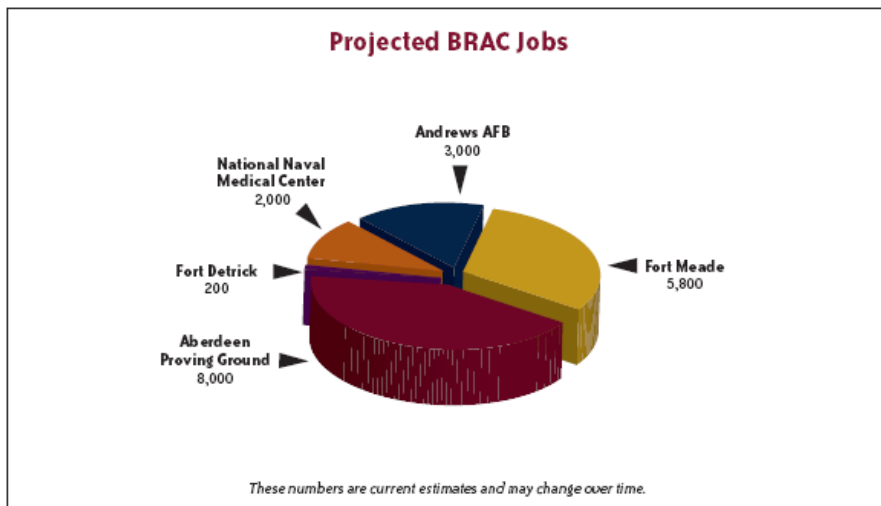


An Assessment of the Base Realignment and Closure Activities on AA/DEIS Travel Assumptions for the Purple Line

Introduction - This report documents the changes to employment associated with Base Realignment and Closure (BRAC) activities at Bethesda Naval Hospital relative to the population and employment forecasts used in the AA/DEIS documents for the Purple Line AA/DEIS. This assessment includes an examination of the total employment changes in the Bethesda / Naval Hospital area, the expected origin location and travel patterns of work trips, and the potential effects on the usage of Purple Line alternatives and the potential effects of the BRAC vehicular traffic increase on the performance of the Purple Line alternatives, specifically the BRT Low Investment Alternative which would operate on Jones Bridge Road/Wisconsin Avenue and adjacent to the National Naval Medical Center (NNMC) in Bethesda..

BRAC Proposal for Bethesda Naval Hospital

Maryland is expecting an influx of 20,000 jobs statewide as a result of latest proposed BRAC plans. The graphic below depicts the distribution of jobs for various facilities in Maryland.



Source: MDOT

As a result of BRAC, some of the existing functions of the Walter Reed Army Medical Center (WRAMC) in Washington DC will be transferred to the National Naval Medical Center in Bethesda, while other functions at Walter Reed will be transferred to Fort Belvoir in northern Virginia. The combined Bethesda facility – to be called the Walter Reed National Military Medical Center (WRNMMC) - will be the regional facility for both inpatient and outpatient care for both active and retired military personnel and a specialty center for severely injured military personnel. The military is combining the functioning of its Medical College complex located at the Bethesda facility with patient care to better integrate medical education and care functions at one location.

Planning and design is underway for the additional infrastructure at the facility needed at the WRNMMC, including additional medical facilities to support inpatient and outpatient services, additional lodging, a fitness facility and a new parking garage. There will be family quarters built to house families of service members who are working through the programs.

The BRAC legislation has identified a date of September 15, 2011 as the date for completion of the merger process and closure of the WRAMC. It is expected that by that time 2,200 additional staff members and an estimated 1,860 daily visitors will be added to the Bethesda campus. Of the 2,200, approximately 1,750¹ are expected to transfer from Walter Reed with the remaining 450 to be new staff to be added for maintenance and support.

One of the primary functions of the new facility will be to care for seriously injured service members with facilities to be added for traumatic brain injury, post traumatic stress disorder and aftercare spaces for those recovering from in-patient services. Air Force, Navy, and Army functions for these services will all be combined into one facility.

The 2005 estimated employment level at the NNMC facility was estimated at approximately 8,100 workers. The expected increase of 2,200 workers would bring the total to 10,300; representing a 27% increase over current employment levels at the facility.

Expected trip generation and travel patterns

The NNMC DEIS contains information on the expected travel impacts to the surrounding road network associated with the increase in jobs at the combined facility. The analysis uses a transit mode split of 15% and the addition of 2,500 jobs. 2,500 jobs were used as a “worst case” scenario typical of traffic impact analysis.

Based the analysis, the impact of the shifting employment and visitor increases at the new facility is expected to generate approximately 860 additional trips into and out of the facility in the AM peak and approximately 910 additional trips into and out of the facility in the PM peak. The AM and PM peak hours for NNMC traffic were noted as being 6:30-7:30 AM and 4:15-5:15 PM. The AM and PM peak hours for the background traffic were noted as being 7:45–8:45 AM and 5:00–6:00 PM.

These trips were distributed geographically and temporally for this analysis based on current percentages of traffic traveling into and out of the gates and then analyzed for impacts to the surrounding road network.

Travel in the Bethesda / NNMC area will be affected by the increase in traffic associated with the increase in trips to the new WRNMMC. Peak hour volume increases were presented in the DEIS, based on the analysis noted above. The change in peak hour volumes attributable to base traffic includes:

¹ BRAC Program Manager - NNMC

- A 3% increase to the intersection at Rockville Pike and West Cedar in the AM peak
- A 7% increase to the intersection at Rockville Pike and North Drive in the AM peak
- A 3% increase to the intersection at Rockville Pike and Jones Bridge Road in the PM peak
- A 4% increase to the intersection at Jones Bridge Road and Connecticut Avenue in the PM peak

Trips beyond the immediate study area and to the surrounding areas were also noted. The traffic generated is expected to add:

- 21 trips in the peak hour at the Jones Mill Road and East West Highway interchange (an increase of 2%) for the AM peak
- 39 trips in the peak hour (for the analysis lane) at Jones Mill Road and East West Highway (an increase of 3%) for the PM peak.

Planned Improvements

BRAC legislation does not allow the commitment of funds to improve facilities beyond the borders of the bases themselves. Therefore Maryland Department of Transportation and Montgomery County have begun to assess impacts and determine the scope and timing of improvements in the base area. There have been a number of initiatives put in place. Some of these include:

- A study of improvements to the entry/exit gates (design and operations) at the combined facility
- An assessment of the potential of widening Rockville Pike along the WRNMMC frontage to accommodate widening of the roadway
- A study of improving the Metro station access
- Intersection improvements in areas noted as providing poor or degraded levels of service

The most recent State of Maryland Consolidated Transportation Program (CTP) includes the funding for the following project or initiatives:

Transit

- \$201 million for the MARC Growth and Investment Plan
 - \$52 million for new MARC passenger coaches
 - \$125 million for MARC Penn Line improvements
 - \$17 million for MARC Camden Line improvements
- \$20 million for Commuter Bus Program
- \$9.0 million for Assessment of Transit Needs for BRAC
- \$6.8 million to Locally Operated Transit Systems

Specific to the NNMC the CTP includes:

Improvements Specific to National Naval Medical Center

- \$44.8 million in high priority intersection improvements; currently evaluating:
 - MD 355 @ West Cedar Lane
 - MD 355 @ Jones Bridge Road
 - MD 187 @ West Cedar Lane
 - MD 185 @ Jones Bridge Road
- Additional \$100 million for Purple Line Engineering and Design
- \$5 million for support of Ride-On for bus replacements

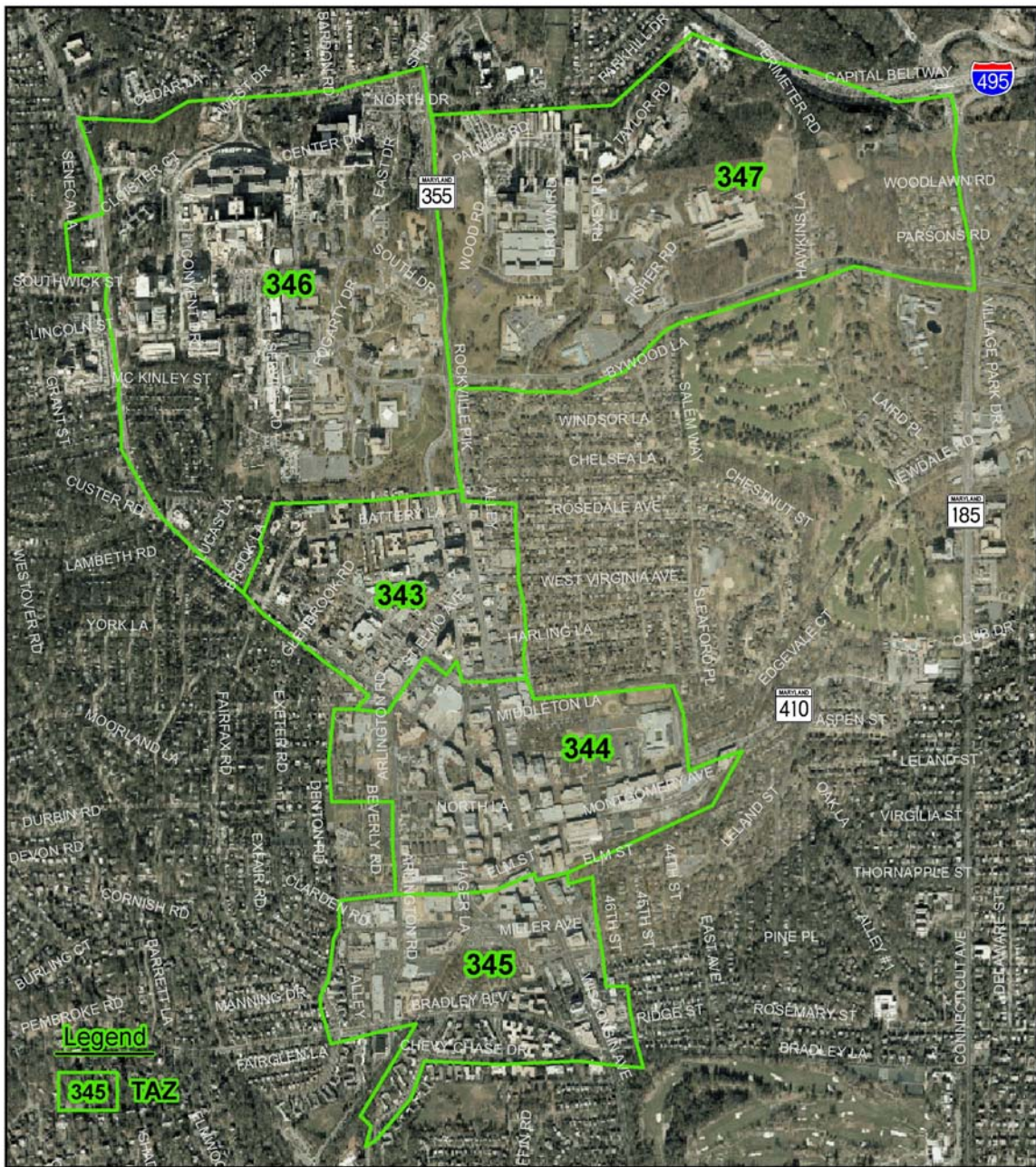
The findings from these studies and the timing for implementation of any associated improvements will not be available for review for some time.

Population and Employment Changes in the Study Area

Population and employment in the NNMC study area is expected to increase as a result of organic growth (non-BRAC related) in addition to the BRAC changes.

The Metropolitan Washington Council of Governments (MWCOG) released its most recent land use forecasts the Round 7.1 forecast which identifies expected future population and employment in the Medical Center / Bethesda CBD area. Figure 2 below identifies the expected land use growth for traffic analysis zones in the area as identified in this process. Zone 347 as shown below contains the NNMC/WRNMMC facility. For the entire Bethesda area population is expected to increase by 13,108 to 2030 and employment is expected to increase by 11,598 to 2030.

Figure 2- Population and Employment - Bethesda CBD and NNMC



Population & Employment Growth

Expected Population & Employment Growth - 2005 to 2030 [Bethesda / NIH / NNML]

TAZ	2005TOTPOP	2005TOTEMP	2030TOTPOP	2030TOTEMP	PERCENT CHANGE IN POPULATION	PERCENT CHANGE IN EMPLOYMENT
343	3634	7202	9328	7897	156.7%	9.7%
344	3895	19572	8128	22558	108.7%	15.3%
345	2968	8996	5479	10386	84.6%	15.5%
346	828	18053	965	22080	16.5%	22.3%
347	813	8142	1346	10642	65.6%	30.7%



Source: MWCOG Round 7.1 Forecasts

Land Use Assumptions – Purple Line AA/DEIS

The table below compares the land use changes used in the Purple Line AA/DEIS and the most recent MWCOG forecast. The Purple Line AA/DEIS used the MWCOG Round 7.0 forecasts and later updates will use the Round 7.1 forecasts. As noted, the WRNMCC addition of 2,200 jobs is a partial contributor to the overall job increase of 4500 jobs (Round 7.0) or over 6,000 jobs (Round 7.1) forecasted at the NNMC area to the year 2030 with additional organic growth expected at NIH and WRNMCC combined. Residential growth is expected to be only in the 500 to 700 range. In contrast, the Bethesda CBD area is expected to show larger increases in population and employment adding an additional 12,000+ residences and 5,000 jobs.

Table 1 - Aggregate Growth for Bethesda CBD and NIH/WRNMCC

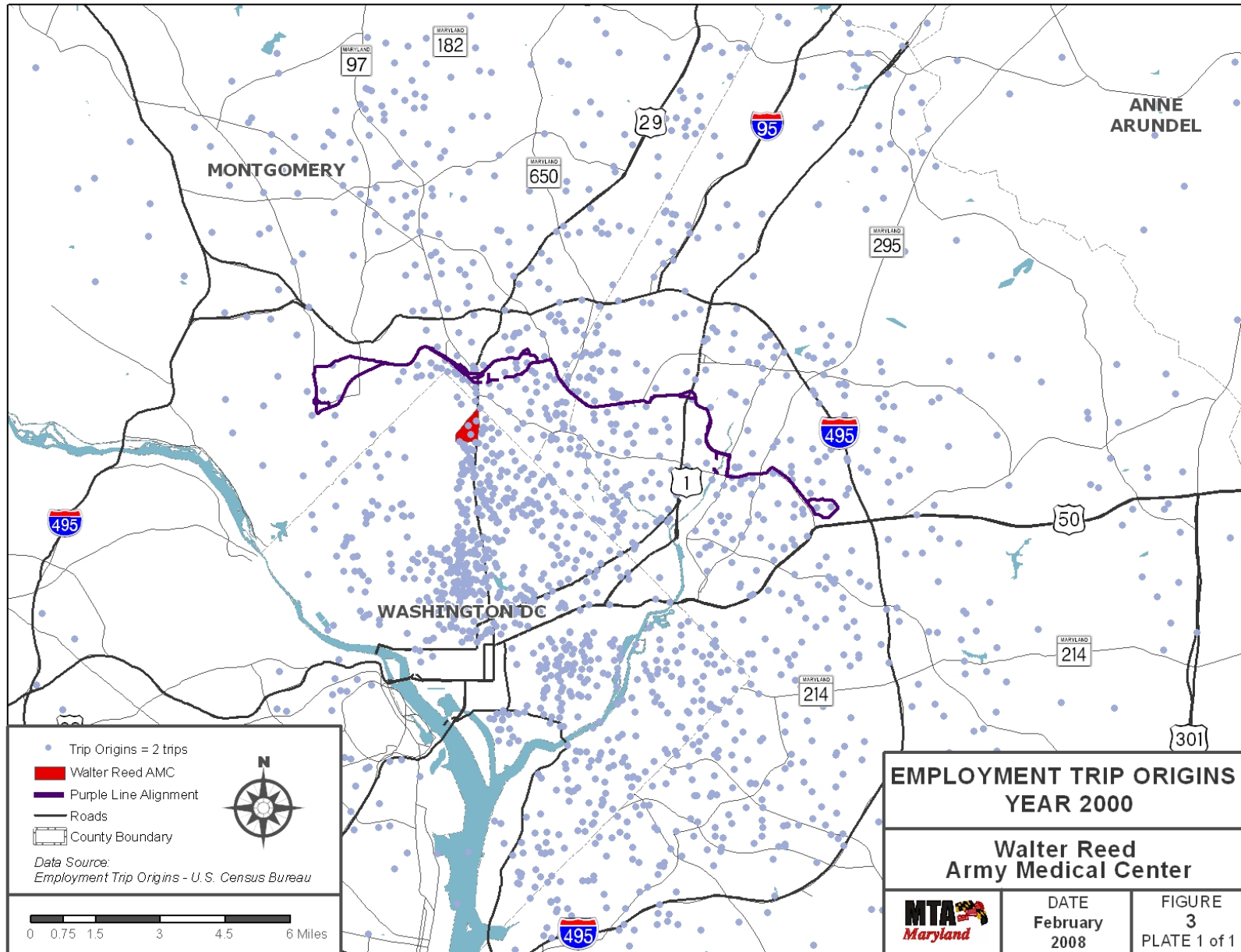
	2005 TOT POP	2030 TOT POP	% Change	2005 TOT EMP	2030 TOT EMP	% Change
Bethesda						
Round 7.0	11446	23184	103%	34833	41567	19%
Round 7.1	10497	22935	118%	35770	40841	14%
NIH/NNMC						
Round 7.0	1222	1762	44%	23801	28302	19%
Round 7.1	1641	2311	41%	26195	32722	25%

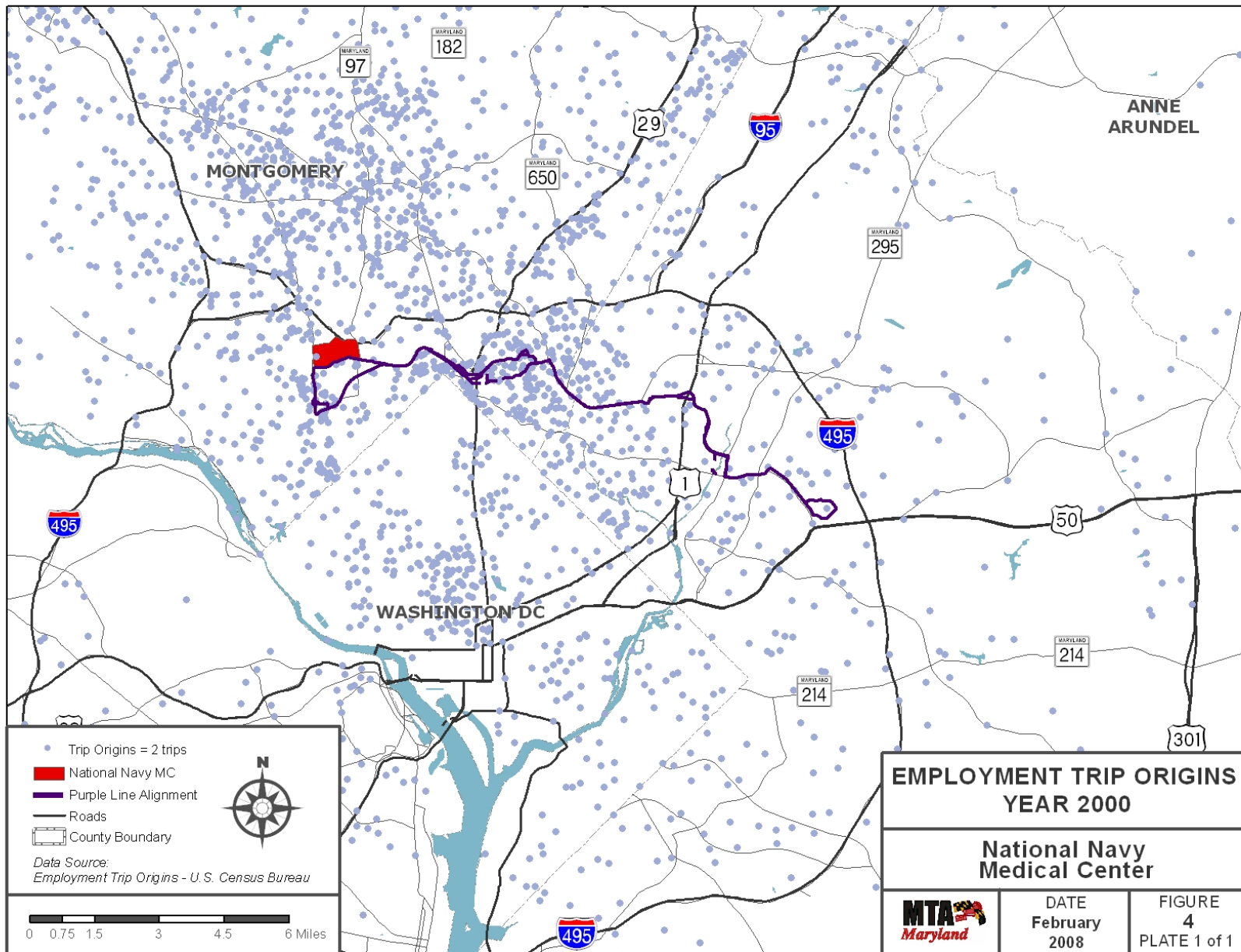
Overall, with the exception of the employment levels at NNMC, the changes in land use projections between Rounds 7.0 and 7.1 are comparable.

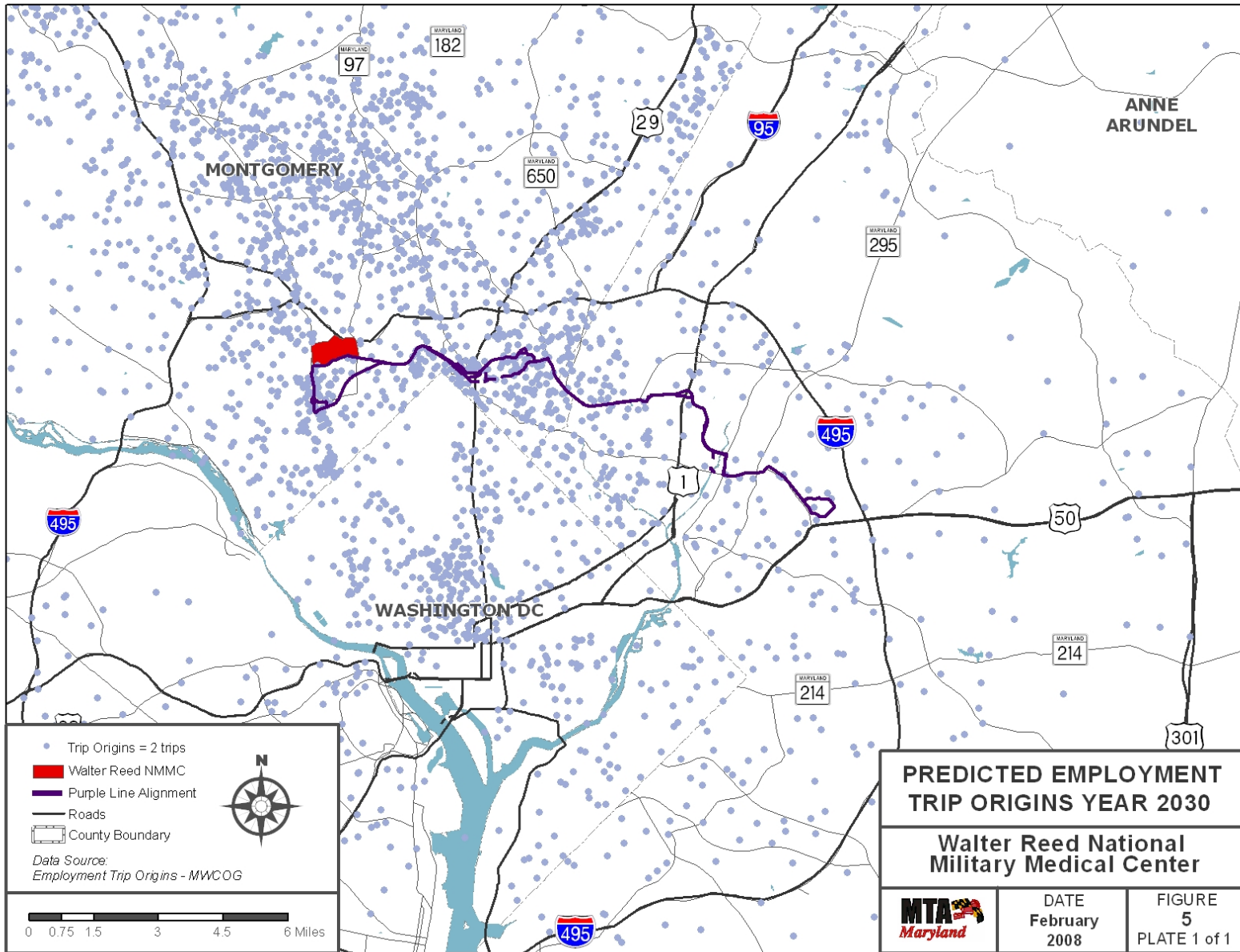
BRAC employment growth at Bethesda Naval Hospital

Walter Reed Army Medical Center in northeastern Washington, D.C. currently has approximately 6,000 workers. Of those, approximately 1,750 are expected to be transferred to the new facility in Bethesda. The remaining 450 associated with BRAC will be added to support ongoing efforts at the base.

In order to assess the potential effects of these employment shifts on the Purple Line ridership analysis, the home locations for workers currently working at Walter Reed were identified and their home location compared to the Purple Line service area. The next three figures show the existing employee trip origins for travel to the Walter Reed facility (assuming travel originates from the home location), existing trip origins to the NNMC complex and the predicted trip origins to the new combined facility for the year 2030.







Based on this analysis, approximately 650 Walter Reed employees currently live within the Purple Line service area. With the NNMC DEIS figure that approximately 30% of these employees will be transferred as part of the BRAC changes (1,750 out of 6,000), a total customer market of approximately 200 customers would be added to the peak hour (employment) trips to and from the new WRNMCC on a daily basis. Using a 30% transit mode share, approximately 60 current Walter Reed employees would use transit and some portion of these employees would potentially use the Purple Line transit service for travel to the WRNMCC in the peak hour. This trip could either be by way of the Master Plan alignment to Bethesda with a transfer to the Metrorail Red Line to the Medical Center Station or, in the one case of the BRT Low Investment Alternative, a route along Jones Bridge Road although the station would be on Wisconsin Avenue (Rockville Pike) just south of Jones Bridge Road. Under all the alternatives, existing bus services from Silver Spring Metro Station/Transit Center to the WRNMCC area would still be available.

Travel Times

The Purple Line alternatives have their western termini at Bethesda at the Bethesda Metrorail Station. One alternative, BRT Low Investment, would operate on Jones Bridge Road, which borders the WRNMCC site along its southern edge. The station for the service would be on Wisconsin Avenue (Rockville Pike) south of the Jones Bridge Road intersection, twelve hundred feet south of the Medical Center Station that is located close to the security control entrance to the WRNMCC. Based on the operations plan for the Purple Line travel times from the Silver Spring Metrorail Station to Bethesda Metrorail Station and Medical Center Metrorail Station were derived given future traffic conditions. Travel times between Silver Spring station and the tunnel entrance to NNMC on Rockville Pike were calculated for comparison. Table 2 below identifies the results of this analysis

Table 2 - Travel Time Analysis - Silver Spring to WRNMMC and Bethesda CBD

Silver Spring to Medical Center		Silver Spring to Bethesda CBD	
Alternative	Travel Time	Alternative	Travel Time
Low BRT	24.8	Low BRT	24.5
Med BRT	20.6	Med BRT	13.1
High BRT	20.6	High BRT	13.1
Low LRT	18.7	Low LRT	11.2
Med LRT	16.3	Med LRT	8.8
High LRT	16.3	High LRT	8.8

Assumptions:

- Trip times calculated - Silver Spring Metro Station to tunnel / entrance to NNMC on Rockville Pike

At Bethesda Station:

- 2 minute walk time - platform to platform
- 3 minute travel time Bethesda - Medical Center (WMATA)
- 2.5 minute transfer delay at Bethesda station (WMATA)

At Medical Center BRT stop:

- 5 minute walk time - Medical Center BRT station to pedestrian tunnel at entrance to NNMC

As a comparison it is estimated that TSM alternative improvements for transit connections between Silver Spring and Bethesda would yield transit service improvements that would allow for a 32 minute trip by bus between Bethesda Center and Silver Spring. A similar analysis for travel between Silver Spring and Medical Center identifies an expected future transit travel time (via bus) of over 35 minutes.

Traffic in the Bethesda/NIH/WRNMCC Area

The potential increase in employment at the combined medical facility could be expected to worsen conditions along this roadway and could affect travel time for the Low Investment BRT alternative.

As part of the Purple Line AA/DEIS, a peak hour traffic operations analysis was conducted for the signalized intersections along the study corridor. Using 2005 field collected traffic counts as the base, peak hour projections were developed for the year 2030 based on an average annual growth rate of 1 percent per year over the 25-year period. In other words, the Purple Line traffic projections assume that during the peak hours, traffic will increase by approximately 25 percent over 2005 levels. The methodology used to determine this growth rate, which was based on the change in trips in the study area TAZs and an analysis of several key volume screenlines, was coordinated with the Maryland State Highway Administration, who concurred with the approach. It is important to note that while an average growth rate of 1 percent per year was assumed, traffic growth does not have to be linear. A specific major event, such as the expansion at NNMC, could result in faster growth during a short period, while the

total growth over the 25-year horizon would be expected to represent an average increase of 1 percent per year.

In comparison, the NNMC DEIS developed Year 2011 peak hour traffic projections based on standard traffic impact study procedures. These 2011 peak hour traffic projections included both the NNMC expansion and new trips associated with 11 proposed nearby developments. A comparison of the Year 2011 peak hour traffic projections to the existing traffic volumes at several key intersections along Jones Bridge Road indicate increases in the total peak hour traffic by 2011 of 5 to 10 percent. This equates to an average annual growth rate of between 1 and 2 percent. In applying an average annual growth rate of 1 percent per year, the Purple Line traffic projections accommodate the growth in peak hour traffic expected due to BRAC and allow for increased growth in traffic of approximately 15 percent between 2011 and 2030.

It was therefore concluded that the assumptions built into the Purple Line traffic analysis were conservative enough to reflect expected 2030 traffic conditions within a reasonable variance percentage. Travel time analysis was conducted for conditions noted in the Purple Line analysis. Further travel delay was not added the Purple Line traffic analysis or the Low Investment BRT alternative operations plan to reflect the impact of BRAC as the Purple Line analysis included a sufficient level of growth to reflect the effects.

Analysis Findings

The analysis conducted for this study point to a few conclusions:

- Notwithstanding the growth in BRAC employment and organic growth in the NNMC area, the amount of growth forecasted for the Bethesda area is much higher. Downtown Bethesda remains a much larger travel market for a direct Purple Line transit service than the NNMC area.
- The impacts of BRAC implementation employment and activity growth in the Bethesda area will have a nominal affect on Purple Line transit ridership and traffic conditions in the area around the combined WRNMMC facility.
- The total impact of BRAC growth on potential Purple Line transit ridership is limited when evaluating existing home locations for WRAMC employees.
- Transit travel time to NNMC from Silver Spring and points east are comparable if not faster using the Purple Line alternatives operating along the Master Plan alignment to Bethesda and connecting to the Metrorail Red Line to Medical Center than transit service on Jones Bridge Road.
- Additional travel time delays to the Bethesda CBD as a result of the BRAC traffic increases would adversely affect the operation of the BRT Low Investment alternative, if it were chosen over other options.