THE MARYLAND-NATIONAL CAPITAL PARK AND PLANNING COMMISSION
8787 Georgia Avenue • Silver Spring, Maryland 20910-3760

MCPB
Item No. 5
4-8-04

April 2, 2004

MEMORANDUM

TO: Montgomery County Planning Board

VIA: John Carter, Chief
Community-Based Planning Division

Jeffrey Zyontz, Chief
Countywide Planning Division

FROM: Daniel K. Hardy, Transportation Supervisor (301-495-4530) DKH
Transportation Planning
Countywide Planning Division

SUBJECT: Bethesda CBD Staging

Recommendation: Approval to Proceed to Stage II, Conditional Upon the Establishment of a Stage II Ceiling of 5,000 Jobs Without a Ceiling for Housing

This memorandum summarizes staff recommendation to proceed to Stage II in the Bethesda Central Business District (CBD). The 1994 Bethesda CBD Sector Plan recommends implementing six objectives during the near term, also described as Stage I. This memorandum describes how **all six of those objectives have been met so that the CBD is ready to move to Stage II.** The Planning Board is asked to endorse the staff recommendation on Bethesda CBD staging and inform the County Council of their decision.

One of the six staging plan objectives is to complete an analysis of traffic congestion to identify plans and programs that may be needed during Stage II. This analysis is described as a Comprehensive Local Area Transportation Review (CLATR). At most intersections examined in the CLATR, geometric improvements are considered that would be consistent with the guidance in the current master plans for the Bethesda CBD and Bethesda / Chevy Chase. The CLATR indicates that policies and programs described in the Bethesda CBD Sector Plan are sufficient to accommodate projected Stage II development within the CBD. At three intersections outside the CBD, however, traffic congestion already exceeds current policy thresholds and planned policies and programs do not effectively relieve the existing or forecasted congestion at those three locations.

Staff therefore recommends a conditional approval to move to Stage II in the Bethesda CBD. The 1994 Sector Plan limited Stage I development to 5,000 jobs above the 1993 level and indicated that long-term growth would add another 11,400 jobs to the Stage I total. Staff now recommends a similar approach, **limiting Stage II development to 5,000 jobs above the current levels of commercial development already approved**. Staff recommends no Stage II limit to housing in the Bethesda CBD. Additional details regarding the transportation analysis and findings are described within the portion of this memorandum that addresses the CLATR.

The Sector Plan language regarding staging references the use of the Annual Growth Policy (AGP) as a tool to increase staging ceilings several times during Stage II. Council staff advises that while the FY 05 AGP will eliminate Policy Area Transportation Review, the staging elements of master plans remain valid. Should the Planning Board approve the staff recommendation, staff would establish an independent tracking system for subsequent Stage II job approvals (with a current level of zero and a Stage II cap of 5,000) in the Bethesda CBD effective immediately.

SECTOR PLAN GUIDANCE

The 1994 Bethesda CBD Sector Plan recommends that six objectives be completed prior to entering Stage II. These objectives are described in Table 10.2 of the Plan, included as Attachment A on pages Circle 1 through Circle 3, and summarized below:

1. Reach Stage I ceiling capacity
2. Establish Transportation Management Organization
3. Maintain a constrained long-term parking policy
4. Increase non-auto-driver mode share for employees to 32 percent
5. Program transportation facilities recommended during Stage I
6. Complete an analysis of traffic congestion and transportation management program effectiveness to demonstrate that the new areawide transportation level of service meets an acceptable AGP standard. This analysis is called the Comprehensive Local Area Transportation Review.

The following portions of this memorandum describe how each of these objectives has been satisfied to date.

OBJECTIVE 1: REACH STAGE I CEILING CAPACITY

The 1994 Bethesda CBD Sector Plan recommends the establishment of a staging ceiling in the AGP of approximately 5,000 jobs above 1993 levels. The staging ceilings for both jobs and housing in the Bethesda CBD have subsequently been monitored through the AGP process. In the FY 95 AGP, the first AGP after the Sector Plan approval, the Bethesda CBD had a remaining capacity of 5,305 jobs and 3,200 housing units. As of February 29, 2004, the remaining capacity is 706 jobs and 33 housing units.

The AGP provides some flexibility to allow remaining capacity to be transferred from housing units to jobs. Because the remaining capacity for housing units is approaching zero, **staff finds that the Stage I ceiling capacity has effectively been reached.**

OBJECTIVE 2: ESTABLISH A TRANSPORTATION MANAGEMENT ORGANIZATION

Bethesda Transportation Solutions is the Transportation Management Organization (TMO) for the Bethesda CBD and has been in operation for nearly five years. The Bethesda Transportation Management District (TMD) was adopted into legislation on February 23, 1999 with County Council Resolution Number 14-56. On December 20, 1999 a contract was signed between Montgomery County, Maryland and the Bethesda Urban Partnership, Inc. to create Bethesda Transportation Solutions.

OBJECTIVE 3: MAINTAIN A CONSTRAINED LONG-TERM PARKING POLICY

The Bethesda CBD Sector Plan recommends constraining the number of long-term parking spaces available to CBD employees. The Sector Plan forecasts the need for an additional 8,750 parking spaces above 1992 levels, of which 4,800 would likely be public parking spaces. For private parking facilities, the constrained long-term parking policy has been implemented through the Planning Board's development review process.

In the public realm, two parking lots have been converted to garages since the early 1990s. The conversion of Lot 36 (Auburn-Del Ray Garage) and Lot 42 (Cheltenham Garage) has resulted in a net increase of approximately 900 parking spaces in the CBD. The implementation of planned public parking spaces is proceeding at a slower rate than the increase in commercial employment. **Therefore staff finds that the constrained long-term parking policy is being followed.**

OBJECTIVE 4: INCREASE NON-AUTO DRIVER MODE SHARE (NADMS) FOR EMPLOYEES TO 32 PERCENT

The 1994 Bethesda CBD Sector Plan recommends robust Travel Demand Management (TDM) activities as key elements in managing traffic congestion. TDM activities described in the Sector Plan include the establishment of the Transportation Management Organization (TMO) and the maintenance of the constrained long-range parking policy. The staging plan recommends evaluation of TDM performance in part by monitoring the mode share of Bethesda CBD employees with the objective of reducing the percentage of employees who drive to work. In other words, the goal is to increase the "non-auto driver mode share" (NADMS).

The Sector Plan establishes the following NADMS goals:

- 27% observed in the early 1990s
- 32% goal at the end of Stage I
- 37% goal at the end of Stage II

The NADMS has historically been measured by annual workplace surveys of CBD employees. The Montgomery County Department of Public Works and Transportation (DPWT) conducted these surveys in the early 1990s. The surveys were not performed during the late 1990s as both public and private sectors pursued implementation under the initial Sector Plan guidance for Stage I. After the establishment of the TMO, Bethesda Transportation Solutions has performed the annual survey using the same procedures as followed during the early 1990s.

Exhibit 1 compares the NAMDS obtained from the surveys performed since 1993. In the five surveys conducted between 1993 and 2001, the NADMS ranged from 24% to 27%, below the Stage I goal. **In the last two surveys, conducted in 2002 and 2003 the NADMS was 34%, above the Stage I goal.**

Exhibit 1. Bethesda CBD Employee Mode Share

Year	Non-Auto Driver Mode Share
1993	27%
1994	24%
1995	27%
2000	27%
2001	26%
2002	34%
2003	34%

Several factors contribute to the observed change in NADMS. In general, these factors can be considered part of the maturation of the Bethesda CBD. Specifically, the factors include changes in land use, economic conditions, public programs, and other related travel behaviors, as summarized below:

- Approximately 1.3 million square feet of commercial development within two blocks of the Metrorail station was made available for occupancy between 2001 and 2003, including Chevy Chase Bank, Newlands Building, and Bethesda Place II. Prior studies have shown that proximity to the Metrorail station is a key variable in increasing transit mode share for office employees.
- In part due to the new office buildings near the Metrorail station, the amount of occupied Class A office space in the Bethesda CBD increased by 400,000 square feet between the second quarter of 2001 and the second quarter of 2003. In the same timeframe, however, the amount of occupied Class B and Class C office space in the CBD, generally located further away from the Metrorail station, decreased by 328,000 square feet.
- Parking rates in the Bethesda Parking Lot District were raised in 2001 with long-term spaces increased from $0.40 to $0.50 per hour or from $75 to $85 per month.
- The proportion of survey respondents reporting that their employers cover all costs of employee parking has dropped from 49% in 2000 to 28% in 2002.

- Bethesda Transportation Solutions has provided consistent and continuing programs and services to assist employers to develop effective transportation management plans and provide commute option information to CBD employees.

The use of the commuter survey as a tool to assess Sector Plan mode share goals has been controversial. In particular, the approach has been critiqued because the sampling process is not random (so that a statistical "margin of error" for the NADMS is not available). In addition, other readily available data sources such as peak period traffic volume and transit utilization counts have remained essentially constant during the past few years, so they do not provide corroborative evidence that transit trips are increasing or vehicle trips are decreasing. Such evidence is frankly not expected, however, due to the fact that traffic and transit rider counts are complicated by many factors (including the previously described changes in commercial space availability and occupancy, the lack of trip destination or purpose information, and the elasticity inherent in traveler behavior) that would mask even a 7% change in mode share. In early 2001, the County Council considered several alternative means for establishing the Sector Plan mode share and determined that the annual commuter survey remained the most cost-effective. One of the strongest arguments in favor of utilizing the commuter survey is that it retains the methodology upon which the Sector Plan goals are based.

OBJECTIVE 5: PROGRAM TRANSPORTATION FACILITIES RECOMMENDED DURING STAGE I

The Sector Plan recommends several transportation facilities that should be provided during Stage I. These facilities are identified in Table 10.2 of the Sector Plan (included as Attachment A). The Sector Plan recommends that these facilities can be defined as "provided" through either inclusion in the County's Capital Improvements Program (CIP) or implemented through development projects.

The recommended Stage I transportation facilities can be grouped into four categories:

- Implemented
- Included in the County CIP
- Included in the Maryland Department of Transportation (MDOT) Consolidated Transportation Program (CTP)
- Not triggered at this time based on staging conditions

The County Executive has established two CIP projects to complete the transportation facilities (Project No. 500119) and streetscaping (Project No. 500102) recommended for Stage I. A third CIP project (No. 500140) will improve the intersection of Wisconsin Avenue (MD 355) and Jones Bridge Road. This intersection improvement project is not directly related to the CBD staging plan, as its need is independent of growth at the National Institutes of Health (NIH) as indicated in the staging plan. All three of these projects are already included in the FY03-08 budget approved by the County Council. The Project Description Forms (PDF) for these projects as included in the Executive's Recommended FY 05 CIP are included in Attachment B on pages Circle 4 through Circle 9.

Exhibit 2 summarizes the implementation status of these recommended facilities.

Exhibit 2. Status of Recommended Stage I Transportation Facilities

Item	Facilities	Status
1	Bicycle network Route A2	Included in CIP Project No. 500119
2	Bicycle network Route C	Included in CIP Project No. 500119
3	Pedestrian system improvements at four locations	Portions implemented; remaining locations included in CIP Project No. 500119
4	Streetscape improvements in the Metro Core District	Included in CIP Project No. 500102
5	Bicycle network Route H	Included in CIP Project No. 500119
6	Streetscape improvements along northern Wisconsin Avenue	Portions implemented; remaining locations included in CIP Project No. 500102
7	Other bicycle network routes	Portions implemented, remaining locations included in CIP Project No. 500119
8	Intersection improvement at Connecticut Avenue and East-West Highway	Included in MDOT CTP
9	Intersection improvements on Rockville Pike at Cedar Lane and Jones Bridge Road if significant growth occurs at NIH	Not triggered at this time as NIH traffic volumes remain below levels established in the 1992 MOU between NIH, NCPC, and M-NCPPC. Unrelated improvement at Jones Bridge Road in CIP Project No. 500140

Several private development projects have completed streetscape improvements called for in the Sector Plan. The Residences at Rosedale Housing development, the CVS Drug Store, a Shell service station, and the Sheraton Hotel have completed significant portions of the streetscape along Wisconsin Avenue toward the northern CBD gateway. The future Woodmont Corner development will provide streetscape and utility undergrounding on Woodmont Avenue between Old Georgetown Road and Cheltenham Drive and along Old Georgetown Road between Woodmont and Fairmont Avenues. The CIP projects described in Exhibit 2 are intended to fill in the gaps along Wisconsin and Woodmont Avenues.

One concern associated with the CIP streetscaping project is that the cost for implementing the facilities is likely to exceed the current $3.6M budget. DPWT is currently completing the preliminary engineering work needed to develop more precise cost estimates. These estimates will be discussed during County Council budget worksessions this spring. Staff recognizes that the amount of money available in the CIP will not cover the costs of completing all the

streetscape elements including trees, lights, brick paving and undergrounding of utilities. Private sector funds, augmented by the CIP, will provide enough streetscape to enhance the existing sidewalks and the pedestrian connections to the Metrorail station along these important streets as required in the staging plan.

OBJECTIVE 6: COMPLETE COMPREHENSIVE LOCAL AREA TRANSPORTATION REVIEW

A Comprehensive Local Area Transportation Review is a tool to analyze the effects of likely development projects in the CBD considering both a geographic coverage and a temporal range beyond that associated with the Local Area Transportation Review performed at time of subdivision. The second page of Table 10.2 (Page Circle 2 of Attachment A) describes two primary purposes for the CLATR:

- Stage II can begin when the transportation analysis indicates that the areawide transportation level of service meets an acceptable AGP standard, and
- Intersection improvements likely to be required during Stage II will be identified as a result of the CLATR.

The transportation analyses performed indicate that:

- The existing and forecasted areawide transportation level of service meets an acceptable AGP standard. **This finding contributes to the staff recommendation that the Bethesda CBD move to Stage II.**
- Reasonable travel demand management objectives and intersection improvements can be implemented to achieve Stage II development except at three locations in the Bethesda / Chevy Chase Policy Area (Wisconsin Avenue at Jones Bridge Road, Connecticut Avenue at Jones Bridge Road, and Connecticut Avenue at East-West Highway). At all three locations:
  - Both current and forecast congestion levels exceed applicable standards
  - At-grade capacity improvements have recently been studied in detail
  - The forecasted congestion cannot be resolved to satisfy current congestion standards by merely improving CBD mode share goals or by adding auxiliary turn lanes
  - Further study would be needed to assess the feasibility or desirability of grade-separated interchanges
  - A master plan amendment would be needed to resolve forecasted congestion by either changing land use, mode share goals, the number of through travel lanes on selected area roadways, or recommending grade-separated interchanges

The unresolved concerns regarding congestion at three intersections in the Bethesda / Chevy Chase policy area are the basis for the staff recommendation that a new ceiling of 5,000 jobs be established for Stage II.

Staff does not propose establishing a Stage II ceiling for households because vehicle trips generated by housing in the Bethesda CBD tends to generate primarily off-peak direction travel at the three intersections of concern. These intersections are located north or east of the CBD.

The prevailing commuter flows at these locations that contribute to congestion are southbound and westbound during the morning peak period and northbound and eastbound during the evening peak period. These prevailing flows are substantially affected by the general regional flow of traffic between residential trip productions to the north and commercial trip attractions to the south. Therefore, jobs in the CBD (south or west of the intersections) contribute significantly to the prevailing commuter flow at these intersections north and east of the CBD. Housing units in the CBD, however, do not contribute significantly to prevailing commuter flows at these intersections north and east of the CBD.

The recommendation that the job ceiling be established at 5,000 jobs, as opposed to a different number of jobs, is a matter of professional judgment. A technical basis for the ceiling would be desirable, such as the number of jobs at which point the intersections would pass a congestion threshold. However, these two intersections are forecasted to be above their congestion standard regardless of the level of additional development assumed in the CBD. Staff therefore suggests that the 5,000 job ceiling is appropriate because it:

- Represents roughly half of the Stage II commercial development envisioned in the 1994 Sector Plan
- Matches the 5,000 job level recommended in the Sector Plan as a reasonable Stage I allowance
- Provides a sufficient level of job capacity to accommodate forecasted demand during the next several years after which time comprehensive master plan updates for both the Bethesda CBD and the Bethesda / Chevy Chase plan areas should be scheduled.

The remaining paragraphs provide additional details on the CLATR assumptions, analyses, and findings.

CLATR Development Assumptions for Stage II

The objective of the CLATR is to develop recommendations to accommodate the level of travel activity generated by Sector Plan development. Exhibit 3 compares the current levels of housing units and jobs in the CBD with forecast levels for an assumed "end state" of Stage II. These forecast levels of development do not represent a zoning capacity, but rather a staff estimate of development patterns likely to occur over the next five to ten years.

Exhibit 3 indicates that the Bethesda CBD is estimated to have approximately 37,111 jobs, based on the land use inventory and reported 16% commercial vacancy rate at the end of June 2003. The vacancy rate reflects both the recent completion of 1.3 million square feet of commercial space that is not fully occupied as well as the effects of the current regional economy. Staff expects that absorption of the vacant commercial space to a 4% vacancy rate more typical of routine office turnover in a healthy economy would result in approximately 5,040 more jobs in the CBD. Staff assumes another 1,238 jobs are already in the pipeline based on recent approved or pending active development plans.

Currently there are approximately 6,091 residential dwelling units in the CBD. Another 1,858 units are considered to be in the pipeline.

Exhibit 3. Bethesda CLATR Development Assumptions

	Number of jobs					Number of DU		
CLATR Database	Office	Retail	Hotel	Other	TOTAL	SF	MF	TOTAL
Existing	32181	3104	1800	26	37111	310	5781	6091
Infill of vacant commercial space	4597	443	0	0	5040	0	0	0
Approved and Pending	152	1086	0	0	1238	60	1798	1858
Subtotal	36930	4633	1800	26	43389	370	7579	7949
Additional development (tested for Stage II)	7571	1715	0	21	9307	47	1483	1530
Less redevelopment of existing land uses	687	1015	74	10	1786	23	19	42
Net additional development	6884	700	-74	11	7521	24	1464	1488
Total, Stage II End-State	43814	5333	1726	37	50910	394	9043	9437

Notes for Status Report, 9/22/03
Existing job totals based on CBD land use inventory and reflect 16.0% vacancy rate.
Additional future job totals reflect assumed 4.0% vacancy rate.

Dwelling unit data based on CBD land use inventory.

AGP totals for 2003 households and jobs in Bethesda CBD are 6,326 and 39,667, respectively
Sector Plan suggests (p. 4 and p. 23/25) Stage II total households and jobs in 2010 would be 53,400 and 7,900

The additional development levels tested for Stage II represent a parcel-level review of CBD development potential, similar to the process performed for the 1994 Sector Plan. Staff estimates that new development consisting of approximately 9,307 jobs and 1,530 dwelling units will occur in the foreseeable future. Most of this new development will actually be redevelopment of underutilized parcels, so that roughly 1,786 jobs and 42 dwelling units currently "on the ground" will be redeveloped.

The net effect of the existing, approved and pending, and future net development increases results in Stage II end-state totals of 50,910 jobs and 9,437 dwelling units. For comparison purposes, the 1994 Sector Plan envisioned a Stage II end-state of 53,400 jobs and 7,900 dwelling units. The difference between the end-state assumptions described in the Sector Plan and those described in this memorandum reflect the increased emphasis on housing throughout the CBD, including the Woodmont Triangle area.

Note that throughout the CLATR, the forecasted Stage II end-state reflects the 50,910 total jobs. If the 5,000 job ceiling recommended by staff is established, the end-state would be adjusted to 48,389 jobs, or 5,000 more than the subtotal of 43,389 jobs associated with existing occupied space, infill of vacant space, and approved and pending developments.

Mode Share Goals

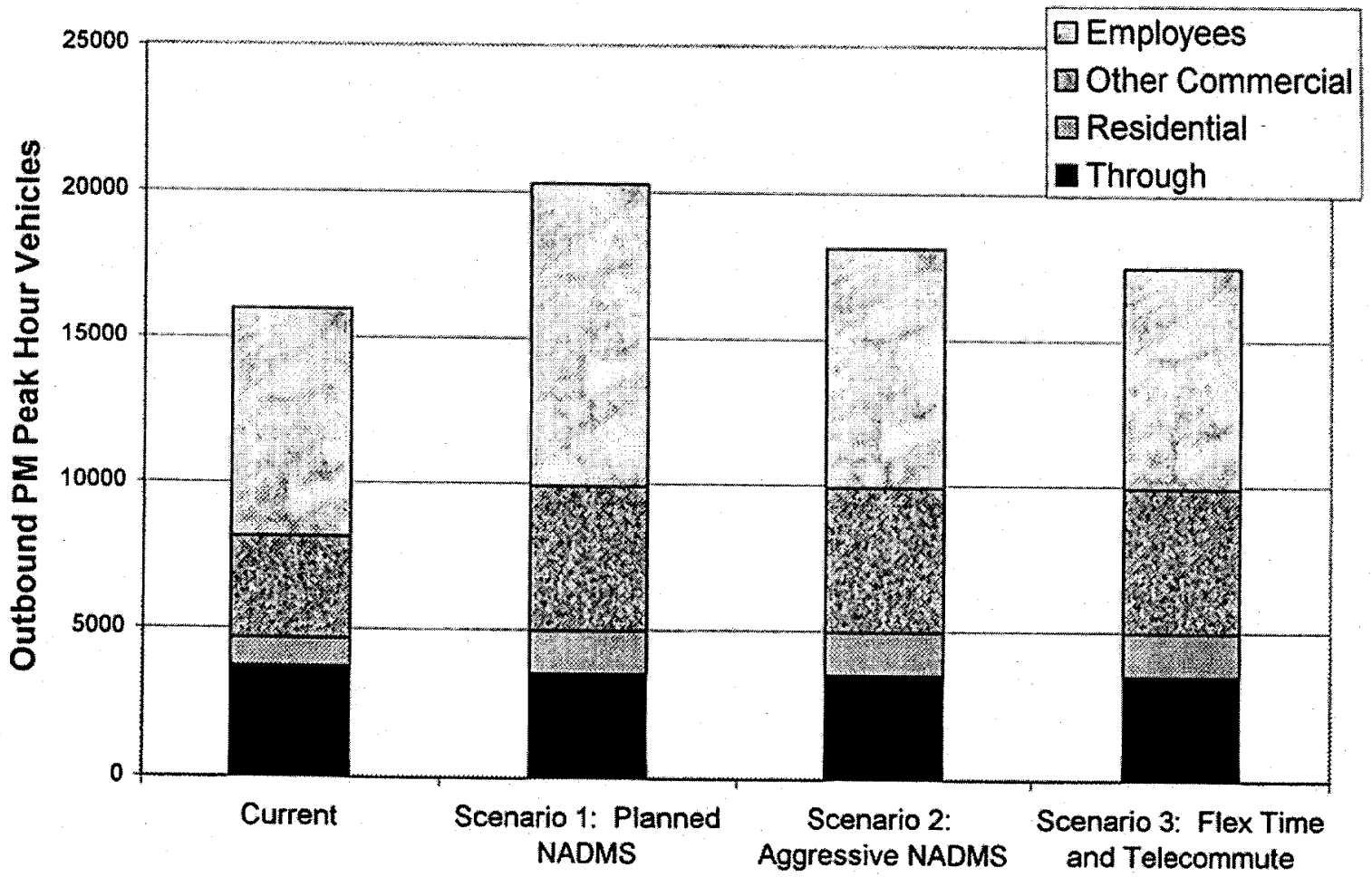
The CLATR reflects the current 34% NADMS for the 37,111 employees currently estimated to be working in the CBD. The Scenario 1 analysis assumes that the Sector Plan end-state goal of 37% NADMS will be achieved by all CBD employees. For the existing employees, the three percentage-point change in NADMS would remove approximately 360 peak hour vehicles from the CBD roadways.

The CLATR considered two additional scenarios to evaluate the sensitivity of far more aggressive TDM techniques on roadway congestion. In both cases the sensitivity test was performed to determine whether the congestion problems along Rockville Pike and Connecticut Avenue could be addressed solely through TDM techniques.

- Scenario 2 considered the application of a 50% NADMS to all CBD employees. The 50% NADMS is the current mode share goal in the Silver Spring CBD.
- Scenario 3 considered an emphasis on flex time and telecommute goals rather than on NADMS. Scenario 3 retained the Sector Plan 37% NADMS but assumed that the percentage of auto drivers traveling during the peak hour would be reduced from the current 40% to a more aggressive 30% and that the number of employees who telecommute on a given day would rise from the current 1% to 5%.

Exhibit 4 presents a comparison of existing, Scenario 1, Scenario 2, and Scenario 3 assumptions on the number of vehicles leaving the Bethesda CBD during the evening peak hour. The sensitivity analysis focuses on outbound traffic during the evening peak hour because this direction of travel during this time of day is the primary concern regarding unresolved congestion at the three intersections north and east of the CBD.

Exhibit 4. Evening Peak-Hour Volumes at Bethesda CBD Cordon Line



Each of the stacked bars shown in Exhibit 4 contains four components:

- **Through** describes vehicles leaving the CBD that did not originate from the CBD. Currently through travel accounts for approximately 23% of outbound CBD traffic. Under the levels of development tested in Scenario 1, regional travel demand models suggest that the number of through vehicles will decrease, but only slightly.
- **Residential** describes vehicles leaving the CBD that originate from housing units in the CBD. As previously described, residential development generally accounts for a relatively small proportion of CBD congestion.
- **Other Commercial** describes traffic generated by office, retail, and other commercial sites that represents trip purposes other than employees leaving their workplaces. Examples of "other commercial" trips include retail customers, office visitors, and deliveries. These trips are not affected by the NADMS mode share goals.
- **Employees** describe traffic generated by employees leaving office, retail, and other commercial sites at the end of the day. These trips account for roughly half of the vehicle trips leaving the CBD. The employee home-based-work trips are affected by the NADMS mode share goals. These trips are also assumed to be responsive to flex time and telecommute assumptions in Scenario 3.

As indicated in Exhibit 4, the number of peak hour vehicles leaving the Bethesda CBD is slightly more than 15,000. In Scenario 1, reflecting the Sector Plan NADMS, the peak hour vehicle trips increase by about one-third, to slightly more than 20,000. In Scenarios 2 and 3, the aggressive assumptions for mode share goals and flex time/telecommute options result in levels of CBD trip generation that are substantially lower than Scenario 1, but still higher than existing.

Exhibit 4 leads to the following conclusions:

- Employees in the Bethesda CBD remain the best "target audience" for TDM activities
- Increased levels of TDM are a valuable tool to reduce vehicular trip generation in the CBD
- Even if very aggressive TDM programs were pursued, the Stage II development would still result in traffic volumes greater than current levels.

Staff notes that both the mode share and flextime assumptions considered in Scenarios 2 and 3 are not likely to be pragmatic in the Bethesda CBD. While the flextime scenario reduces the traffic congestion during the peak hour, it essentially shifts traffic to adjacent times of day, an action which eventually resulting in longer time periods of congestion. Therefore, while flextime remains a valuable TDM tool, further pursuit of the 30% assumption tested in Scenario 3 would require evaluation of a longer analysis time period.

While the 50% NADMS scenario appears to be practical in the Silver Spring CBD, staff does not believe it would be achievable in the Bethesda CBD for two reasons. First, the Silver Spring CBD has a higher percentage of public sector employees than Bethesda, and the public sector has traditionally been more responsive to TDM techniques than the private sector. Second, while both CBDs are served by the Metrorail system, the Silver Spring CBD is also served by MARC

commuter rail and is the terminus for an extensive express bus system along US 29. The Silver Spring transit system therefore has the residual capacity to accommodate a greater number of riders than the Bethesda CBD transit system.

The Sector Plan recommends the implementation of the Silver Spring – Bethesda Trolley during Stage II. This important facility, subsequently called the Purple Line and then the BiCounty Transitway, is currently under study by the Maryland Transit Administration. The BiCounty Transitway is an integral element of the transportation plans for both Silver Spring and Bethesda. Staff analysis indicates that the implementation of the BiCounty Transitway as a light rail line on the master planned alignment between Silver Spring and Bethesda would increase transit mode shares in the Bethesda CBD by about one percentage point. The BiCounty Transitway, therefore, is a key element in attaining recommended mode share goals for the CBD, but it should not be considered a means for attaining the levels of NADMS observed in Silver Spring.

In summary, staff believes that further pursuit of additional TDM measures in the Bethesda CBD remains essential. However, additional TDM measures are not the solution to the immediate discussion at hand, however, as the forecasted intersection congestion problems on Wisconsin Avenue and Connecticut Avenue are only indirectly linked to the TDM assumptions.

Areawide Level of Service

The AGP defines area-wide level of service according to the Average Congestion Index (ACI). The ACI reflects the average volume-to-capacity ratio for all roadways in the policy area, weighted by vehicle travel. For evaluation of ACI, the AGP defines the Bethesda CBD as part of the Bethesda / Chevy Chase Policy Area. The relevant ACI figures for the Bethesda / Chevy Chase Policy Area are as follows:

- The current AGP **standard** for the Bethesda / Chevy Chase Policy Area is an ACI of 0.73.
- The base year (1998) conditions result in an ACI of 0.57
- The forecast Stage II conditions result in an ACI of 0.65

As previously stated, the areawide level of service meets the applicable ACI standard, fulfilling the sixth staging objective.

Intersection Levels of Service

The CLATR process includes a Local Area Model to perform the trip generation, trip distribution, modal split, and traffic assignment functions associated with a Local Area Transportation Review study. Intersection congestion is measured by comparing the Critical Lane Volume (CLV) at each intersection against the applicable AGP congestion standard. In the Bethesda CBD, the congestion standard is a CLV of 1800. In the Bethesda / Chevy Chase Policy Area the congestion standard is currently a CLV of 1650, although that standard will be revised to 1600 effective July 1, 2004. The lower standard of 1600 was therefore considered in the CLATR.

The degree by which intersections achieve or fail to achieve the congestion standard is described as the volume-to-capacity, or V/C ratio. CLV values are calculated for both morning and evening peak hours at each intersection. The intersection V/C ratio is calculated by dividing the higher (or more congested) of the morning and evening CLV values by the congestion standard. A V/C ratio below 1.0 indicates that the intersection meets the congestion standard criteria for both morning and evening peak periods. A V/C ratio above 1.0 indicates that the intersection does not meet the congestion standard for either or both the morning and evening peak periods.

The CLATR examined intersection congestion at 32 key intersections. Twenty of the intersections are within the Bethesda CBD and the remaining 12 intersections are in the Bethesda/Chevy Chase policy area. The CLATR documents levels of service for three scenarios:

- Existing conditions (reflecting the observed 34% NADMS)
- Stage II end-state conditions with a 37% NADMS for all CBD employees and programmed transportation improvements (Scenario 1)
- Stage II end-state conditions with a 37% NADMS for all CBD employees and programmed transportation improvements plus additional improvements considered to address forecasted intersection congestion levels notably higher than current standards. (Scenario 1A)

Exhibit 5 provides a table of existing and forecast intersection CLVs and V/C ratios for the three scenarios described above, listed in descending order of Scenario 1 V/C ratio. Currently, five of the 32 intersections fail to meet applicable congestion standards. The two intersections with the highest V/C ratios (approaching 1.50) are along Wisconsin Avenue / Rockville Pike at Jones Bridge Road and Cedar Lane. During the evening peak period, the observed CLV values at both intersections approach 2400; among the highest observed CLV values in Montgomery County and indicative of the true physical capacity of the intersection (as opposed to the design capacity reflected in the congestion standards).

In Scenario 1, fifteen of the 32 intersections have a forecasted V/C ratio greater than 1.0. Several programmed intersection improvements are reflected in this scenario, including the additional turn lanes at Wisconsin Avenue and Jones Bridge Road described in the current CIP and the additional turn lane at Connecticut Avenue and East-West Highway being implemented by the State Highway Administration.

Scenario 1A includes the effects of additional geometric improvements at the intersections with V/C ratios greater than 1.0 in Scenario 1. Exhibit 6 identifies the location of the study intersections within the CBD and their status regarding Scenario 1A improvements. Exhibit 7 provides the same information for intersections in the Bethesda / Chevy Chase policy area. A complete list of the improvements considered is included in Attachment C on Pages Circle 10 and 11.

Exhibit 5. Bethesda CLATR Intersection CLV and V/C Ratio

Intersection Name	Congestion Standard (after 7/1/04)	Existing CLV AM	Existing CLV PM	Existing CLV Worst V/C	Scenario 1 CLV AM	Scenario 1 CLV PM	Scenario 1 CLV Worst V/C	Scenario 1A CLV AM	Scenario 1A CLV PM	Scenario 1A CLV Worst V/C
Rockville @ Cedar	1600	2131	2391	**1.49**	2274	2643	**1.65**	master planned interchange		
Wisconsin @ Bradley	1800	1564	1432	0.87	2614	1616	**1.45**	1671	1476	0.93
Bradley @ Wilson	1600	1404	1475	0.92	2009	2268	**1.42**	1429	1588	0.99
Rockville @ Jones Bridge	1600	1509	2360	**1.48**	1594	2144	**1.34**	further study needed		
Connecticut @ Jones Bridge	1600	1672	2006	**1.25**	1708	2093	**1.31**	further study needed		
Connecticut @ East West	1600	1737	1655	**1.09**	1898	1878	**1.19**	further study needed		
Old Georgetown @ Cedar	1600	1358	1639	**1.02**	1532	1880	**1.18**	1382	1667	**1.04**
Bradley @ Huntington	1600	980	1321	0.83	1340	1824	**1.14**	1340	1647	**1.03**
Wisconsin @ East West	1800	1398	1318	0.78	1743	2039	**1.13**	1457	1807	**1.00**
River @ Little Falls	1600	1484	1537	0.96	1614	1808	**1.13**	1564	1660	**1.04**
Rockville @ Wilson (NIH)	1600	1231	1574	0.98	1374	1805	**1.13**	1357	1474	0.92
Wisconsin @ Woodmont	1600	979	1389	0.87	1248	1756	**1.10**	1033	1547	0.97
Wisconsin @ Montgomery	1800	1136	1489	0.83	1780	1925	**1.07**	1676	1792	1.00
Old Georgetown @ Arlington	1800	1388	1637	0.91	1844	1894	**1.05**	1810	1697	**1.01**
Arlington @ Elm	1800	863	1220	0.68	1275	1842	**1.02**	1275	1589	0.88
Old Georgetown @ Battery	1800	1192	1325	0.74	1346	1758	0.98			
Bradley @ Arlington	1800	1057	1146	0.64	1500	1649	0.92			
Woodmont @ Bethesda	1800	691	924	0.51	1343	1559	0.87			
Old Georgetown @ Beech	1600	1290	1176	0.81	1377	1322	0.86			
Wisconsin @ Waverly	1800	861	1074	0.60	1230	1528	0.85			
Woodmont @ Battery	1800	1097	1083	0.61	1463	1464	0.81			
Waverly @ Montgomery	1800	703	1051	0.58	1133	1437	0.80			
Bradley @ Goldsboro	1600	740	1091	0.68	917	1258	0.79			
Pearl @ East West	1800	1104	899	0.61	1393	1253	0.77			
Arlington @ Bethesda	1800	841	1039	0.58	1201	1338	0.74			
Pearl @ Montgomery	1800	655	1046	0.58	801	1309	0.73			
Bradley @ Leland	1800	752	875	0.49	1237	1026	0.69			
Wisconsin @ Bethesda	1800	968	929	0.54	1198	1192	0.67			
Wisconsin @ Battery	1800	858	785	0.48	1181	1166	0.66			
Waverly @ East West	1800	847	694	0.47	959	1145	0.64			
Woodmont @ Cordell	1800	790	873	0.49	935	1102	0.61			
Woodmont @ Montgomery	1800	396	461	0.26	488	701	0.39			

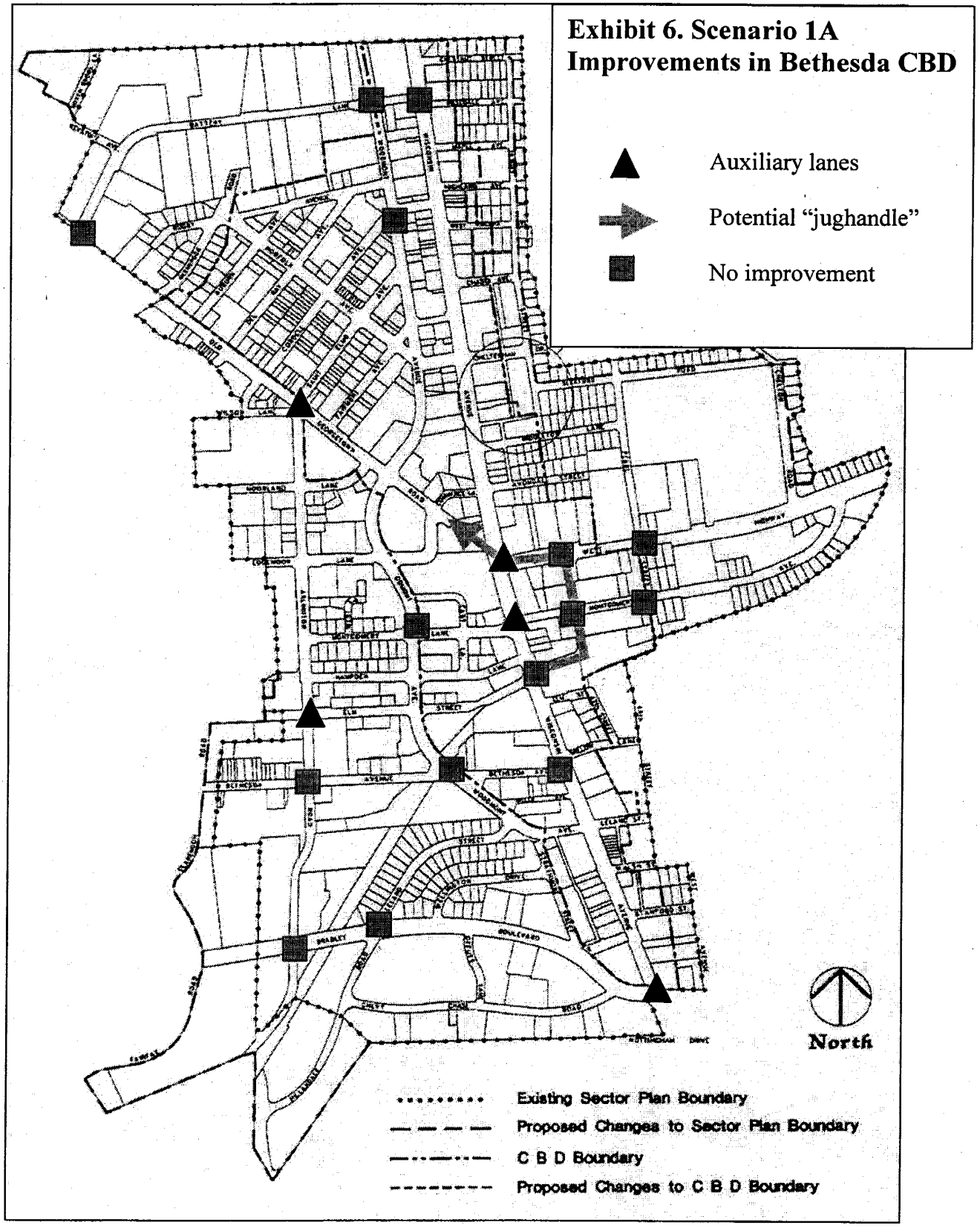


Exhibit 6. Scenario 1A
Improvements in Bethesda CBD
Auxiliary lanes
Potential "jughandle"
No improvement
North
Existing Sector Plan Boundary
Proposed Changes to Sector Plan Boundary
C B D Boundary
Proposed Changes to C B D Boundary

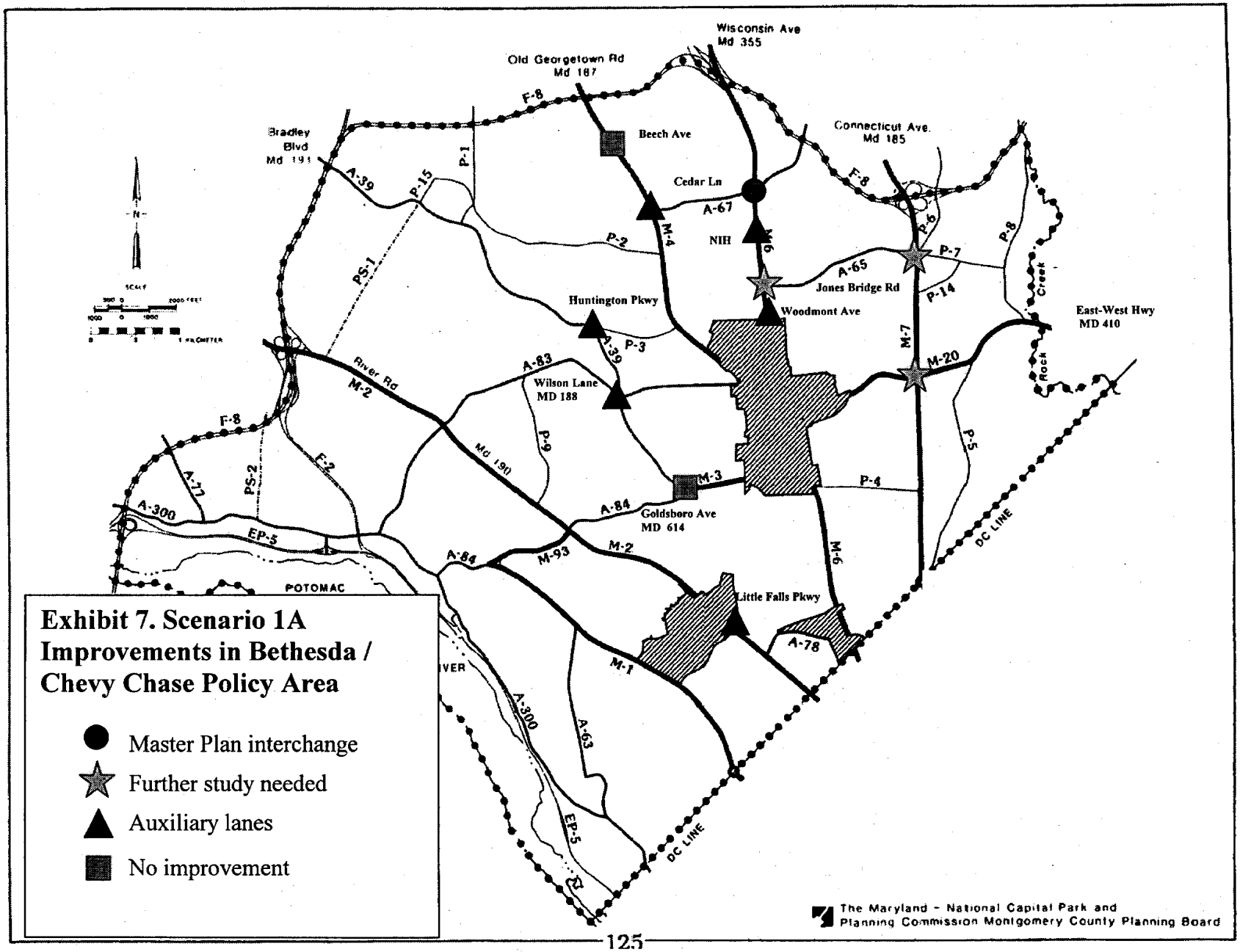


Exhibit 7. Scenario 1A Improvements in Bethesda / Chevy Chase Policy Area

- Master Plan interchange
- Further study needed
- Auxiliary lanes
- No improvement

The Maryland - National Capital Park and Planning Commission Montgomery County Planning Board

The improvements described in Scenario 1A are generally consistent with the applicable master plan recommendations for roadway right-of-way and number of through travel lanes. Scenario 1A improvements are considered to be generally feasible from a sketch-level planning perspective and generally effective in addressing vehicular congestion. As indicated in Exhibit 5, staff identified improvements at locations with a Scenario 1 V/C ratio above 1.0. Staff applied judgment in evaluating effective improvements, and did not include improvements that would be required to precisely meet the congestion standard for this planning study if a lesser improvement came close to meeting the standard. Furthermore, for intersections within the Bethesda CBD the current AGP allows intersections to exceed the 1800 CLV congestion threshold if a queuing analysis demonstrates that upstream intersections are not adversely affected. Therefore, at five locations, the Scenario 1A V/C ratio is between 1.00 and 1.05 rather than less than 1.0.

The inclusion of a geometric improvement in Scenario 1A is not a staff endorsement of the improvement. At each location, further study will be needed during Stage II to determine whether or not the improvement is cost-effective. Similarly, it is possible that, during Stage II, improvements will be warranted at intersections other than those identified in Scenario 1A. The development of Scenario 1A provides guidance to the development community and the public sector agencies regarding locations where future congestion is expected and a general sense of the order of magnitude of improvements that might be considered during Stage II. Any actual improvements will require further planning, design, and implementation through either development plan approvals or public sector facility planning and engineering studies.

The remaining paragraphs describe the types of improvements considered in Scenario 1A. The intersections are grouped by geographic area, generally described in decreasing order of concern.

Wisconsin Avenue / Rockville Pike North of the CBD

The Wisconsin Avenue / Rockville Pike intersections with Jones Bridge Road and Cedar Lane both currently exceed applicable congestion standards and are not likely to be "solved" with an at-grade solution. The 1990 Bethesda / Chevy Chase Master Plan recommends a grade-separated interchange at the Rockville Pike intersection with Cedar Lane. A similar approach is likely to be needed at the Jones Bridge Road intersection.

The CIP Project No. 500140 describes the addition of a second southbound left turn lane to Rockville Pike and a third westbound left turn lane to Jones Bridge Road. These improvements would reduce the evening CLV at the intersection from 2360 to 1889, still higher than the CLV standard of 1600 (effective July 1, 2004). During County Council worksessions this spring the proposed southbound left turn lane on Rockville Pike has been removed from the project description due to federal facility security concerns. Further at-grade improvements beyond those described in the CIP project PDF would require adding additional through travel lanes to Rockville Pike/Wisconsin Avenue.

The intersection of Rockville Pike at Wilson Drive (NIH entrance) currently operates at acceptable levels of congestion but has a Scenario 1A forecast V/C ratio of 1.13. At this location, the congestion could be addressed by adding a second approach lane on Wilson Drive.

The presence of the federal campuses of the National Institutes of Health and the Naval Medical Center on either side of Rockville Pike provide both opportunities and constraints in addressing congestion in this corridor. Opportunities include federal agency interest and resources in improving both campus access and security and the potential to consider substantial changes to campus traffic patterns. Constraints include homeland security concerns and the desire on the part of all agencies to retain a boulevard character along Rockville Pike as described in the 1990 Bethesda / Chevy Chase Master Plan and reiterated in the 2001 Legacy Open Space Master Plan.

The intersection of Woodmont Avenue at Wisconsin Avenue currently operates at acceptable levels of congestion but has a Scenario 1 forecast V/C ratio of 1.10. At this location, the congestion could be addressed by re-striping the Woodmont Avenue approach so that left turns are allowed from all three approach lanes.

Connecticut Avenue Northeast of the CBD

The Connecticut Avenue intersections with Jones Bridge Road and East-West Highway both exceed current applicable congestion standards and are not likely to be "solved" with at-grade solutions.

The intersection of Connecticut Avenue with Jones Bridge Road is actually a five-legged intersection with Kensington Parkway as the fifth leg in the northeast quadrant. This intersection has been the subject of substantial discussion associated with the Chevy Chase Lake East subdivision in the southeast quadrant, the Howard Hughes Medical Institute special exception in the southwest quadrant, and the Jones Bridge Road busway option to the BiCounty Transitway. In the case of both development projects, alternative turn lane improvements were considered but ultimately the geometric improvements were found to be more disruptive than accepting the substandard congestion levels. The Maryland Transit Administration staff suggested that a grade-separation at this location would be necessary to implement a Jones Bridge Busway and that the grade-separation might be desirable even without the busway component.

The Maryland State Highway Administration is currently implementing a second eastbound left turn lane on East-West Highway at Connecticut Avenue. This improvement will reduce the morning CLV from 1737 to 1664, essentially meeting the current congestion standard of 1650. The CLV remains higher, however, than the revised congestion standard of 1600 that takes effect as of July 1, 2004. In the evening, the second left turn lane will greatly improve traffic operations for vehicles leaving the Bethesda CBD by reducing vehicular delays and improving vehicular queuing. The second left turn lane will not, however, reduce the intersection CLV (currently at 1655) because the eastbound through traffic volume, not the left turn volume, is the critical movement on the eastbound approach during the evening.

Old Georgetown Road at Cedar Lane

The intersection of Old Georgetown Road at Cedar Lane currently operates at acceptable levels of congestion, although the PM CLV of 1639 exceeds the new 1600 CLV standard that will go into effect on July 1, 2004. The forecasted Scenario 1A V/C ratio of 1.18 could be addressed by the addition of an exclusive northbound right turn lane on Old Georgetown Road and a second westbound left turn lane on Cedar Lane.

Wisconsin Avenue at East-West Highway and Montgomery Avenue

The intersection of Wisconsin Avenue at East-West Highway is generally considered to be the "100 percent" corner of the Bethesda CBD. East-West Highway and Montgomery Avenue form a one-way pair for east-west travel across Wisconsin Avenue. Traffic traveling west along East-West Highway continues on to Old Georgetown Road as it crosses Wisconsin Avenue. The East-West Highway and Montgomery Avenue intersections are closely spaced, approximately 400 feet apart, and operate in tandem.

Currently, both intersections operate within the 1800 CLV congestion standard of the Bethesda CBD. In Scenario 1, both intersections are forecast to exceed the congestion standard during the evening peak hours with V/C ratios of 1.13 at East-West Highway and 1.07 at Montgomery Avenue.

Several options exist for addressing the forecasted congestion at these two locations:

- The current AGP allows CLVs in Metro Station Policy Areas such as the Bethesda CBD to exceed the 1800 CLV if a subsequent queuing analysis indicates that vehicle queues will not adversely affect operations at upstream intersections. Therefore the forecasted Scenario 1 V/C ratios slightly above 1.0 may prove to be acceptable throughout Stage II.

- Intersection widening to provide an additional northbound lane on Wisconsin Avenue between Montgomery Avenue and East-West Highway and an additional eastbound lane on Montgomery Avenue between East Lane (a block west) and Wisconsin Avenue would provide several benefits but have several adverse impacts. The primary benefit would be that a fifth approach lane on northbound Wisconsin Avenue at East-West Highway would allow the elimination of the shared through-left turn lane (by establishing two exclusive left turn lanes and three exclusive through lanes). This improvement, in turn, would allow the "split" phasing on Wisconsin Avenue at this location to be removed, likely resulting in more efficient vehicular operations and a longer walk signal phase for pedestrians crossing Old Georgetown Road. The adverse effects, however, would be a net reduction in sidewalk widths by approximately 11 feet at this key location and restricted parking on Montgomery Avenue east of Wisconsin Avenue. Therefore, this option, while described in the Scenario 1A materials, is likely not desirable.

- Establishment of a "jughandle" left-turn treatment using Waverly Street for left turns from northbound Wisconsin Avenue to Old Georgetown Road. Currently, about 500 vehicles make this left turn in the evening peak hour and the forecasted Scenario 1

demand for the movement is expected to be above 800 vehicles per hour. Evening peak period congestion could be relieved if the left turns onto Old Georgetown Road were prohibited and redirected instead to turn right onto Waverly Street and then left onto East-West Highway. This jughandle concept would remove sufficient vehicles from critical movements at both intersections to reduce the V/C ratio below 1.0 without causing intersections along the jughandle route to exceed a V/C ratio of 1.0. If this concept were implemented full time, the one exclusive left turn lane on Wisconsin Avenue at Old Georgetown Road could conceivably be converted to expand the pedestrian refuge area in the median. The primary drawback to this jughandle concept would be the introduction of several hundred vehicles per hour on Waverly Street, roughly doubling its projected traffic volume. Coordination with State Highway Administration would be critical to address the adequacy of this alternate route for a connection between two state highways.

Wisconsin Avenue at Bradley Boulevard

This intersection serves as the southern gateway to the CBD along Wisconsin Avenue. Currently the intersection operates at acceptable levels of congestion. This intersection, however, experiences the greatest increase in V/C ratio between current levels and Scenario 1 levels, with a projected V/C ratio of 1.45 in Scenario 1. The increase is due primarily to two factors:

- Substantial development potential exists at the southern end of the CBD
- Limited alternate routes are available into the CBD from the south

Programmed intersection improvements have recently been completed at this intersection implementing a northbound left turn lane that will ultimately allow the removal of the "split phase" on Wisconsin Avenue. Improvements considered in Scenario 1A include the addition of dual left turn lanes on the northbound Wisconsin Avenue and eastbound Bradley Boulevard approaches and a second through lane on westbound Bradley Boulevard. These improvements would require property acquisition but would be achievable within the master planned right-of-way recommendations in the current Bethesda CBD and Bethesda / Chevy Chase plans. If forecasted intersection congestion is not addressed through capacity improvements at this location, through traffic volumes would likely increase on Leland Street and Arlington Road.

Arlington Road

The Scenario 1 V/C ratios on Arlington Road exceed 1.0 at two locations: Elm Street and Old Georgetown Road. At both locations, the current V/C ratios are less than 1.0 and the Scenario 1 V/C ratios are less than 1.05. As described above, staff considered a V/C ratio of 1.05 an acceptable objective for Scenario 1A considering the precision of the forecasting tools and the AGP guidance that intersections in the CBD can exceed an 1800 CLV if a queuing analysis demonstrates acceptable operations.

Two relatively minor improvements on Arlington Road are described in Scenario 1A. At Elm Street, a westbound left turn lane would need to be added to achieve a V/C ratio below 1.0. This improvement might be achieved simply through re-striping of the existing pavement. At the

northern end of Arlington Road, a separate right-turn lane on the approach to Old Georgetown Road is included.

Bradley Boulevard West of the CBD

The Bradley Boulevard intersections with Wilson Lane and Huntington Parkway both currently operate at acceptable levels of congestion but have Scenario 1 forecasted V/C ratios greater than 1.0. At Wilson Lane, the Scenario 1A improvement considered would be to widen Bradley Boulevard to create an auxiliary through lane in each direction through the intersection with Wilson Lane, tapering back to the existing two lane roadway on either side of Wilson Lane. At Huntington Parkway, the Scenario 1A improvement considered would be to add an exclusive right turn lane on northbound Bradley Boulevard. In both cases the improvement could be implemented within the existing right-of-way.

River Road and Little Falls Parkway

The intersection of River Road and Little Falls Parkway currently operates at acceptable levels of congestion but has a forecasted Scenario 1 V/C ratio of 1.13. At this location, the forecasted congestion levels can be addressed by re-striping the southbound approach to convert the shared through-left lane into a through lane only (thereby limiting left turns to the one exclusive left turn lane) and removing the "split phase" on Little Falls Parkway.

DW:kcw
Attachments

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mmo to mcpb bethesda staging.doc