



DEPARTMENT OF THE NAVY
BUREAU OF MEDICINE AND SURGERY
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IN REPLY REFER TO

11210
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02 May 2008

From: Chief, Bureau of Medicine and Surgery
To: Director, Surface Deployment and Distribution Command, Transportation
Engineering Agency (SDDC)

Subj: DEFENSE ACCESS ROAD (DAR) NEEDS REPORT - NATIONAL NAVAL
MEDICAL CENTER (NNMC) BETHESDA

Encl: (1) Access Road Needs Report for Implementation of the 2005 Base Realignment
and Closure Actions at National Naval Medical Center, Bethesda, Maryland

1. The Bureau of Medicine and Surgery requests that SDDC evaluate two off-base transportation projects for NNMC Bethesda as detailed in enclosure (1) for possible funding under the Defense Access Road (DAR) Program.
2. With the implementation of the consolidation of Walter Reed Army Medical Center and National Naval Medical Center (NNMC) Bethesda as mandated by Base Realignment and Closure (BRAC) law, additional traffic will be generated in an already congested urban area. This increase in traffic constitutes an unusual impact to the surrounding community due to the timeframe for BRAC implementation and the unique nature of the merger of the two facilities in a highly developed urban area.
3. NNMC Bethesda has been working with the local community, Montgomery County Department of Public Works, and the Maryland Department of Transportation to identify congested areas and potential improvements to the transportation network surrounding the facility. The State of Maryland has programmed improvements for some of the surrounding intersections to address the current congestion issues. The two projects proposed for DAR Certification are not under consideration for the State of Maryland funding.
4. Neither the State of Maryland nor Montgomery County has been provided adequate time to provide funding to address the impacts of the significant increase in traffic before the BRAC action is implemented. Certification of the proposed projects by the DAR Program will allow the Department of Defense to pay its fair share of the costs required to relieve problems caused by the increase in traffic as a result of the consolidated medical center.
5. The Navy point of contact for this action is Mr. Andrew Gutberlet, (301) 295-2404 or andrew.gutberlet@navy.mil.

A handwritten signature in black ink that reads "R. L. Sollock".

R. L. SOLLOCK
By direction

Access Road Needs Report for Implementation of the 2005 Base Realignment and Closure Actions at National Naval Medical Center, Bethesda, Maryland

This Access Road Needs Report is developed to identify potential projects for the Defense Access Road (DAR) Program. The following projects are identified as necessary to address future access road congestion on the transportation network surrounding the National Naval Medical Center (NNMC), Bethesda, MD. These projects are presented in priority order according to needs identified by NNMC in coordination with Montgomery County, the State of Maryland, the Washington Metropolitan Area Transit Authority and local planning agencies.

- A bank of elevators on the east side of Rockville Pike (MD 355) providing direct pedestrian access to Medical Center Metrorail Station. This improvement will address a series of issues including a potential doubling of users from NNMC, safety concerns for pedestrians crossing Rockville Pike, and the backup of exiting traffic from the facility.
- Improvements to the North Wood Road/Rockville Pike intersection to include a signal analysis, an additional left turning lane, and additional storage in the existing turning lane. These improvements will minimize the backup of traffic into the travel through lanes of Rockville Pike. In addition, the improvements will significantly improve through-traffic flow and will improve safety at the gate intersection.

The Traffic Study from the Base Realignment and Closure (BRAC) Bethesda Environmental Impact Statement (EIS) is included as Appendix A to this report for reference.

Introduction

The consolidation of Walter Reed Army Medical Center and NNMC, Bethesda to form the Walter Reed National Military Medical Center (WRNMMC) will create a premier military health care command. WRNMMC will serve as the premier Department of Defense (DoD) medical center with a full range of intensive and complex specialty and subspecialty medical services, including specialized facilities for the most seriously injured service members. This facility will serve as the U.S. military's worldwide tertiary referral center for casualty and beneficiary care. The accessibility of WRNMMC will be essential to its continued service as the military's premier medical center. The proposed projects to improve the surrounding transportation network will ensure the WRNMMC is accessible at all times to the military community and are therefore important components of national security.

NNMC Bethesda is located within the Washington, DC beltway in a highly developed area of Bethesda, Maryland. NNMC is surrounded by the National Institute of Health

(NIH) to the west; Stone Ridge School of the Sacred Heart and residential housing to the north; North Chevy Chase Recreation Center, residential housing, and Rock Creek Park to the east; and Columbia Country Club, residential housing, parks, and a golf course to the south. The Capital Beltway, Interstate 495 (I-495), is adjacent to the NNM northeast corner. Figure 1 shows the surrounding roadway network and shows the intersections studied in the course of conducting the NNM Bethesda BRAC EIS.

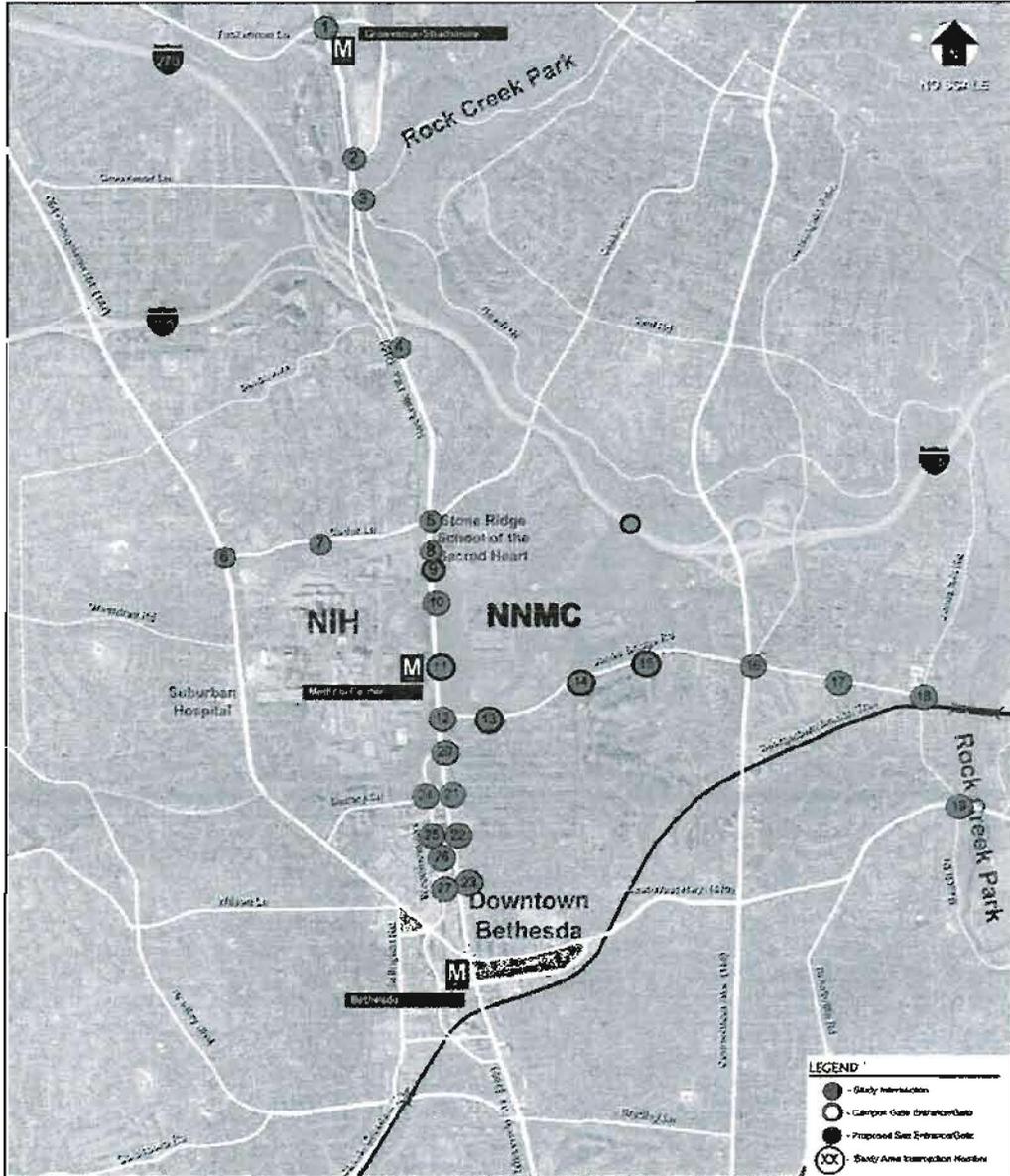


Figure 1: Local Roadway Network Evaluated in BRAC Bethesda EIS.

NNMC is accessed through five gates serviced by two major off-post roads, Rockville Pike and Jones Bridge Road. Intersection diagrams can be found in the traffic study (Appendix C of the EIS) for all study intersections including the North Wood Road and South Wood Road intersections with Rockville Pike which have projects that are proposed for DAR Program certification.

NNMC is also located adjacent to the Medical Center Metrorail station. This station is on the west side of Rockville Pike. Pedestrians using the station to access NNMC cross Rockville Pike at-grade at the corner of Rockville Pike and South Wood Road. The station provides customers of the Metrorail and Metrobus systems with access to NIH and NNMC.

As described in the following sections, this BRAC action will cause an unusual defense-generated transportation impact and DAR Program approval is appropriate to address roadway congestion issues. The roadway and transit projects identified below will provide urgently needed relief to an existing transportation network where traffic will suddenly increase due to the expanded workforce and patient load expected to result from the BRAC action at NNMC.

Description of Deficiencies in Existing Transportation Network

The DAR Program provides the means for DoD to pay a fair share for public highway improvements required as a result of a sudden or unusual defense-generated traffic impact or unique defense public highway requirement. This section will demonstrate that although the proposed projects do not provide new connections or provide relief for a doubling of traffic, they do readily meet the criteria of subsection (c) of the FHWA Federal-aid Policy Guide (FAPG), non-regulatory supplement, subpart E, part 600, Code of Federal Regulations (23 CFR 660 E) by providing projects that avoid intolerable congestion on a non-installation public highway caused by a projected surge in installation-generated traffic.

This section will also demonstrate that the proposed BRAC action at NNMC constitutes a unique and unusual impact with relation to transportation impacts resulting from BRAC actions. It is unreasonable to assume that a doubling of traffic through an intersection would be required to increase the detrimental impact to the intersection by 100%. A doubling of impacts – rather than a doubling of traffic – and the development of intolerable congestion can be demonstrated with the BRAC increase in traffic through the subject intersections.

Appendix A to this Report is the Transportation Study prepared as part of the EIS for this proposed BRAC action. In the Transportation Study the local roadway network is evaluated to determine existing levels of congestion (2007), projected congestion at the time of implementation of the BRAC action (2011), and projected congestion in 2011 after implementation of the BRAC action.

As detailed in the Transportation Study, many intersections surrounding NNMC are currently in excess of county congestion standards. Of the 27 intersections studied as part of the transportation study (See Figure 1), three currently operate above county congestion standards (#5 - Rockville Pike & West Cedar Lane, #12 - Rockville Pike & Jones Bridge Road, and #15 - Connecticut Avenue & Jones Bridge Road), while an additional five intersections operate near capacity. By the time of BRAC implementation in 2011 with regional growth and approved development projects, four intersections will operate above county congestion standards (the above intersections plus #6 - Old Georgetown Road & West Cedar Lane), while an additional four intersections operate near capacity.

The roadways surrounding NNMC Bethesda, specifically Maryland State Highway's (MD) 355 (Rockville Pike), MD 185 (Connecticut Ave), and MD 187 (Old Georgetown Road), are already congested by traffic to and from the significant government agencies, residential neighborhoods and commercial businesses surrounding NNMC. Unlike many BRAC actions proposed for implementation as part of the 2005 BRAC decisions, this realignment will be taking place in an urban area that is already highly developed and the additional defense-generated traffic will add to an already overtaxed roadway network.

Traffic to and from NNMC is a contributor to the existing traffic conditions surrounding the facility during morning and afternoon rush periods. The posted speed on Rockville Pike is 35 mph, but the average speed northbound during the PM peak travel time is 8.8 mph resulting in an average delay of 16.2 minutes. The average speed on Rockville Pike southbound during the AM peak travel time is 14.6 mph resulting in an average delay of 8.2 minutes. The posted speed on I-495 eastbound is 55 mph, but the average speed during PM peak travel time is 11.2 mph resulting in an average delay of 35 minutes. This traffic congestion is a detriment to the mission of the hospital in serving the military community by limiting access to the facility, discouraging visits, and decreasing the quality of life for patients, visitors, and employees of the hospital. Table 1 documents the level of service for the intersections surrounding NNMC and demonstrates the unique nature of the BRAC Bethesda project. Since the roadway network surrounding the military facility is already at critical capacity, it is subject to intolerable congestion from a moderate addition of BRAC-generated traffic.

Table 1 – Critical Lane Volumes (CLV) and Level of Service (LOS) for Rockville Pike corridor near NNMC.

(AM Peak Period)	Existing Conditions		Future Background		BRAC Conditions	
	CLV	LOS	CLV	LOS	CLV	LOS
Rockville Pike & West Cedar Lane	2011	F	2048	F	2100	F
North Drive	1486	E	1503	E	1605	E/F
North Wood Road	1137	B/C	1154	B/C	1401	D
Wilson Drive	1415	D	1432	D/E	1446	D/E
South Wood Road	1150	B/C	1167	B/C	1187	C
Jones Bridge Road	1347	D	1351	D	1365	D
(PM Peak Period)						
(PM Peak Period)	Existing Conditions		Future Background		BRAC Conditions	
	CLV	LOS	CLV	LOS	CLV	LOS
Rockville Pike & West Cedar Lane	1702	F	1784	F	1822	F
North Drive	1240	C	1269	C	1375	D
North Wood Road	1337	D	1366	D	1557	E
Wilson Drive	1502	E	1536	E	1593	E/F
South Wood Road	1135	B/C	1146	B/C	1244	C
Jones Bridge Road	1598	E/F	1680	F	1722	F

North Wood Road and Rockville Pike:

Implementation of the BRAC alternative will add additional congestion to all intersections in the roadway network surrounding the facility. The forecasted increase of inbound AM gate traffic includes an additional 1,430 privately-operated vehicles (POV) on surrounding roadways between 05:00 & 10:00. 1,051 of those POV would arrive between 06:00 & 08:00. This correlates to an additional 209 POV at North Gate during the peak hour of 06:30 – 07:30 for a total (including the current number of inbound traffic) of 843 POV.

One cause of local congestion is the backup of cars from the NNMC security gates due to a lack of adequate storage for cars waiting to pass through security. North Gate at the intersection of Rockville Pike and North Wood Rd is the most heavily used gate on base. The left turn only lane on Rockville Pike southbound into North Gate can store approximately ten vehicles. Due to the timing of lights along Rockville Pike southbound, every five minutes approximately 19 vehicles are queued waiting to turn into North Gate. Ten vehicles are stored in the turn only lane while the remaining nine block one of the three Rockville Pike southbound lanes. When a large vehicle (SUV, Van, or Truck) are in the Rockville Pike northbound left turning lane waiting to turn into the NIH truck

inspection facility, which is directly across from NNMC North Gate, the queue of vehicles on southbound Rockville Pike can reach up to 25 vehicles and completely blocks traffic at the Rockville Pike & Cedar Lane intersection. Figures 2, 3, and 4 show the impact of a left turning truck on traffic and the ability for NNMC traffic to safely make a left turn into the North Wood Road gate.



Figure 2: A left-turning garbage truck blocks the field of vision for left-turning NNMC traffic. This backup causes left-turning traffic to queue up to 25 cars, blocking the nearby Cedar Road/Rockville Pike intersection.

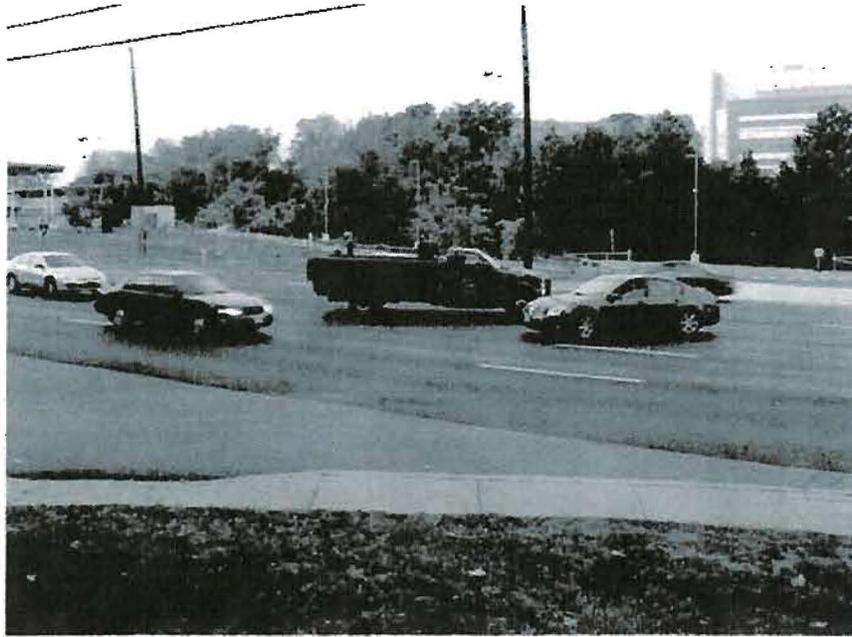


Figure 3: The impacts to the field of vision for left-turning NNMC traffic are demonstrated in this near-accident. Increased use of this left-turning lane after BRAC will increase the number of potential accident scenarios.

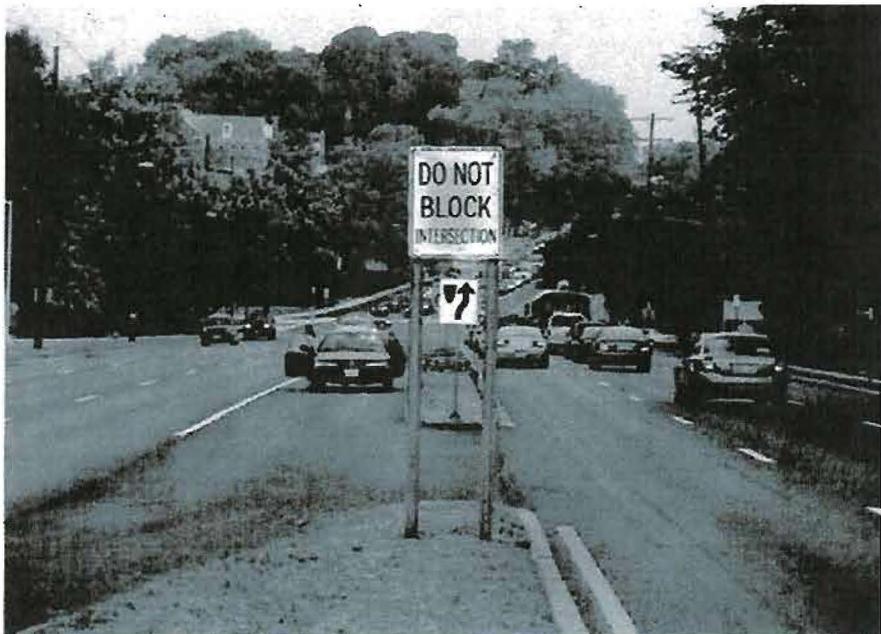


Figure 4: This figure shows that there is adequate space in the median to install a north-bound left turning lane (located at the bottom of this photograph). In addition, the proximity to the currently failing Cedar Lane intersection can be seen in the background.

During rush hour after the BRAC action, it is anticipated that an additional 3.5 vehicles per minute (calculated from the 209 additional vehicles per hour identified above) will be utilizing this intersection. Since the signal timing is currently at five minutes, this means an additional 17-18 vehicles per 5-minute cycle will be waiting to make the left turn into NNMC. As noted above, a queue of only 25 vehicles waiting will block the Rockville Pike/Cedar Lane intersection, which is currently operating well above capacity. The BRAC scenario will have over 36 vehicles waiting to make the left turn on every cycle, thereby causing gridlock in the Rockville Pike/Cedar Lane intersection. The issue described above and in Figures 2-4 in which northbound truck traffic blocks the field of vision for NNMC traffic will only exacerbate this situation. This description offers a clear example of how a less than 100% increase in traffic through this intersection causes a more than 100% increase in the detrimental impact to surrounding intersections. It is also clear that a regular occurrence of gridlock through an already failing intersection will represent intolerable congestion on a non-installation public highway caused by a projected surge in installation-generated traffic.

South Wood Road and Rockville Pike:

The South Wood Road/Rockville Pike intersection serves as the primary pedestrian crossing for mass transit users to access Metrorail and Metrobus service at the WMATA Medical Center Metrorail Station. Metrorail use forms an integral part of the Transportation Management Plan (TMP) at NNMC Bethesda. As part of their regional partnership efforts, NNMC continues to promote the use of mass transit use by employees. Numerous programs outlined in the current TMP document these efforts. It is anticipated that the 2008 update to the TMP and the limited availability of staff parking on NNMC will further promote mass transit use among employees. These increases in mass transit use correlate directly to pedestrian-vehicle conflicts at the South Wood Road/Rockville Pike Intersection and also contribute to the significant backup of traffic in the afternoon rush period onto NNMC.

The current number of employees at NNMC is approximately 8,000. 4,500 of these are employees of the hospital itself, while the remainder are employees of other tenants on the NNMC campus such as the Armed Forces Radiobiology Research Institute (AFRRI) and the Uniformed Services University of the Health Sciences (USUHS). The patient and visitor load on a daily basis is approximately 1,860. Based on a survey of current employees, use of the DoD mass transit subsidy is approximately 30% of staff or 2400 employees. Half of these employees use Metrorail specifically (1200) while the remainder use Metrobus (400) and registered carpools and vanpools (800). After BRAC implementation, an additional 2,500 employees and an additional 1860 patients and visitors are expected to come to NNMC each day. The update to the existing TMP proposed for summer 2008 will also include several new and expanded programs to increase the use of mass transit. The following table outlines current employees, mass transit rates, Metrorail usage and single-vehicle trips to NNMC.

Table 2: Current and Future Employee Transit Usage

	Current	Future (BRAC)
Employees	8000	10500
Patients/Visitors	1860	3720
Employee Mass Transit Use	(30%) or 2400	(30%**) or 3150
Employee Metrorail Use	(15%) or 1200	(15%**) or 1575
Single Vehicle Trips*	7460	11070

*Single Vehicle Trips = 100%(Patients & Visitors) + (70% Employees) to account for mass transit use.

** The table uses 30% employee mass transit use and 15% employee metrorail use consistent with current usage. It is likely that these rates will increase due to a series of factors identified below. Revised goals for the mass transit program will be established as part of the NNMC Master Plan Update of 2008.

A number of factors contribute to the impact at this intersection, and the overall impact to NNMC from the mass transit use by employees of the facility.

1. Increased Ridership

As noted in Table 2, Metrorail ridership will increase by at least 30%. However, this value assumes that the percentage of NNMC employees who use Metrorail will remain at current levels. This assumption is likely to change due to the limited employee parking after BRAC is implemented, and the addition of further programs to promote mass transit use as part of the TMP update. Although 8000 employees currently work on NNMC, about 4500 of those are within walking distance (1/2 mile) from the Metro station. The additional staff added as a result of the BRAC action are nearly all within this 1/2 mile radius from the Metro station. If predominantly 1200 of the 4500 current hospital employees (27%) are currently using Metrorail, it is reasonable to assume that a similar number of the new hospital employees will also use the Metrorail system (675 employees). This would constitute a 56% increase in Metrorail ridership over current levels and would constitute an additional 1350 additional pedestrian crossings each day at this intersection.

A recent employee survey evaluated transit methods for NNMC employees and is included as Appendix B. This study identified the major factors that influence mass transit use by employees. Through the NNMC transportation management plan (to be updated in 2008 as part of the Master Plan update), a number of programs would be renewed or implemented that would increase Metro ridership to include: metrocheck subsidies, flexible work schedules, and the continuation of the shuttle service from the Metrorail station to the NNMC campus. Nearly half of respondents identified that one or more of these programs would influence their choice for mass transit use. It is anticipated that future roadway congestion, limited employee parking on NNMC, and the promotion of Mass Transit alternatives could boost Metrorail ridership to above 25% of employees, increasing NNMC ridership at the station by approximately 130%.

2. Travel Time

Currently, Metro Riders access NNMC via a set of three escalators which are approximately 200 feet long and bring commuters from the station platform 107 feet underground. Transit time on the escalators is 2 minutes 30 seconds. From the top of the escalators, pedestrians then walk about 250 feet to the corner of Rockville Pike and South Drive, cross the six lanes of traffic on Rockville Pike and then enter the NNMC gates (100 feet). At 3.5 feet per second, the walk takes 1 minute 30 seconds plus waiting time for the walk signal at Rockville Pike. During the morning rush, the signal timing allows 7 seconds of 'walk' followed by 20 seconds of flashing 'don't walk', and then 2 minutes 30 seconds for the next cycle. Total travel time between the bottom of the escalators and the NNMC gate ranges from 4 minutes to 6 minutes 30 seconds depending on the traffic signal timing. This travel time constitutes a disincentive towards mass transit use by NNMC employees and imparts a hardship on elderly and/or mobility-impaired employees and visitors to the Medical Center. This is further detailed below.

3. Mobility-Impaired Access

The current elevator at Medical Center is not a high-speed elevator. Travel time from the station platform to the street level ranges up to 5 minutes depending on the wait for the only low-speed elevator. From the street level, pedestrians travel about 120 feet to reach the corner of Rockville Pike and South Drive. Current pedestrian timing for the signal at Rockville Pike is 4 feet per second, which is a very high pace for mobility-impaired pedestrians. Recommended policy changes are under consideration by the State of Maryland to change this rate to 3.5 feet per second in consideration of elderly or mobility-impaired pedestrians.

4. Safety Concerns

Significant pedestrian-vehicle conflicts currently exist at the crossing on Rockville Pike. Current usage from Table 2 suggests 2400 crossings per day over both the morning and evening rush hour periods. An additional 1350 crossings per day are anticipated as part of the BRAC action. These values could be increased significantly through increased Metrorail and Metrobus use by NNMC employees after BRAC is implemented in response to the TMP programs implemented by the facility.

5. Impaired Function of South Wood Road Gate in PM

Pedestrians crossing Rockville Pike from the Medical Center Metro Station do not significantly impact traffic in the morning since most NNMC traffic is making a left turn from southbound Rockville Pike or a right turn from northbound Rockville Pike. The pedestrian traffic in the afternoon rush period does cause significant impact to this intersection.

Most NNMC traffic exiting the South Wood Road Gate makes a left turn onto Rockville Pike. The traffic study documents that during the peak hour of afternoon traffic for the

Rockville Pike/South Wood Road intersection, only 55 cars make the left turn to go Southbound onto Rockville Pike. As the full cycle for this intersection is 2 minutes 30 seconds for Rockville Pike traffic and 30 seconds for South Drive/South Wood Road Traffic, this shows that there are 20 full cycles within a one-hour period in the afternoon. During each of these cycles, fewer than 3 cars (on average) are able to make the left turn onto southbound Rockville Pike. The primary reason for this low value is that pedestrians crossing Rockville Pike to reach the Medical Center Metrorail station block traffic and prevent vehicles from making the left turn until all pedestrians have crossed. This essentially blocks left turning traffic for the entire 30 seconds – allowing only two or three cars to make the turn before the light cycles again. This low turning rate produces a backup of traffic onto NNMC from the gate to the parking garages.

Field observations show that on average, 30–40 cars are lined up at this gate, waiting to make a left turn onto Rockville Pike. The pedestrian crossings at this intersection are a primary factor in the backup of traffic from the gate to the parking garages. This backup also impacts the ability for emergency vehicles to gain egress from the facility in the afternoon, increasing response time and decreasing the emergency services essential to the function of the hospital.

The traffic study also models an increase in traffic after BRAC is implemented to 97 vehicles making a left turn in the afternoon. Given an increase in Metro ridership, the ability for cars to make the left turn will either not change or worsen after BRAC is implemented.

Specific Roadway Projects Proposed for DAR Approval

Implement traffic improvements at the intersection of Rockville Pike & North Wood Road to include a signal analysis, a new left turning lane for northbound traffic and expanding the storage in the Rockville Pike southbound left turning lane approaching North Wood Rd.

To mitigate the additional BRAC related traffic and to improve traffic flow on Rockville Pike southbound during AM hours three improvements are necessary:

1. Improve left-turning traffic from Northbound Rockville Pike. This improvement can be implemented through the installation of a left-turning lane in the existing median of Rockville Pike. This will provide a turning lane for northbound traffic attempting to make a left turn without impacting the field of vision for left-turning traffic entering the North Wood Road gate. Figure 4 shows that there is adequate space at the existing median to install this left turning lane without impacting the other through lanes.
2. Improve the flow of left-turning traffic from Southbound Rockville Pike. This can be implemented through a new left-turning signal at this intersection. The signal analysis is needed to ensure that the signal can be appropriately timed with adjacent lights to not impact the flow of traffic in the AM or PM rush periods. This coordination will be

implemented by the State of Maryland and the Montgomery County Department of Public Works. This signal will move the entire queue of left-turning traffic into NNMC without impacting the Cedar Lane/Rockville Pike intersection.

3. Improve the storage of left-turning traffic from Southbound Rockville Pike. The additional storage of cars in an expanded left-turning lane will reduce friction on the three southbound lanes. This will move as many cars as possible out of the travel through lanes on Rockville Pike. Field observations show that an additional 100' of storage can be implemented as an expansion of the existing turning lane.

The cost for improvements to the North Wood Road/Rockville Pike Intersection is approximately \$1 million.

Provide a bank of elevators on the east side of Rockville Pike (MD 355) to provide direct pedestrian access to Medical Center Metrorail Station.

This project would provide a new connection between the installation and the existing Medical Center Metrorail Station via a high-speed elevator bank on the east side of Rockville Pike. The county and state transportation agencies and the local planning commission all identify this requirement as an essential part of addressing additional traffic congestion in the region and are strong proponents of this project as a means to manage and promote additional Metrorail use by NNMC employees. WMATA already has preliminary plans in-place for the construction of this improvement. The WMATA proposal is included as Appendix C. The connection would provide numerous benefits to NNMC including:

- Managing increased ridership by providing adequate elevators to handle increased NNMC metro users
- Providing a time savings for pedestrians accessing Metro from NNMC, thereby enhancing transit use
- Providing better mobility-impaired access to the facility by reducing distance, reducing time and eliminating the at-grade crossing of Rockville Pike
- Increasing safety by reducing the pedestrian-vehicle conflicts on Rockville Pike
- Increasing the function of the South Wood Road Gate by reducing the number pedestrian-vehicle conflicts which currently block traffic exiting NNMC to go southbound on Rockville Pike

In total, the project will enhance the mission of NNMC by providing employees, patients and visitors a reliable, safe and accessible alternative to vehicle transit.

1. Increased Ridership

The unique nature of the NNMC BRAC project requires that the facility utilize the mass-transit capabilities of the surrounding transportation network. As additional personnel relocate from Walter Reed Army Medical Center and as existing employees re-evaluate their driving habits in response to limited parking and TMP program incentives, the Metrorail ridership from NNMC will increase significantly. The proposed high-speed bank of elevators will be able to handle the traffic of NNMC metro users and will promote the use of Metrorail by visitors and other users of the facility.

2. Time Savings

As identified above, total travel time between the bottom of the escalators and the NNMC gate ranges from 4 minutes to 6 minutes 30 seconds depending on the traffic signal timing. Once the metro access on the east side of Rockville Pike is operational, commuters will not wait for the elevators as three will be operational. The high-speed elevators move at a much faster speed than the existing elevators, arriving at the street level in less than 20 seconds. Commuters then walk 90 feet to enter the NNMC gates. Total travel time between the station platform and the NNMC gates will be approximately 60 seconds with no waiting time. The total improvement in travel time for pedestrians over current commuters will be up to five and a half minutes per trip. This significant improvement in travel time will provide further incentive for mass transit usage. A significant number of respondents in the mass transit survey identified 'convenience' as a motivating factor for mass transit use.

3. Mobility-Impaired Access

The elevator on the NNMC side will provide mobility-impaired employees and visitors with a reliable, safe, and convenient access between the campus and the Metrorail station. This is contrary to the existing scenario. With the relocation of amputee care and other services which assist mobility-impaired service members, convenient, safe and reliable access to mass transit will be more essential. This access will also benefit the elderly and parents with young children who will have safe access to the facility without the safety concern of crossing Rockville Pike.

4. Increase in Safety

By reducing the number of pedestrians who cross Rockville Pike, the proposed project significantly decreases the number of pedestrian-vehicle conflicts that exist and therefore offers a reduced chance of pedestrian accidents. Based on the values from Table 2, it is estimated that more than 75% of current pedestrian crossings can be eliminated through the use of direct Metrorail access from the east side of Rockville Pike.

5. Increased Function of South Wood Road Gate

The elimination of pedestrians also contributes to the increased function of the intersection. By providing Metro access on the east side of Rockville Pike, a significant number of pedestrian-vehicle conflicts will be reduced and the function of the intersection will dramatically improve in the afternoon rush period. Instead of allowing three vehicles to exit from NNMC during each afternoon light cycle at this intersection, it is estimated that the performance of the intersection for traffic exiting the facility can increase by 300%. This improvement will significantly decrease the queue of traffic backed up on the facility and improve the capability for emergency vehicles to exit the facility and respond to regional emergencies in a timely fashion.

The increased access to the Medical Center Metrorail station not only provides a reliable, safe, and convenient access to mass transit, but also enhances the mission of NNMC and the future WRNMMC by ensuring continuous access to the facility, promoting mass transit use by employees and visitors to the facility, and reducing the impact of the facility's operation on the surrounding community. The proposed Metrorail bank of elevators could also provide the facility with an emergency evacuation route for patients, visitors and employees to access the Metrorail station without impacting Rockville Pike, which is a major evacuation route from Bethesda and Washington, DC.

The cost for the installation of a bank of high-speed elevators on the east side of Rockville Pike is approximately \$20 million.

Conclusion

The local and state transportation agencies concur with the recommended roadway improvements. Although jurisdiction remains with the local and state agencies, these agencies have expressed their inability to provide adequate funding in a timely fashion to address the additional traffic caused by the BRAC action before implementation in 2011. As a result, they have specifically requested assistance from the DoD through the DAR Program.

While the improvements suggested would provide benefit to the function of the surrounding roadway network, addressing the long-term congestion of the local roadway network remains the responsibility of the local and state transportation agencies. In response to these regional transportation issues, the State of Maryland has programmed approximately \$45 million over the next 4 years to implement road improvement projects in the area of NNMC Bethesda. The four intersections under consideration by the State of Maryland for improvements include the four intersections which are currently at or beyond the failing condition (Rockville Pike/West Cedar Lane; Rockville Pike/Jones Bridge Road; Jones Bridge Road/Connecticut Avenue; West Cedar Lane/Old Georgetown Road).

It has been shown that the proposed BRAC Bethesda action constitutes an unusual impact on the transportation network surrounding NNMC. It has been further shown that the traditional measures for an unusual impact do not correlate in the environment

surrounding NNMC and therefore should be modified to evaluate the increase in traffic impacts rather than an increase in traffic volume. Furthermore, the consideration of a mass transit project is warranted for NNMC due to the significant portion of NNMC employees utilizing mass transit, and the probable increases in mass transit use that will result from the BRAC action.

The improvements recommended in this report would alleviate the defense-generated impacts to the local transportation network by addressing the Department of Defense's share in the local traffic congestion caused by the unusual nature of this BRAC action.

Appendix A: Traffic Study from Final Environmental Impact Statement

Appendix B: NNMC Employee Survey on Transportation

Appendix C: WMATA Proposal for Connection to Medical Center Metrorail Station