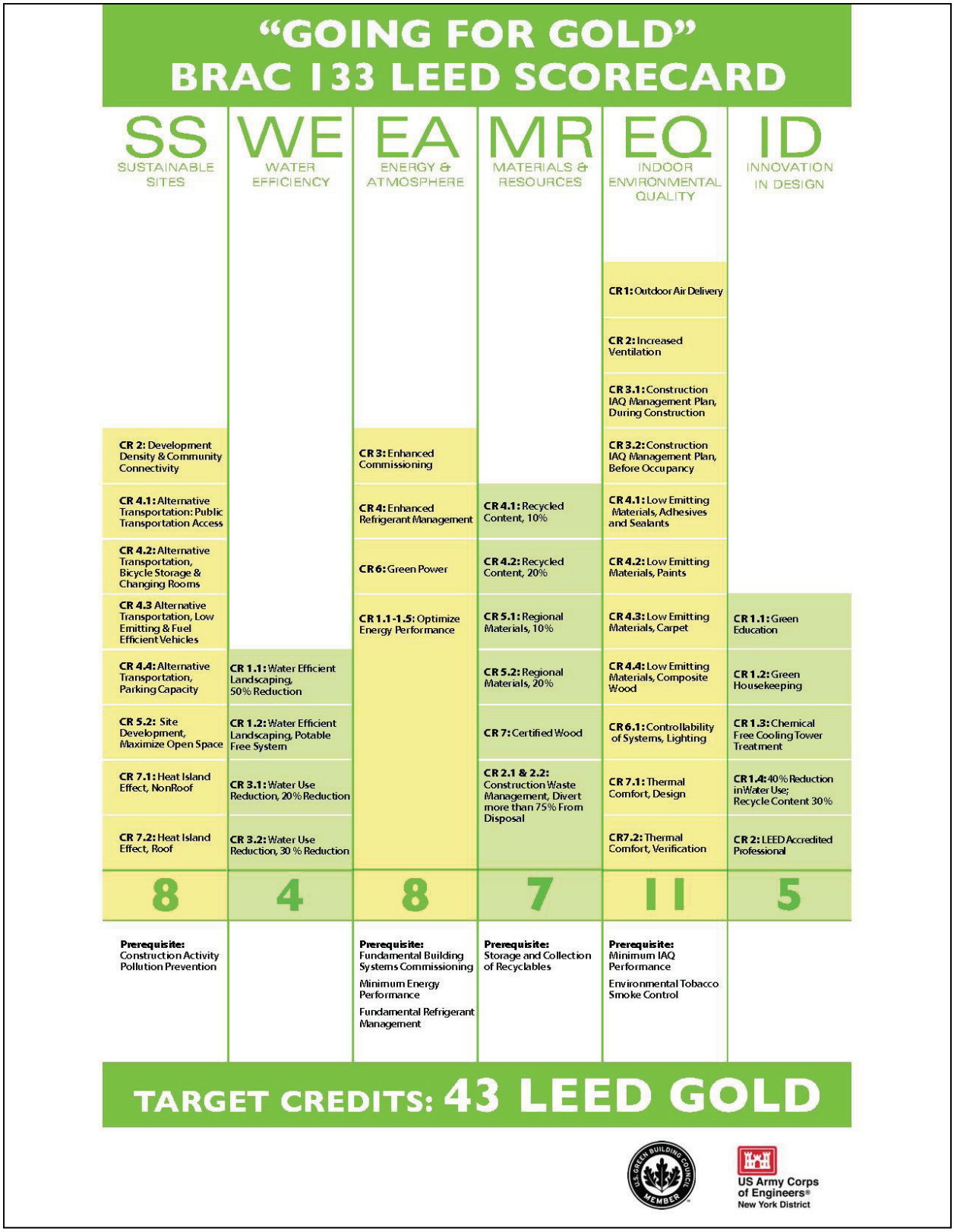
[18] Special Use Permit Certificate issued to the Mark Winkler Company, February 17, 2004.
[19] Belvoir New Vision - DoD BRAC 133 Project at Mark Center web page, http://www.belvoirnewvision.com/files/FINAL_BRAC133_Website_Collateral%5B1%5D.pdf (last accessed April 12, 2010).
[20] U.S Green Building 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 east of the site.

The existing site traffic from 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 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 general purpose (GP) facility with a barrier separated two-lane HOV facility in the median. The freeway 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. 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 weekday. 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.

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 overpass over I-395, 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 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 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 I-395 north and southbound movements at Seminary Road interchange is prevented from accessing Mark Center Drive at Seminary Road intersection by a white solid dividing stripe. Only the westbound Seminary Road traffic can legally execute left turns at 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 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. However, through observation of traffic, drivers usually violate this solid stripe and make left turns from I-395 ramps to access Mark Center Drive. The solid white stripe has been placed to discourage this maneuver.

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 the 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 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)*[21] 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 and promote traffic safety along Seminary Road. Most of the I-395 exit ramp traffic accessing Mark Center violates the existing solid pavement marking barrier that prohibits left turns to Mark Center Drive from Seminary

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

Road. 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. Therefore, the proposed offsite roadway improvement will include a solid obstruction to prohibit this lane change maneuver in the future.

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. Elimination of the I-395 ramp traffic from accessing Mark center via the intersection of Seminary Road and Mark Center Drive by providing a concrete barrier obstruction. This site access will be allowed for eastbound Seminary Road traffic only

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

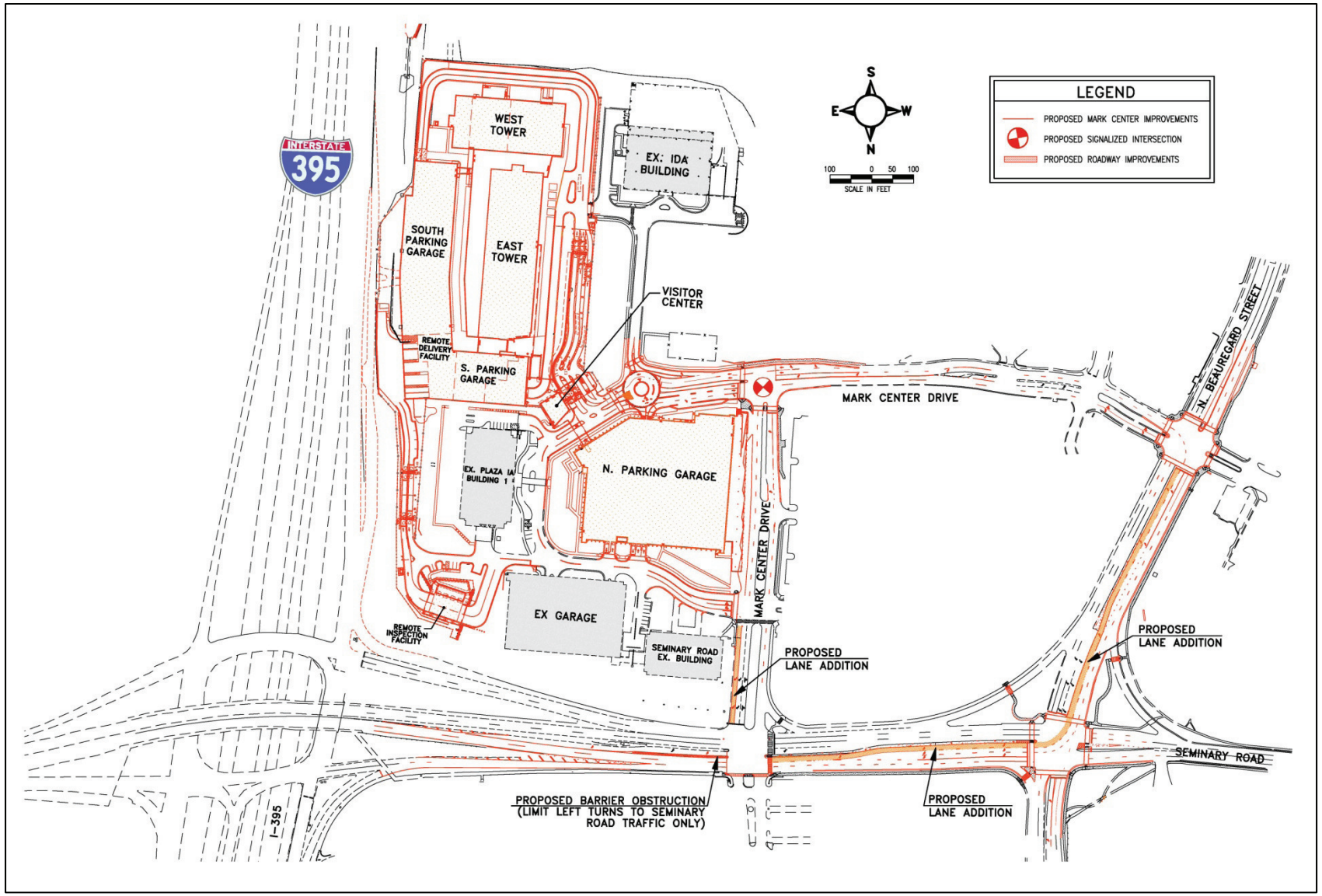
Besides these short-term improvements, other additional short-term and long-term improvements including roadway widening and traffic control improvements, and a direct HOV access ramp from I-395 South to Seminary Road[22] are currently being considered and evaluated[23].

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 potential funding opportunities.

These long-term improvements would enhance the traffic flow and operations of this site as well as the regional traffic.

[22] Virginia Department of Transportation Mega Projects web page, http://www.vamegaprojects.com/faqsdocuments/mark-center-documents/ (last accessed April 5, 2010).
[23] City of Alexandria, "Planning & Zoning: Base Realignment & Closure (BRAC-133)" web page, http://alexandriava.gov/BRAC (last accessed May 5, 2010).

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



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

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 serve as a loop road providing access to both North and South parking garages, visitor parking areas 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[24].

The proposed BRAC 133 developments can be divided into the North Campus, South Campus and the Remote Inspection Facility (RIF)[25]. The North Campus includes the North Parking Garage and the Transportation Center. The South Campus is the largest area of the site including the South Parking Garage, WHS east and west towers, Visitor Center, and 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, via the WHS Circle and 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 and 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 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 one day prior to visiting the site. When arriving at the site, the visitor credentials will be verified by the PFPA security guard before being permitted into 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.

A proposed RDF will be located adjacent to the South Parking Garage, and will be connected to nearby roads by an access road paralleling I-395 between the South Parking Garage and the Remote Inspection Facility.

A proposed RIF for commercial trucks 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 South Parking Garage via an access

[24] *WHS Internal Roadway Network Traffic Analysis*, Wells and Associates, August 20, 2009.
[25] Fort Belvoir BRAC 133 Project, Mark Center Development, Department of Army Staff Recommendation to NCPC, December 30, 2009.

road paralleling I-395 and enter the facility for vehicle inspection. Any vehicles that fail the scan will be escorted 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.

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 North Beauregard Street and Mark Center Drive intersections, and along both sides of North Beauregard Street from 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 a 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[26].

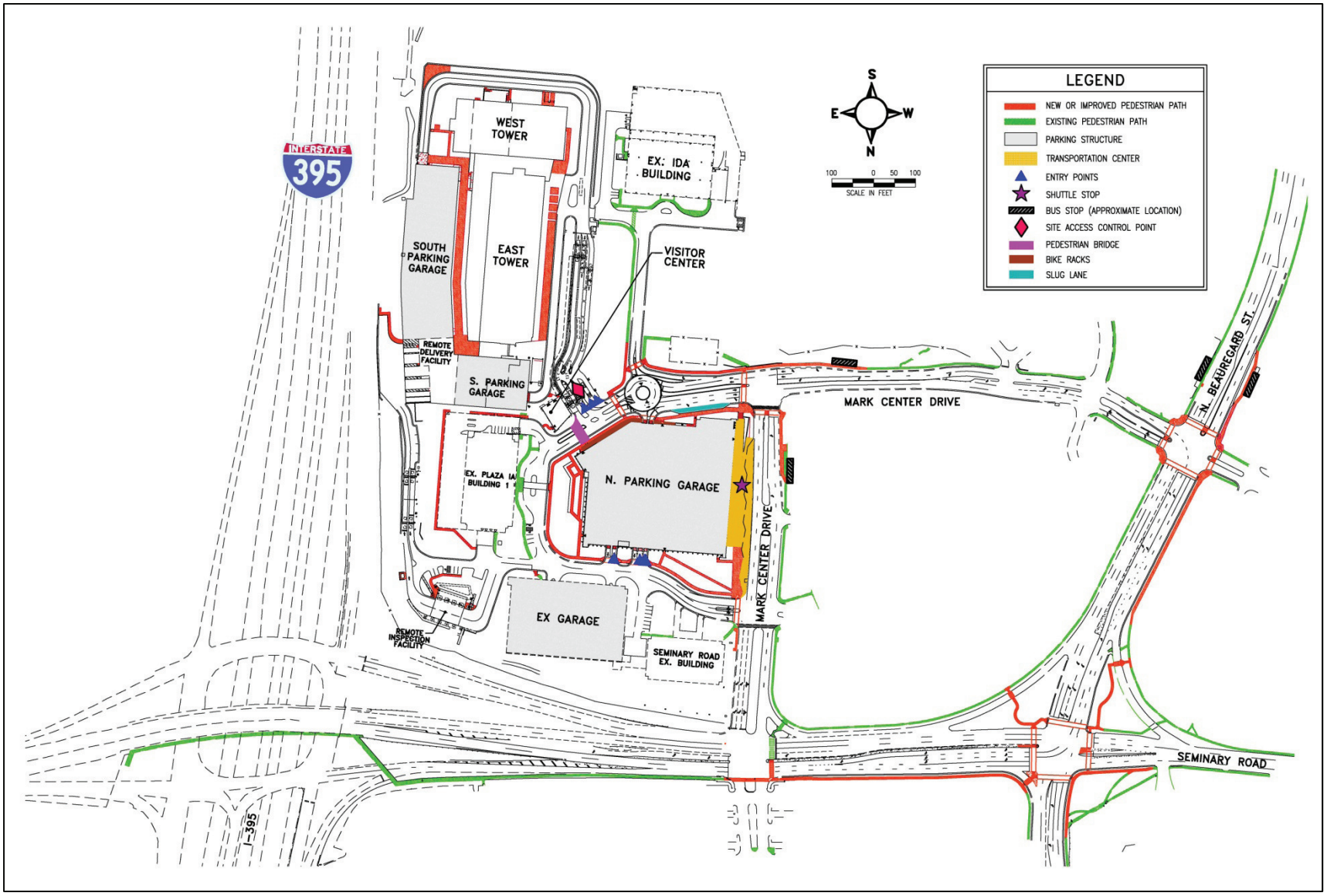
The proposed sidewalk and crosswalk plan as part of the BRAC 133 development promotes connectivity by integrating the existing sidewalks and pathways to the boundary roadways that provide access to the BRAC 133 facility and the internal circulating system. The proposed plan includes improvement of the 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) guidelines 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.

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

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 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. 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[27]. 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 South Parking Garage 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. The AVB at its default position will be down or depressed. The authorized vehicles from the guard booths will stop for a red signal at the AVB location and proceed forward when the indication turns green. Any unauthorized vehicles identified at the guard booth will be guided to a turn-around path adjacent to the guard booth. If failing to obey, the AVB will be activated by the guard and the unauthorized vehicle will be physically restricted from accessing the parking garage and the site. The AVB will be the final denial barrier.

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 AVBs proposed along the two inbound lanes proceeding from the ID check points will also process vehicles at the rate of 350 vehicles per hour per AVB, serving a maximum of 700 vehicles during the highest peak hour demand[28]. 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 commercial trucks, rideshare, or VIP vehicle check-ins, based on the generated 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

BRAC 133 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

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

station, most of the bus routes serving the area lead to a Metrorail destination, in addition to other major destinations.

DASH Service

Alexandria Transit Company currently operates two DASH bus routes that serve Mark Center at the Southern Towers apartment complex and 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 B.

The AT 1 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 AT 2 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 Mark Center at the Southern Towers apartment complex and 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 B.

Route 7 (Lincolnia-North Fairlington Line) operates very frequent service through Mark Center via routes A,B,D,E,F,W, and X. The Route operates 46 runs through Mark Center during the 6:00 AM to 9:00 AM peak period and nine runs through Mark Center during the 3:00 PM to 6:00 PM peak period in the northbound direction, as well as 10 runs through Mark Center during the 6:00 AM to 9:00 AM peak period and 29 runs through Mark Center 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 Mark Center during operating hours.

Route 25B (Landmark-Ballston Line) also operates service to Mark Center. During the 6:00 AM to 9:00 AM peak period, Route 25B operates six runs though Mark Center and six runs through Mark Center during the 3:00 PM to 6:00 PM peak period in the northbound direction, as well as six runs through Mark Center during the 6:00 AM to 9:00 AM peak period and six runs through Mark Center 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 Mark Center during operating hours.

Route 28A (Alexandria-Tysons Corner Line) operates service to Mark Center, with six runs operating during the 6:00 AM to 9:00 AM peak period and six runs through Mark Center during the 3:00 PM to

6:00 PM peak period in the eastbound direction, as well as six runs through Mark Center during the 6:00 AM to 9:00 AM peak period and six runs through Mark Center 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 Mark Center during operating hours.

Route 28G (Skyline City Line) operates limited service to Mark Center, with eight runs operating during the 6:00 AM to 9:00 AM peak period in the northbound direction, as well as eight runs through Mark Center 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 Mark Center during operating hours.

Figure 3-5 illustrates existing public transit service within one 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 (1/2 mile) from the BRAC 133 site.

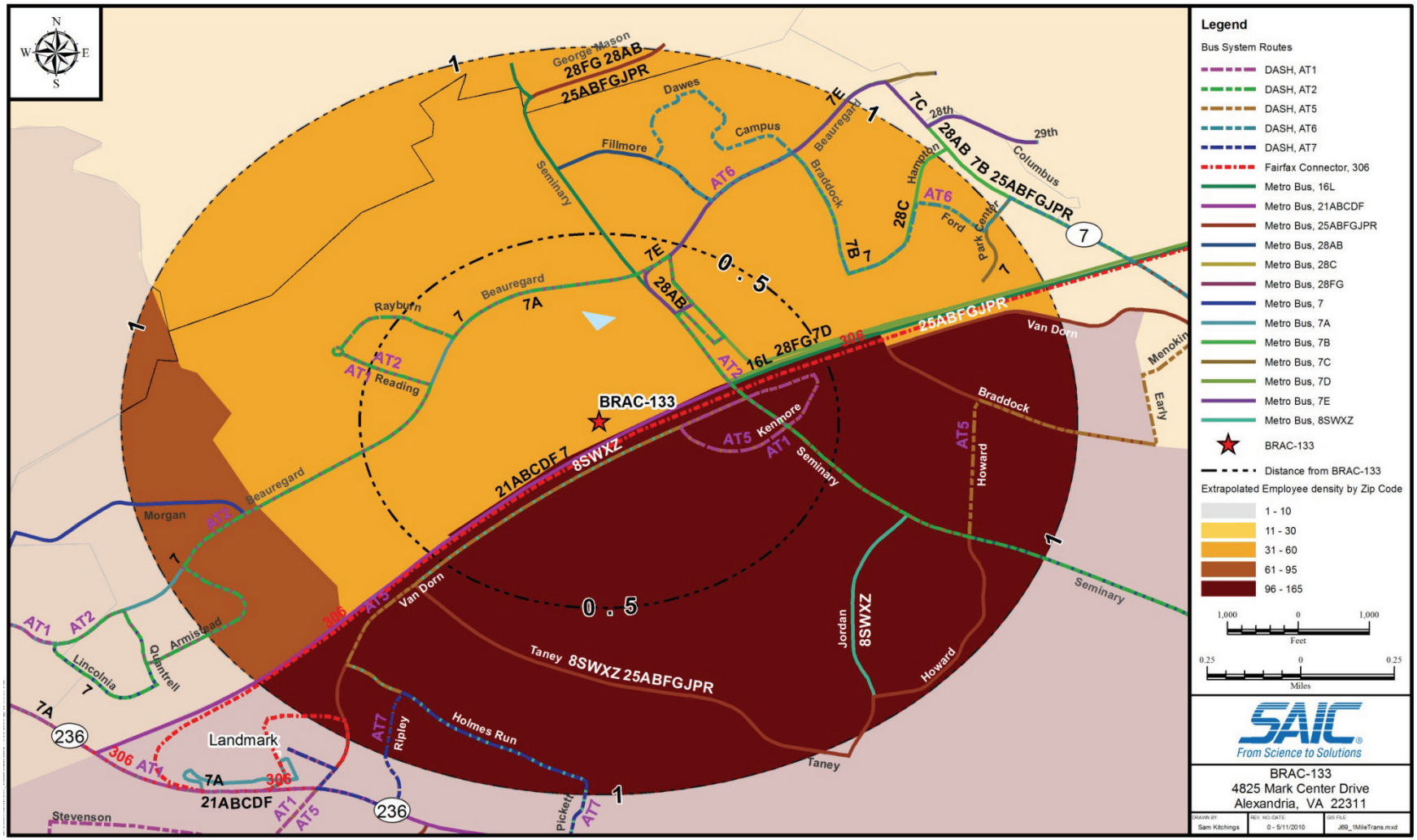
Quick's Bus Service

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 Mark Center 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 B provides information on available public feeder services throughout the region that serve Metrorail and VRE stations.

Figure 3-5: Existing Bus Routes within 1 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	Southern Towers	7	7	18	25	25	30
	Seminary Plaza	Eisenhower/Van Dorn Metro	SB	Southern Towers	7	7	18	30	30	30
AT2	Lincolnia	Braddock Metro	EB	Southern Towers	9	7	19	17	30	30
	Braddock Metro	Lincolnia	WB	Southern Towers	7	9	19	30	20	30
Metrobus - WMATA										
7 A,B,D,E,F,W,X	Lincolnia	Pentagon	NB	Southern Towers	46	9	28	30	30	30
	Pentagon	Lincolnia	SB	Southern Towers	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	Bldgs 4850 & 4900	1	0	0	---	---	---
	Mark Center	Fredericksburg	SB	Bldgs 4850 & 4900	0	1	0	---	---	---

Source: WMATA, DASH, Quick's Bus

NOTE: AM Peak = 6:00 AM - 9:00 AM; 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, 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 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. 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. 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 King Street Metro to BRAC 133	Making adjustments to routes that currently serve nearby areas such as Southern Towers as well as the King Street Metro 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 as Southern Towers to directly serve BRAC 13. These include WMATA's routes 7BDE, 25AD (which serve the Northern Virginia Community College), 25B, 28B, and 28F (which serves the Pentagon and Skyline City), and DASH's route AT1.
	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 Ballston and Van Dorn Metro stations and add stop at BRAC 133	Increasing the frequency of WMATA's 25B route which serves the Ballston and Van Dorn Metro stations 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 Technical Memorandum 4.2 dated January 2010, "Transit Service Impacts of the Base Realignment and Closure Recommendations in the Metropolitan Washington Region."

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). 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.

WHS will be reevaluating the DoD shuttle regularly, to determine if any shuttle service changes are needed as a result of modifications to public or private transit service and/or changes in employee demand for transit.

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 any number of ways. For example, employees who have a parking space may choose to save time by picking up slugs at any number of well-established pick-up locations throughout the southern suburbs (see Appendix C) and driving them to the Pentagon before turning around and returning to the site via the uncongested 1-395 southbound 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.

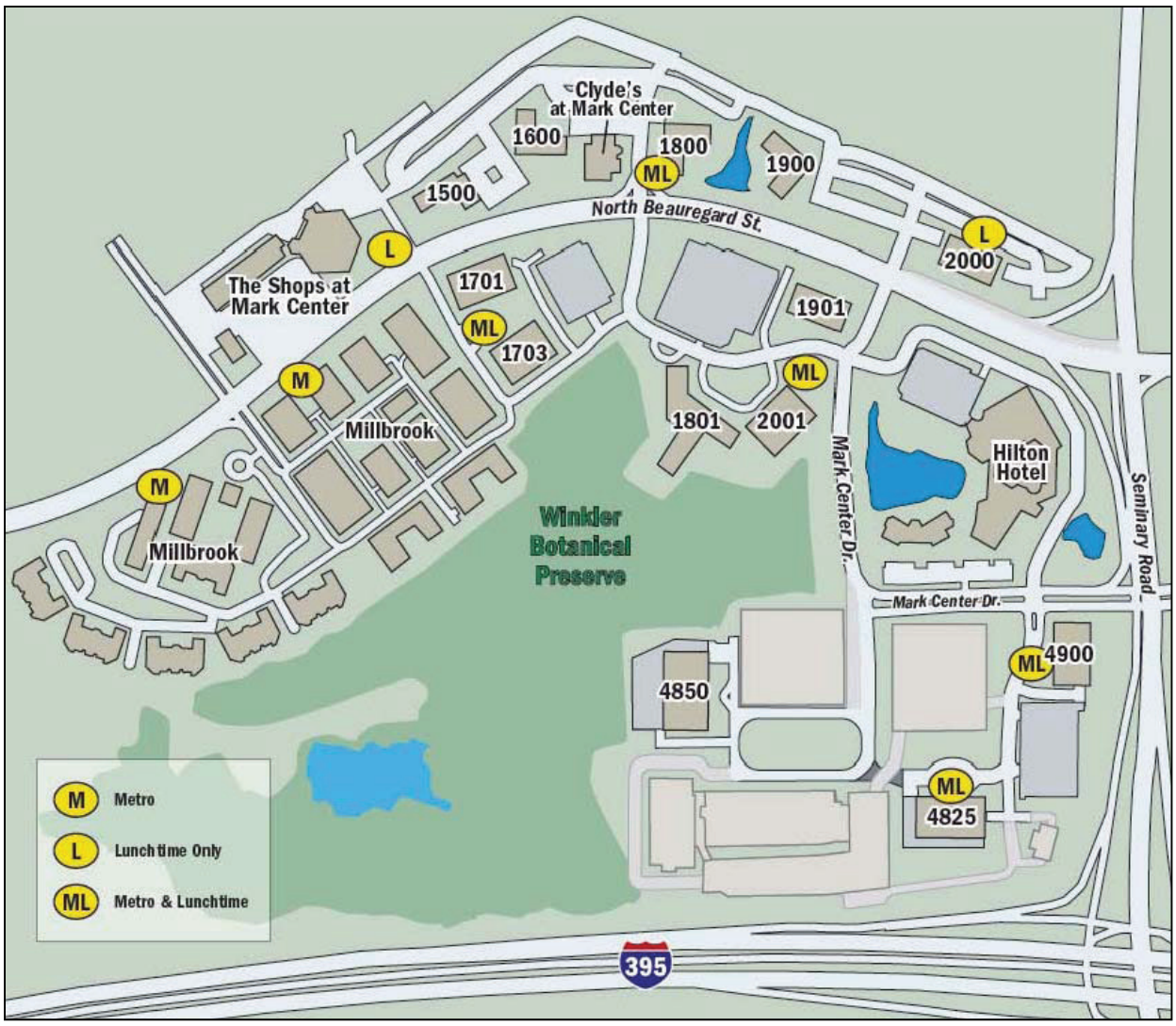
To accommodate to the local custom, the BRAC 133 site includes a designated location for slug lines. The designated slug area is located along Mark Center Drive just to the west of the North Parking Garage. The area will include signage instructing slugs and drivers about appropriate places to queue safely.

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.

Figure 3-7: Mark Center Express Route Map



Source: Duke Realty Corporation

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.

3.5.2 DoD Shuttles

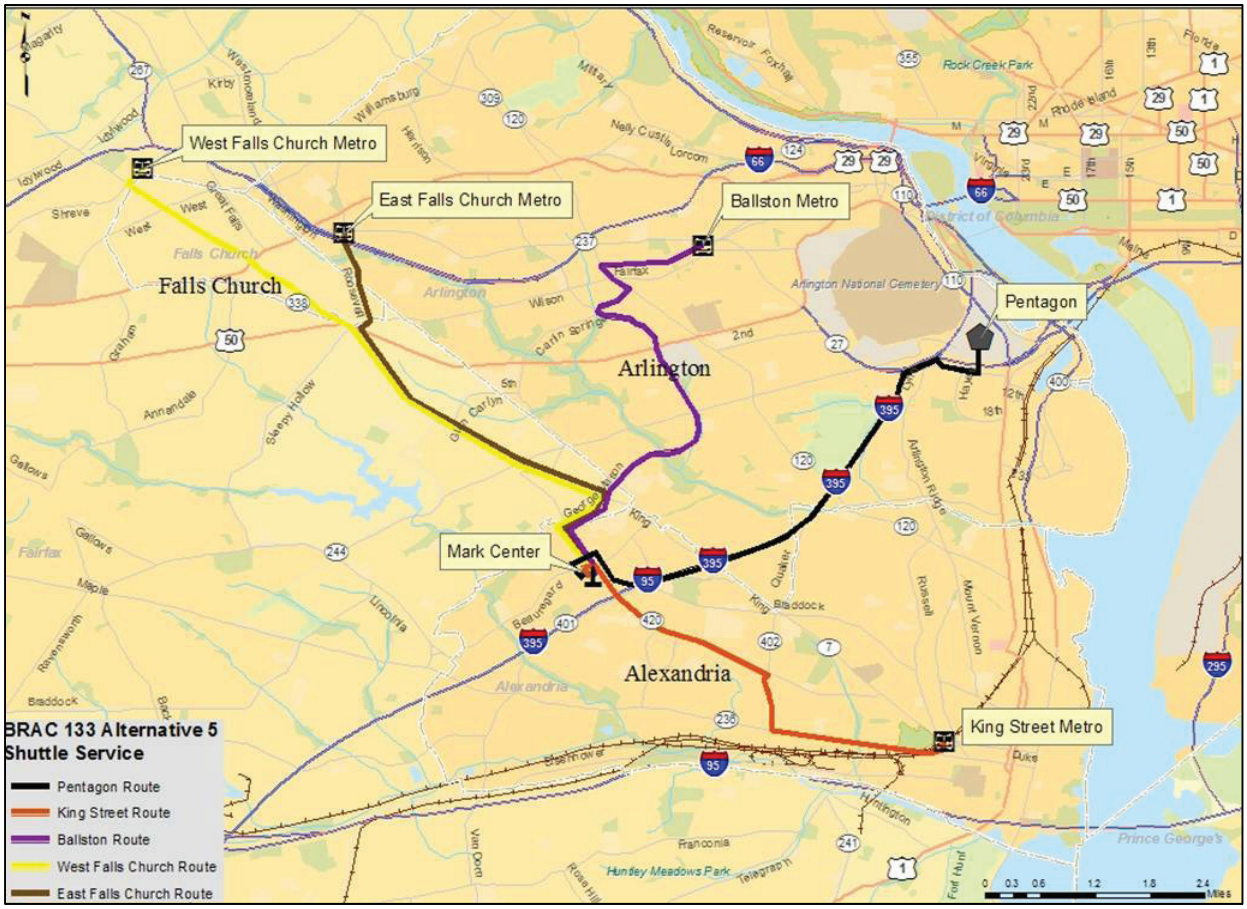
WHS is currently in the process of planning the DoD BRAC 133 shuttle program. Although plans are not final at this time, the plans center on meeting the following requirements: providing capacity to support a 20 to 40 percent mode split; providing 10-minute or 15-minute headways during peak hours; and providing connections to Metrorail Orange, Yellow, and Blue Lines, as well as VRE.

At this time WHS is looking at a variety of alternatives to provide service between BRAC 133 and key Metrorail stations. At a minimum there will be service between BRAC 133 and the Pentagon and the King Street Metro Station. The Pentagon was selected since it serves as a major transit hub for the region and it is expected that employees will need to travel between BRAC 133 and the Pentagon throughout the day. The King Street Metro Station was selected since it serves VRE as well as both the Blue and Yellow Lines. In addition there will be service between BRAC 133 and one or more Orange Line stations. WHS is currently exploring options for service to Ballston, East Falls Church, and West Falls Church. WHS is also exploring possibilities to provide service to additional Blue or Yellow Line stations beyond the King Street Station.

According to the preferred option, service is proposed to operate Monday through Friday from 5:30 AM to 8:30 PM, with 10-minute or 15-minute headways during peak hours (6:30 AM to 9:30 AM and 3:30 PM to 6:30 PM) and 30-minute headways during off-peak hours. Preliminary proposed routes are shown in Figure 3-8. The service will be provided through a combination of vehicles including 25-passenger vehicles, 35-passenger vehicles, and 45-passenger vehicles. Vehicle sizes will vary depending on the route and/or time of day.

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 an 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. After that time, they will conduct a study annually for the first 3 years and then biannually after that point. On-board passenger counters on each vehicle will facilitate ease and accuracy of data collection.

Figure 3-8: Preliminary Proposed Shuttle Routes



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[29]. 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.

[29] 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).

- **Carpool/vanpool Parking:** As the building is LEED Gold certified[30], there will be a large number of preferential parking spaces that are set aside for carpools/vanpools. The South 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).
- **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.

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 Metro-operated park and ride capacities for select Metrorail stations in Northern Virginia. See Appendix D for details on regional park and ride lot capacities and select park and ride utilization rates.

[30] "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).

Table 3-3: 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**

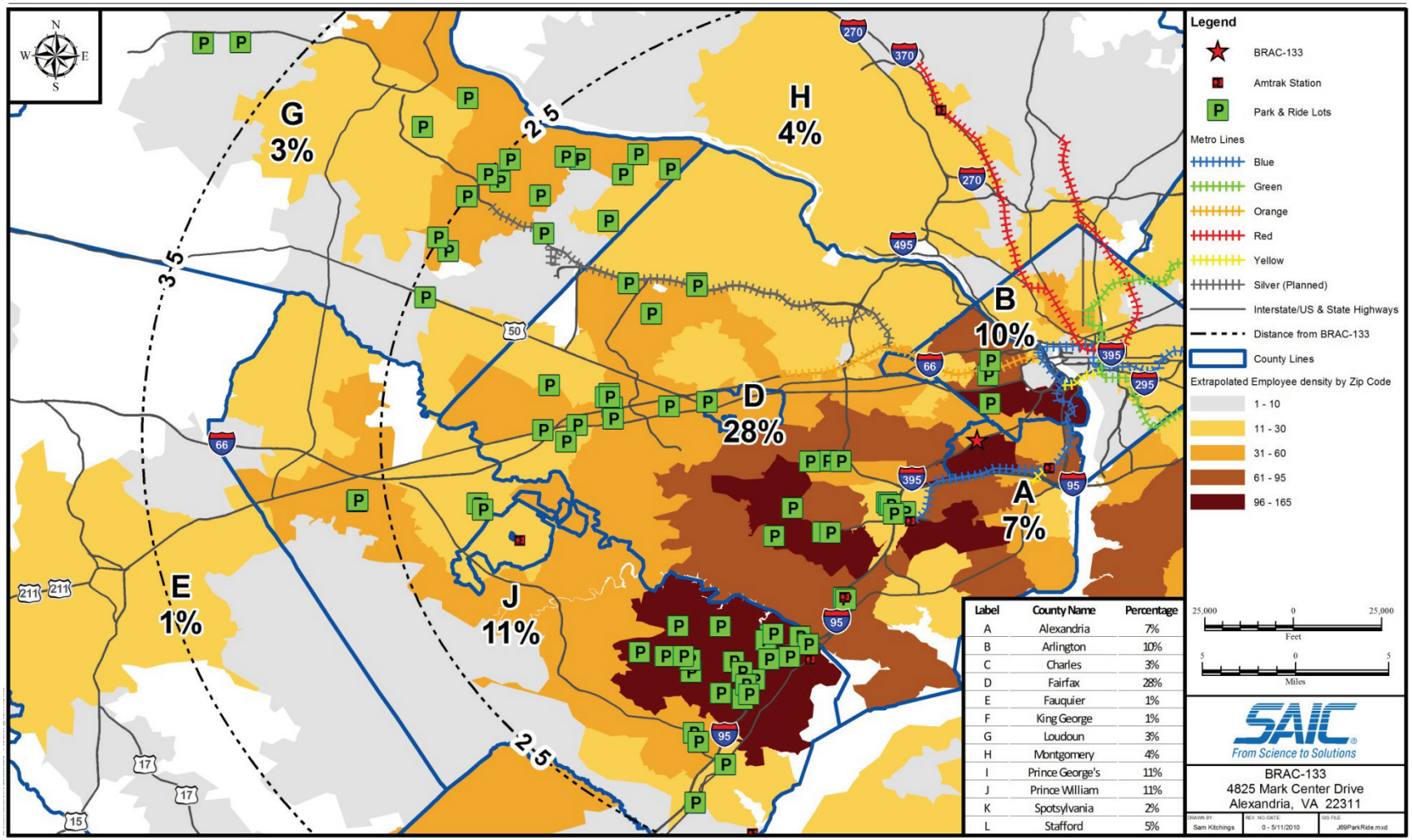
Sources: VDOT;
MWCOG Commuter Connections Website, http://www.mwcog.org/commuter2/commuter/ridesharing/prlocations.html, last accessed May 1, 2010.
Arlington County Commuter Page, http://www.commuterpage.com/parkandride.htm, last accessed May 1, 2010.

Table 3-4: Regional Park & Ride Parking Capacity

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